accession 21858

United States Circuit Court,

SOUTHERN DISTRICT OF NEW YORK.

AMERICAN BELL TELEPHONE COMPANY ET AL.

v.

THE PEOPLE'S TELEPHONE COMPANY ET AL.

ARGUMENT OF J. J. STORROW, Esq.,

FOR COMPLAINANTS.

BOSTON:
ALFRED MUDGE & SON, LAW PRINTERS, 24 FRANKLIN STREET.
1884.

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United States Circuit Court,

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IN EQUITY.

AMERICAN BELL TELEPHONE COMPANY ET AL.
v.
PEOPLE'S TELEPHONE COMPANY ET AL.

BEFORE HON. WILLIAM J. WALLACE, *Circuit Judge.*

ARGUMENT OF J. J. STORROW, ESQ.

NEW YORK, Sept. 22, 1884.

May it please your Honor: The record in this case is on your Honor's table. It consists of several volumes, and perhaps I had better state what they are, so that you can find your way through them.

The bill was sworn to Oct. 9, 1880, and filed Oct. 20, 1880.

The answer was filed on Jan. 6, 1881, and the complainants took their *prima facie* proofs soon after that time. They consist simply of the patents, proof of infringement, etc. They are bound in the first volume of *Complainants' Proofs.* The first one hundred pages of it comprise the complainants' *prima-facie* case. Then the defendants took testimony at or near Harrisburg, for the purpose of proving the history of Drawbaugh's alleged prior invention. That was their testimony as to the invention. That testimony is contained in two volumes, and, together with some expert testimony as to Mr. Bell's patent, makes their case in chief. The two volumes are marked, "Defendants' Proofs," Volumes I and II, comprising 1314 pages, and include 127 depositions, cited as *defts, i,* and *defts, ii.*

Then the complainants took their testimony in reply, chiefly relating to the Drawbaugh matter, but also somewhat relating to Mr. Bell's invention. That testimony is bound up in continuation of complainants' *prima-facie* case, making, with that, two volumes of 1741 pages, cited as *complts, i,* and *complts, ii.* The complainants' two volumes, I and II, contain their *prima-facie* case, and also contain their evidence in reply (the body of their proof in reply relating to Drawbaugh); and, between those two, there is sandwiched in the defendants' proofs in chief (*defts, i,* and *defts, ii*) in the two volumes before your Honor. After that proof was completed, then the defendants went on and took testimony in what is called their surrebuttal. It makes one thick volume of 1140 pages, including 199 depositions cited as *defts, iii.* Then the complainants took testimony in rejoinder. Your Honor will find the volume marked, "Complainants' Testimony in Rejoinder and Closing Proofs," cited as *complts, iii.* Fifty witnesses were examined in the complainants' rejoinder. On defendants' surrebuttal, there were two hundred and thirty-eight witnesses. Then the complainants' rejoinder, as we call it, comprising about fifty witnesses. After that was completed, the defendants began again, and took thirty-seven more depositions in what they called a surrejoinder; and you will find that testimony in their volume iv (*defts, iv*). After that was completed, the complainants examined eighteen witnesses, making what is called the *Closing Proofs,* which you will find bound in the same volumes with our rejoinder (*complts, iii*). After that, the defendants began again and took two depositions, which closed the case.

The complainants' proofs and testimony, therefore, consist, first, of Vols. I and II, which contain the *prima-facie* case, and the body of our reply on the Drawbaugh issue. Then a third volume (*complts, iii*), which contains our rejoinder and our closing proofs. Then there is a fourth volume, the thickest volume of all, containing the complainants' exhibits (cited *complts, iv, exhibits*).

The defendants' proofs consist of two volumes of 1340 pages, paged consecutively, and containing the body of their proofs in chief, namely, the testimony of one hundred and twenty-eight witnesses (*defts, i* and *ii*). Then comes the defendants' surrebuttal, containing 1140 pages, and comprising the testimony of one hundred and ninety-nine witnesses, cited as *defts, iii, surbtl.* Then a surrejoinder and closing proofs cited as *defts, iv.* They also have a volume of exhibits. They are bound up separately.

There are in these eight or nine octavo volumes 6446 printed pages. It was a matter of some embarrassment to know what kind of brief it was desirable to add to those volumes, in order not to override the Court with too much of a brief on the one hand, and on the other hand not to expect the Court to learn those volumes by heart, in order to understand their contents. We have followed what I may call a double-barrelled method. We have made two briefs, the first of thirty pages, containing substantially the essence of the case as we understand it. We have considered that it was the function of the oral argument to present to the Court our views of the cause in such a way that the Court might understand them. We thought that a proper supplement to the argument was a long brief, which should be divided up in such a way that by a table of contents and otherwise, the Court could refer to different parts of it, and where we could collect together, under different heads, not merely slight references to the general character of the argument which we thought that the facts warranted, but collect together references to the record, with very full quotations from the testimony, in order that the Court might thus have each particular point brought together in one book, in a convenient way, together with a reference or quotation of most of what each point needs to refer to, and an easy way of finding out the rest. We did not then think that we had done all that we ought, in order to facilitate the labors of the Court.

There were five hundred and thirty-five witnesses examined in this case. It would be impossible in any brief of reasonable length to bring in the testimony of all of them. We have, therefore, in addition to our brief, made an abstract of each one of these depositions. After an abstract of each deposition, and along with it, we have printed abstracts of certain other depositions, or of the parts of them which bore directly on the evidence of each particular witness. Of course, in considering the testimony of each particular witness, we have not undertaken to argue the case, and to show that the weight of the testimony was enough to overthrow it or otherwise; but we have brought together with the abstract of the deposition of each witness, extracts from others, which particularly or specifically bore upon him, as distinguished from other witnesses. We have done all this, not simply by stating what we understand to be the sum, substance, and effect of the witness's testimony, but wherever the language of the witness seemed to be in any way material, we have quoted it, to the end that the Court might have it all on the brief. We believe that three fourths of those witnesses are immaterial to the case, but that is a matter which the Court has to consider for itself. The volume which your Honor has in your hand is that abstract. Prefixed to it is an alphabetical list of the witnesses, so that when any witness is named, you can turn at once to that witness and find what particularly pertains to his testimony. We have thought it better to prepare this abstract with considerable fulness, knowing that what you do not want to read, you can omit, rather than give you insufficient means of information.

This case is a contest for the possession of the electric speaking telephone. It is a contest for the control, by patents, of the art of transmitting speech by electricity. Although the case does not turn upon any nice consideration of the question of infringement, or any nice consideration of what the precise apparatus is, nor its mode of operation, it is thought to be useful, at the outset, to state to your Honor somewhat at length, just what the speaking telephone is, what the invention that these parties are fighting for is, and how it transmits speech.

The COURT. Will you kindly give me the date of your application for the patent?

Mr. STORROW. Alexander Graham Bell's speaking telephone patent is dated March 7, 1876, No. 174,465. The application was filed Feb. 14, 1876. The patent was granted in the spring of the Centennial year, and the invention was exhibited at the Centennial, under circumstances which I will presently state. Perhaps I should say in this connection, that there are two patents. The principal one was issued on the date stated, and there is a second one, for improvements in the apparatus, dated Jan. 30, 1877, No. 186,787. That is also involved in this litigation. The application for that patent was made Jan. 15, 1877.

The defendants have no patent. They made an application, as the answer states and as the evidence shows, on July 22, 1880, but there has been no action, so far as appears in the record, by the Patent Office upon that application.

Now I come to a consideration of the question of what the telephone is, the title to which is in dispute before your Honor.

The telephone is a contrivance for transmitting speech by electricity. It does not transmit it in a way that a speaking tube does; it does not transmit it in a way that speech is transmitted through the air. When I speak, and somebody listens at a distant corner of the room, everybody within reach of my voice, between me and the listener, hears the same thing; but when I speak by telephone from here to the next town, the intervening persons hear nothing. It does not transmit in the way in which speech is transmitted mechanically across the room or through a speaking tube.

Everybody knows, for it is schoolboy learning, that sound is caused by vibrations of the air. It is transmitted by the propagation of those vibrations from one particle of air to the next. When a person speaks, his vocal organs agitate the air and set it in vibration; vibrating thus, they make the particles of air in contact with the vibrating vocal organs move in the same way. Each moving particle of air pushes and pulls the next, and that the next, and that the next, and so on, until they come to those particles that are next to the listener's ear, and they pull and push the drum of his ear, and thus excite in him the sensation of sound. The sensation of sound which he perceives and is conscious of is due to those vibrations; it therefore necessarily follows, and is the fact, that the kind of sound he hears, the kind of sensation which he experiences, depends upon the kind of vibration which produces the effect. One set of vibrations will produce one sensation, and another set of vibrations will produce another sensation; just as a peach, or a pear, or a glass of wine produces different sensations in the mouth.

Now, as everybody knows, the vibrations of the air particles, which produce the sound in the first place, take place in lines radiating from the source of sound, in lines between the source of sound and the listener's ear. These vibrations are, however, extremely minute, perhaps the five hundred-thousandth of an inch, perhaps less. It is also familiar knowledge that the length of the path which the air particles move over as they vibrate to and fro, or what is called the amplitude of the vibration, determines the violence of the sensation produced on the listener's ear; the more ample the vibration, the more powerful will be the sensation produced on the ear of the listener, that is, the louder will be the sound. It is also familiar knowledge that the time occupied in performing any one vibratory movement (which in the case of my voice is perhaps only the two-hundredth of a second) is what determines the pitch of the sound. If instead of moving and performing its vibration to or fro in the two-hundredth of a second, the air particle occupies the four-hundredth of a second, the sound will have a higher pitch; and so on in proportion. But that is not all. Everbody knows, experimentally, and from boyhood, that you may change the pitch of your voice, but the listener will understand what you say just as well, and will understand every word. If, for instance, I pronounce the word "yes," and then pronounce it again, with my voice raised to a higher pitch, you do not understand the word "no" the second time, but you understand "yes" as before. If I pronounce the word "yes" in a low tone, and again in a loud tone, the listener hears the same word, although he distinguishes that at one time it is spoken in a low tone, and the other time in a loud tone. If I am listening at a distant station, and hear the word "yes," as distinguished from the word "no," and recognize what it is, there is something different from loudness, something different from pitch, which determines to my ear which word is spoken. If I simply produce a sound of the same loudness, it may be another word. If I simply produce a sound of the same pitch, it may be another word. On the other hand, I may produce a sound which excites in the hearer the sensation of a particular word, and that sound may be a louder or a fainter sound, and may be of a higher or lower pitch. If I am to produce at the ear of the listener, at a distance, the sensation of the word "yes," I must do something besides controlling the loudness of the sound, and I must do something besides controlling the pitch of the sound he hears. What is it?

When the air particle is vibrating to and fro, between the speaker's vocal organs and the listener's ear, if I assume that at a given time it is to vibrate with a certain amplitude, that is, is to pass over a path of a certain length, then that amplitude will control the loudness of the sound at the ear of the listener. Now, assume that it is to do that in a certain period of time, say in the two-hundredth of a second; that length of time will control the pitch. Everybody knows that the amplitude of the vibration, that is, the loudness of a sound, may be varied without varying the pitch; or that the pitch may be varied without varying the loudness. But we know that neither change of pitch merely, nor change of loudness merely, will alter the word "yes" to the word "no." What then is it? It is perfectly easy to conceive that these air particles, in vibrating to and fro, each communicating its motion to the next, and that to the next, and so on until the disturbance reaches the listener's ear, may, although passing over a path of a definite length and in a definite period of time, perform the journey in different ways. The particle might start (if it had no inertia) at a full speed, and maintain a uniformity of speed to the end. Or it may start slowly and accelerate its speed, and then slow down as a pendulum does to the rate at which it started. It may move as the monkey of a pile-driver does, going in one direction uniformly, and in the other at accelerating speed. Or it may move at first fast, then slower, then faster again, and then slower. It may move as a trip-hammer does, and in various other ways. It is *the way in which the air particle performs its journey*, while passing from one end of its path to the other, that determines what the sensation of sound, at the listener's ear, shall be in respect to the distinction between words. When the air particle passes to and fro, over a path of a certain length, in a certain time, if it performs its journey in one way, it produces one sensation on the listener's ear. If it performs its journey in another way, it pulls and pushes a little differently on the listener's ear, and excites in him another and a different sensation, the sensation of a different word. This, which we may call the manner in which the air particle performs the vibration, or the mode of its vibration, irrespective of the length of the journey or of the time employed, constitutes what is called the "*form*" of its vibration. The way in which it performs its journey, irrespective of the length of the journey or of the time taken to pass over the whole, is the cause of what we call the "*quality*" of the sound. "*Quality*" of sound is the name applied to that which enables the ear to distinguish between one word and another word, if both words are spoken with the same loudness and in the same pitch. It is that which enables the ear to distinguish between a violin, and a flute, and the human voice, when they all sound a note of the same pitch and with the same loudness. If, therefore, I am to produce upon the ear of the listener at a distant station the sensation of the particular word "yes" instead of "no," it is not enough for me to produce a sound of a certain loudness; it is not enough for me to produce a sound of a certain pitch, but I must produce a sound of the right "*quality*" for the desired word. As I propose to do that in a telephone, not by bringing the listener within ear-shot of me, but by exciting at a distant station, by means of mechanism to be hereafter described, the air vibrations which are in turn to excite his ear, I must produce there, air vibrations which, not in amplitude merely (that is, loudness), nor in mere frequency, that is, in the time occupied by each total vibration (that is, in pitch), but which, in their *character and mode of vibration*, shall correspond with the particular word that I wish him to hear and understand.

Again, the Court can readily understand that if an air particle is performing its motion in a particular way, that motion may be compressed into a smaller compass of space, and still have its characteristic mode of travelling preserved. It may also be compressed into a shorter time or extended into a longer time, and still have its characteristic mode of travelling preserved. That, interpreted into sound, means simply that the same word and the same *quality* of sound may be preserved, although the voice may be louder or be higher pitched. In the same way, if a speaking telephone should produce a sound at a distance which had the requisite *quality* or character, it would be of very little consequence if it was not so loud, so long as it was loud enough to be heard. That is what takes place in every telephone. The sound at the receiving station is not so loud as the sound made at the transmitting station. Even if the pitch were changed, that would be immaterial, although, as matter of fact, in a telephone the pitch is preserved unchanged.

How is this to be done by mechanism?

When I speak to a person across the room, the listener at the distant station hears, because the vocal organs of the speaker, vibrating in a peculiar way, compel the air particle next to them to vibrate in a certain way; that in turn pushes or pulls the next, and the next pushes or pulls the next, and so on, until every intervening air particle is set into vibration. It is a mechanical propagation, as much (though not exactly in the same way) as if I took hold of a long stick, and pulled or pushed it against a person who had hold of the other end. Every particle of air between the speaker and the listener partakes of the same motion, and every person between the two hears the same sound. But with the telephone it is altogether different. By that I am seeking, not to propagate the sound vibrations between here and the next town, from my vocal organs to the ear of the person to whom I am speaking, in that way. It is done in such a way that the persons between us will hear nothing. There will be no agitation of the air between us, due to my voice. I am to produce a fresh and a new vibration at that point, which shall affect his ear, and which does not reach him by mechanically starting here and passing through the intervening mass of air. There is no mechanical motion between him and me. What I am to do is to have a contrivance at the distant station which shall there create fresh vibrations, which do not exist in the interval between us. The vibrations which I am to create there are not merely some vibrations, nor even those which will excite the sensation of sound of a proper pitch, nor those which would excite the sensation of sound with the proper loudness, but they must be of the right *character* of vibration in order to excite in him the sensation of the right *quality* of sound; and then he will understand. The problem which I have to perform, therefore, is to find a contrivance which will produce this effect. The way in which it is done is by vibrating a diaphragm at the receiving station; and the mechanical problem is to take that diaphragm at the distant station, and by some kind of contrivance lay hold of it, so that I can shake it at my will; not merely shake it, but shake it as I want to shake it. When I want a listener to hear the word "yes," I want to shake it in such a way as to produce the vibratory motions which belong to that word "yes"; and when I want him to hear "no," I want to be able to shake it in a different way, so as to correspond with the word "no." That is the problem. How are we to do it?

Before I pass from that, let me explain one phrase which is commonly used in this patent and in this argument. You will find when you come to the patent, and you will also find in the depositions on both sides, the phrase "*form* of vibration" frequently used. You sometimes, naturally, but still incorrectly hear the phrase "*form* of sound waves." When a painter says that he is going to paint the waves of the sea, and represent their form, we know what he means. When a physicist speaks of the "form" of sound waves, he does not mean what the painter does, or anything like it; he does not mean form which can be represented by a photograph, so to speak, of a visible thing (although there is a certain connection between the two, because one cause leads to both), but he means to express the result of a particular geometrical idea which, when I explain it to you, you will see is signified to the physicist by the term "form." Suppose, for example, that I have an air particle vibrating to and fro between the speaker and the listener, and can attach to that air particle, in some way, a pencil which will vibrate with it. When I speak one word, it vibrates in one way, in one manner and fashion; when I speak another word, it will vibrate in another manner and fashion. Now, suppose while it is vibrating, I put this paper under it and draw it along at right angles to the vibrating path. If it is vibrating in one way, it will make a wavy line on the paper. If vibrating a little differently, the wavy line will be a little different. Each particular motion, each peculiar vibration, and every variation of its motion in performing that vibration, produces a different line. Now, a person with an instructed mind, looking at that paper and observing the form of the curve which the vibrating particle of air drew when the word "yes" was pronounced, will observe that the *form* of the curve is different from that which the particle of air, with the pencil attached to it, drew when you pronounced the word "no." Therefore, I may properly and conveniently speak of the "*form*" of the vibration of the air particle, meaning thereby the form of the curve which it would draw if I fastened a pencil to it and drew the paper along under it. That is what we mean by the phrase "*form* of vibration." It has nothing to do with the contour of an actual wave. It simply comes from this convenient, graphic, geometrical way of representing the fashion in which that air particle waggles to and fro, now in one way and now another, and as it waggles in each different way it makes a different curve. I have here a little contrivance which I have used once before which shows that curve. Suppose the air particle be represented by this pencil moving to and fro in this slot; now I slide the paper along at right angles to the motion of the pencil, and the vibrating movement of the pencil makes a curved line. Each difference in vibration produces a difference in the line.

Suppose, now, that from a distance I want to produce that form of vibration. Suppose that piece of red wood in the slot be the air particle. I can pull it one way by a string, and the spring attached pulls it back; I can make it vibrate just as I may desire in that way. And if I have a little pencil there, fastened to that bit of red wood when it is vibrating, the pencil will mark on the paper the *form* of the vibration, — the paper being drawn steadily along during the vibration; in that way we shall have drawn on the paper a line at each vibration. If I can control the pencil *at every instant*, I shall control the way it vibrates. If at every instant I control the length of this string between the edge of the frame and the pencil, I shall control the successive positions and the whole movement of the pencil. Suppose I want to do that with my eyes shut; if I can train my hand sufficiently, the difference of force which I apply to the string from instant to instant will determine the way the particle vibrates. If I simply jerk it, the spring will pull it back and it will vibrate, but it will not vibrate the way I want it to. If I want it to be obedient to my will, I must keep hold of that string all the time, and by varying the force applied to that from instant to instant, I can control the way in which the particle vibrates. You can see very readily again, if you look at it on this paper, that the force applied to that string from instant to instant determines how the particle is to vibrate. That is the way in which the telephone is made to talk.

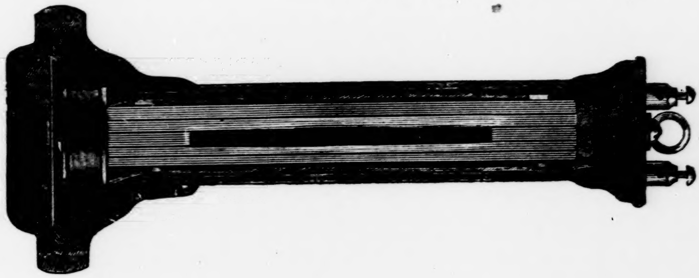
I have here a contrivance which is the gist of the speaking telephone. It is a part of the well-known commercial magneto instrument. It consists of a steel magnet, the end being prolonged into a little core, around which is wound a coil of fine copper wire insulated. That is quite a powerful permanent magnet, as your Honor will find. With that contrivance, if I place a piece of iron very close to the end of the magnet, where the coil is, and then pull it away quickly, I shall excite in the wire which forms the coil an electrical tendency to flow in one direction. If I bring the ends of that coil around and connect them, so that there is a path which the electricity can flow through, then there will be a current in that direction. That is, as I suppose your Honor already knows, the principle of what is generally known as the Dynamo machine. If I move this armature or piece of metal up to the core of the magnet, I shall also excite in the electricity a tendency to flow. If I move the piece of metal up to it, the tendency of the current, generated by the expenditure of the force of my fingers, is to flow in one direction. If I move the piece of metal away, the tendency is to flow in another direction. Now, it is not the *position* of the armature which makes the current. There is no more current when the armature is close to the magnet than there is when it is in the next room. It is the *motion* of the armature which makes the current. In other words, it is the expenditure of the force of my fingers which generates or is the cause of the electrical disturbance and flow. And, inasmuch as it is not the *position* of the armature but only the *motion* which generates the current, it necessarily follows that as long as you move this piece of metal within the magnetic reach, the current is flowing in that coil and the connected circuit. When I stop moving it, no matter where I stop, the current stops too.

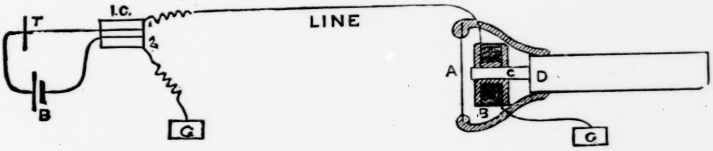
That is not all. That current, in its flow, is due to the motion of the armature. If I move the armature gently, the current is gentle; if I move it violently, the current becomes violent. Your Honor sees very well, therefore, that the currents which are produced in this contrivance have to correspond to the motion of this piece. So long as this moves, the current flows; if this moves violently, the current flows violently; if it moves gently, the current flows gently. You can therefore fairly say that all the currents represent, or are copies of, the motion of this. If now, instead of moving this by my finger, I use as armature a thin disk of sheet iron and speak to it, the vibrations produced in the air by my voice move that thin disk just as they would move the drum of the listener's ear and in quite the same way. This thin, elastic material can and will move in the same way if supported properly at the edges. Suppose now, that instead of using this thing which I hold in my hand and wave in front of the magnet, I place here this thin diaphragm, supporting its edges on a frame in front, and speak to it. Then it will move, and every motion of this disk which constitutes the armature (so prompt and so accurate is the performance of the apparatus), every motion of it to and fro, as it vibrates, generates a current in these coils which will correspond to the motion just as it did when I moved the heavy armature with my hand. The motions of the electricity in the coil, or, so to speak, the currents of electricity, will correspond to and will be the copies of the vibratory motions of this plate.

One more thing: if I speak to that, the motions of this plate are copies of the vibrations of the air particle. My voice moves one particle, and that moves the next one, and that moves the next one, and thus the same motion is communicated through them to the disk; it not merely makes it vibrate, but makes it vibrate in the same way, manner, and fashion, causing this to perform the same *form* of vibration. What is the consequence? Why, that the currents which the motion of this produces in obedience to itself, in this coil, are themselves the copies of the motions of that armature disk, which are the copies of the motion of that air particle; so that the currents may very properly be said to be copies of the very motions of the air particle agitated by my voice. If the agitation of the air particle is at any instant violent, the current becomes more violent; if the agitation of the air particle is less violent, the current at once weakens. Now it is true, not merely when I move the particles of air, not merely when I move the armature to and fro, that the currents arise, but if, while moving the armature from one extreme of its vibratory path to the other, I move it fast during the first part of the path, then the current at that instant is strong, and if I move it slow during the next portion of the same movement, the current is weak. Let it return part way on its path, and the current returns on its path. The changes of current, therefore, are copies of the motions of the armature, not merely in respect to the time during which the total motion takes place, not merely in respect to the mean violence of the movement of the armature during its total motion, but in respect to every change which can take place in the motion of the armatures while the motion from one extreme to the other is being performed. The currents, therefore, will not correspond merely in number to the vibrations of the armature (and the air particles which move it), but they still correspond in their *character* to what I have described as the *form* of the vibration which the armature and its actuating air particle perform.

Now, it is common enough to represent a varying current in the same way by a curve. Your Honor sees the Signal Service once a week represent the height of the barometer from day to day by a curve. In brokers' offices, the varying prices of cotton and of gold and stocks are represented by curves in the same way. So, in the same way, we can represent a variation of a current by a curve. There is no trouble in drawing a curve which shall represent now a strong current and now a weak one. As the current increases, the curve goes up; as the current falls down, the curve falls down. Now those changes in current correspond to the vibratory motion of the air particle moved by my voice, or, looking to the curve which represents the changes of current strength, we perceive that the curve which represents these current variations will be similar to the curve which represents the changing vibrations of the air particle. If the air particle moves in a particular fashion from one end to another, then the current will vary in that particular fashion, during the same time. If the air particle changes its manner of moving, and moves in a different fashion from one end to the other, then the current will vary in a different fashion. I shall then have currents which, in their changes, will be copies of the vibrations of the air, and may be correctly expressed in the manner I have stated, that is, represented by curves of similar forms. I might say that the electrical changes are all of the same *form* as the air vibrations which cause them.

What shall we do with those electrical changes or varying electrical currents when we have got them? At the distant station we will provide another apparatus of this kind. It is the same thing which I have already shown in illustration, except that now it is put in a case, and the diaphragm is mounted so as to be supported by its edges in front of the electro magnet. For convenience of illustration, I will add another figure in which T, I C and B represent a transmitter different from what I have described, and the other figure at the right represents the operative parts of a magneto telephone stripped of most of the case. A is the diaphragm, C the core, D the large permanent magnet, B the coil. Suppose now that diaphragm A to have a perfectly flat surface. I put it on the frame, and there is a pull now on it by the force of that magnet C. This pull holds it, bends it a little in the middle, and the diaphragm is no longer flat. The elasticity of the diaphragm prevents its being pulled in very far. Its position at any instant is determined by the relative strength of the two forces, the pull of the magnet in one direction tending to bend it, and the elasticity of the diaphragm tending to keep it flat. If the magnet pulls it harder, it will bend in further. If I increase the strength of that magnet in any way, it will pull it in further. If I diminish the strength of that magnet,





the elasticity of the diaphragm will act, and it will go back. Now just as in the apparatus with the string and spring which I showed before, by varying the strength of the pull (produced in that apparatus by my hand, and in this by the magnet), when we vary the strength of pull on the centre of this diaphragm, we pull it in or let it go back; if we increase the strength of the pull, it will pull it in; if we diminish the pull, the diaphragm will go out. By varying the strength of the pull which that magnet exerts on the centre of the diaphragm, I can move the latter and vibrate it, and not only vibrate it somewhat, or to some extent, but if I can control absolutely the pull which that magnet exercises upon the middle of this diaphragm, I shall control the way in which that vibrates just as I do in this string apparatus. If, therefore, I can *at every instant* control the strength of that magnet, or vary it according to my will, I can control the manner in which the disk vibrates, not merely as to the number of times it shall vibrate per minute, but I can control *the way in which it moves* while moving in a definite period of time, or in any period of time, from its extreme position in one direction to its extreme position in the other. How shall we do that?

If through the coils B of this electro-magnet of this receiving instrument, I pass a current of electricity in a certain direction, I shall increase the magnetism of the magnetic core C, and make it a stronger magnet. If I pass a current in the other direction, I shall partially neutralize the magnetism of this core, and it will become weaker. But that is not all. If I pass a strong current, I shall strongly increase it (or decrease it); a weak current will be less felt. I can control the magnetism of that core by passing a current through its coil. I can make the variations of magnetism in this core correspond to the current variations, because they obey and are in consonance with the variations in strength of the current passing through that. If I can control, absolutely and at every instant, the variations of the current passing through this coil, I can control, absolutely and at every instant, the variations of the strength of the magnet inside the coil, and therefore the force with which it pulls at the centre of that diaphragm. How may I do that? Let me take the currents which I have already generated by speaking to the other instrument at the other end of the line. Those are true electrical currents, capable of making a magnet, or, if already magnetic, of increasing or partially neutralizing its force. Now, if those currents, which in themselves are copies of those vibratory motions of the air particles which exist when I pronounce the word "yes," that is, vary in strength in accordance with those vibratory motions, are passed through this coil, then they will vary the strength of that magnet, just in accordance with the condition of the current. If these currents are, in the sense that I have stated, copies, in their increase and diminution of strength, of the vibratory motions of the air particles, they, in turn, in passing through the coil, will cause in the core C magnetic variations which are copies of themselves, varying the pull on the centre of that diaphragm in accordance with that varying magnetic strength. Then I shall arrive at this result: the pull on the centre of the diaphragm being the consequence of the magnetic variations, and a copy of them, and those magnetic variations being the consequence of, and therefore a copy of the electrical variations of the current which passes through this coil of the receiver, and they in turn, being copies of, because they are the consequence of those produced at the other end by the voice, I shall get on this diaphragm D a varying pull, which, not only in the period of its recurrence (so many times a second), but in every other particular, will be a copy of the vibrations of the air particle at the transmitting station.

Now, I have a contrivance in and by which every vibration of the air particle itself at the transmitting station will produce a corresponding change in the pull on the diaphragm of the receiver. All that I have to do then is to speak to this transmitter, and its diaphragm, being actuated by the voice, or rather by the mechanical action of the vibrating air performing a vibration which is that of the word spoken, produces electrical changes or undulations which are the same in *form*, and are true copies of the vibratory movements which exist at the transmitting end and which we want to produce at the receiving end to there act on the listener's ear; these electrical changes will in turn, by means of this contrivance, produce the same vibrations in the apparatus at the listener's station. You will observe that the essential thing is that the thing which links together the diathe elasticity of the diaphragm will act, and it will go back. Now just as in the apparatus with the string and spring which I showed before, by varying the strength of the pull (produced in that apparatus by my hand, and in this by the magnet), when we vary the strength of pull on the centre of this diaphragm, we pull it in or let it go back; if we increase the strength of the pull, it will pull it in; if we diminish the pull, the diaphragm will go out. By varying the strength of the pull which that magnet exerts on the centre of the diaphragm, I can move the latter and vibrate it, and not only vibrate it somewhat, or to some extent, but if I can control absolutely the pull which that magnet exercises upon the middle of this diaphragm, I shall control the way in which that vibrates just as I do in this string apparatus. If, therefore, I can *at every instant* control the strength of that magnet, or vary it according to my will, I can control the manner in which the disk vibrates, not merely as to the number of times it shall vibrate per minute, but I can control *the way in which it moves* while moving in a definite period of time, or in any period of time, from its extreme position in one direction to its extreme position in the other. How shall we do that?

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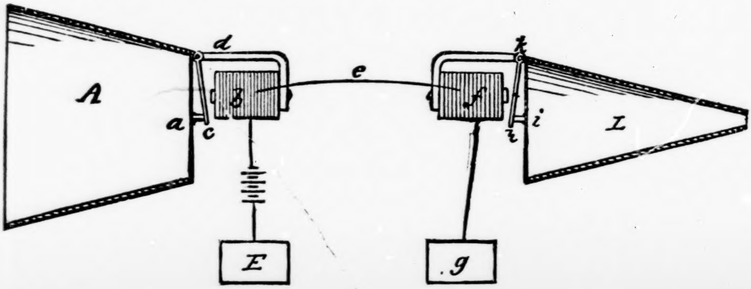
> "The armature *c*, Fig. 7, is fastened loosely by one extremity to the uncovered leg *d*, of the electro-magnet *b*, and its other extremity is attached to the centre of a stretched membrane *a*."

In that contrivance, instead of a plate of iron, Mr. Bell used a piece of bladder, or of membrane, or of parchment, stretched. As a membrane will not act upon a magnet, we must have a piece of magnetic metal, such as iron, fastened to it in some form, and have that piece of iron hung so that it will vibrate, and have the centre of the membrane fastened to that; and then the bladder and the attached iron are the equivalent of the disk of iron alone, which I have been using in my illustration.

> "The armature *c*, Fig. 7, is fastened loosely by one extremity to the uncovered leg *d* of the electro-magnet *b*, and its other extremity is attached to the centre of a stretched membrane *a*."

The Court. Which is the armature *c*?



Mr. Storrow. The armature *c* is this little piece of metal which comes down in a slanting direction in Fig. 7, at the bottom of the second page of the drawing. Across the end of that cone A, there is fastened a membrane. Then, hinged up at *d*, is a little piece of slanting metal *c*. That is the armature. That is hinged as you see it represented there, by one extremity to the leg *d*, and the other end is fastened to the centre of the stretched membrane.

> "A cone A, is used to converge sound vibrations upon the membrane. When a sound is uttered in the cone, the membrane *a* is set in vibration, the armature *c* is forced to partake of the motion, and thus electrical undulations are created upon the circuit E *b e f g*."
>
> "These undulations are *similar in form* to the air vibrations caused by the sound. That is, they are represented graphically by similar curves. The undulatory current, passing through the electro-magnet *f*, influences its armature *h*, to copy the motion of the armature *c*. A similar sound to that uttered into A is then heard to proceed from L."

The specification of the patent does not go through the long explanations which I have made, for those are matters which are familiar to everybody to whom this specification is addressed.

What then takes place is, that when the sound is uttered in the transmitter, the membrane is set in vibration, and the attached armature partakes of the same motion. This creates electrical changes. Those electrical undulations are "*similar in form*" to the vibratory motions which cause or constitute that sound. This undulatory current goes to the receiver. It influences its magnet to do what I have described and shown in this apparatus. The consequence is that "a similar sound to that uttered" into the instrument at the one station "is heard to proceed from" the receiving instrument at the other station.

That is the description of the speaking telephone, as given in the patent. Claim 5 based upon that description is: —

> "The method of, and apparatus for transmitting vocal or other sounds telegraphically, as herein described, by causing electrical undulations, *similar in form* to the vibrations of the air accompanying the said vocal or other sounds, substantially as set forth."

This is a claim which is a model, for this reason: In the first place, its avowed purpose is the transmission of vocal sounds. That, so far as public knowledge was concerned, was absolutely novel in the world. I am not now speaking of what the defendants may have proved to have been done by their man, but, so far as public knowledge went, it was an absolute novelty. Again, the way in which it is proposed to do it is by causing electrical undulations similar in form to air vibrations. When you have done that, you have attained the result of producing the vibrations by which speech is transmitted, and so far as I know the only way in which it can be done. If you have not done that, you have not transmitted speech. This claim, therefore, describes and puts its finger upon a result which is novel. That novel result is obtained by practising that mode of operation and not otherwise, and that mode of operation is novel. More than that, it is a claim for a method and for an apparatus. Whoever transmits speech by the method there pointed out, creating and utilizing electrical undulations similar in form to sound waves, infringes and copies that method. Whoever makes an apparatus (no matter what subordinate changes there may be), the main feature of which is that its mode of operation consists in the creation and utilization of that particular kind of electrical undulation, which is similar in form to sound waves, copies that apparatus. These are things that I have not got to discuss. In the first place, they are not seriously in controversy here. Both parties agree, I think, as to the scope of the patent which the first inventor of a telephone should have. The question between us is as to who is the first inventor.

Moreover, this patent has been elaborately construed at least three times, once by the Commissioner of Patents in a contested case, once by Judge Lowell in Spencer's case, and once by Judge Lowell and Mr. Justice Gray in Dolbear's case. In the latter case, the question turned on the construction of the patent, on the meaning of the patent, whether it was a broad patent, covering whoever transmitted speech by causing electrical undulations similar in form to sound waves, irrespective of the details of his mechanism. The mechanism in Dolbear's case differed more from the specific description in the patent than has ever been devised by anybody else; and yet the essential thing, the thing which made it talk, was the action of the voice at one end, creating electrical undulations, changes and disturbances similar in form to sound waves, and the contrivance at the other end which utilized those undulations to produce the vibrations which agitated the speaker's ear. See all these in brief, pp. 33, 69.

Judge Gray held in Dolbear's case (15 Fed. Rep. 448), that the patent covered, and rightfully covered, that kind of contrivance. He said (p. 451) : —

> After showing how two or more telegraphic signals or messages may be sent simultaneously over the same circuit without interfering with one another, he adds : " I desire here to remark that there are many other uses to which these instruments may be put, such as the simultaneous transmission of musical notes, differing in loudness as well as in pitch, and the telegraphic transmission of noises or sounds of any kind.
>
> " When the armature *c*, Fig. 5, is set in vibration, the armature *h* responds not only in pitch but in loudness. Thus, when *c* vibrates with little amplitude, a very soft musical note proceeds from *h* ; and when *c* vibrates forcibly, the amplitude of the vibration of *h* is considerably increased, and the resulting sound becomes louder."
>
> He proceeds to say : " One of the ways in which the armature *c*, Fig. 5, may be set in vibration has been stated above to be by wind. Another mode is shown in Fig. 7, whereby motion can be imparted to the armature by the human voice or by means of a musical instrument.
>
> " The armature *c*, Fig. 7, is fastened loosely by one extremity to the uncovered leg *d* of the electro-magnet *b*, and its other extremity is attached to the centre of a stretched membrane *a*. A cone, A, is used to converge sound-vibrations upon the membrane. When a sound is uttered in the cone, the membrane *a* is set in vibration, the armature *c* is forced to partake of the motion ; and thus electrical undulations are created upon the circuit E *b e f g*. These undulations are similar in form to the air-vibrations caused by the sound, that is, they are represented graphically by similar curves. The undulatory current passing through the electro-magnet *f* influences its armature *h* to copy the motion of the armature *c*. A similar sound to that uttered into A is then heard to proceed from L."
>
> The reference to Fig. 7 will be better understood by repeating, slightly amplified, Judge Lowell's explanation in *Spencer's case*. A cone of pasteboard or other suitable material, A, has a membrane *a*, stretched over its smaller end ; at a little distance is the armature *c*, consisting of a piece of iron magnetized by the coil of the electro-magnet *b*, through which is passing a current of electricity. When sounds are made at the mouth of the cone A, the membrane *a* vibrates like the drum of a human ear ; and the armature *c*, which is

directly in front of the magnet *b*, vibrates with this membrane, and its movements cause pulsations of electricity like those of the air which excited the membrane to pass over the wire *e*, which stretches to another similar magnet *f*, and cone L, with its membrane, and its armature *h*. The second armature and membrane take up the vibrations and make them audible by repeating them into the second cone L, which translates them into vibrations of the air. In practice, a metallic diaphragm or disk is often substituted for each membrane.

The inventor adds this explanation: "In this specification the three words 'oscillation,' 'vibration' and 'undulation' are used synonymously, and in contradistinction to the terms 'intermittent' and 'pulsatory.' By the term 'body capable of inductive action,' I mean a body which, when in motion, produces dynamical electricity. I include in the category of bodies capable of inductive action brass, copper and other metals as well as iron and steel."

His fifth and final claim is of "the method of and apparatus for transmitting vocal or other sounds telegraphically, as herein described, by causing electrical undulations, similar in form to the vibrations of the air accompanying the said vocal or other sounds, substantially as set forth."

In this claim, as throughout the specification, the word "method" is evidently used, not as synonymous with "mode" or "apparatus," but as equivalent to "process"; just as it was used by Chief Justice Taney, delivering the judgment of the majority of the Court, in *Morse* v. *O'Reilly*, 15 How. 62, 117, as well as by Mr. Justice Grier (who dissented in *Morse* v. *O'Reilly*) in delivering the unanimous judgment in *Corning* v. *Burden*, 15 How. 252-267. And the invention claimed is not merely the apparatus described, but also the general process or method, by which the wind, or a musical instrument, or the human voice, produces in a current of electricity a succession of electrical disturbances, not sudden and intermittent or pulsatory, but gradual, oscillatory, vibratory or undulatory, so as to give out at the farther end of the conducting wire sounds exactly corresponding in loudness, in pitch and in tone, character or quality, to the sounds committed to it at the nearer end.

The opinion in *Spencer's case* clearly points out that "Bell discovered a new art — that of transmitting speech by electricity — and has a right to hold the broadest claim for it which can be permitted in any case," and "the invention is nothing less than the transfer to a wire of electrical vibrations like those which a sound has produced in the air"; and that his patent, while not covering the abstract principle, without regard to means, of transmitting speech by electricity, yet is not limited to a particular form of apparatus, but includes the process or method (using the two words as equivalent), the essential elements of which are "the production of what the patent calls undulatory vibrations of electricity to correspond with those of the air, and transmitting them to a receiving instrument capable of echoing them."

The evidence in this case clearly shows that Bell discovered that articulate sounds could be transmitted by undulatory vibrations of electricity, and invented the art or process of transmitting such sounds by means of such vibrations. If that art or process is (as the witnesses called by the defendants say it is) the only way by which speech can be transmitted by electricity, that fact does not lessen the merit of his invention, or the protection which the law will give to it.

The mode or apparatus by which Bell effects his purpose is, by using an electro-magnet in the transmitter, and another electro-magnet in the receiver. But the essence of his invention consists not merely in the form of apparatus which he uses, but in the general process or method of which that apparatus is the embodiment.

Here is a model which conforms substantially to the drawing.

There is a little difference between the instrument which I showed to your Honor, and this model. In fact there are several differences. I showed the modern commercial telephone, which is a better instrument than any shown in the first patent. This is the improved instrument described and claimed in the second patent somewhat more improved in form. The improvements contained in it do not change the character or mode of operation; they make it do the same thing better. For example, in the original there is no permanent magnet. Here in this there is a permanent steel magnet. Let me say right here, that it is essential to the operation of this apparatus that there should be a magnet in it. You may have an armature which is magnetic, or you may have a core which is magnetic; but you must have the one or the other magnetic. Now you can make that piece of metal magnetic in two ways. You can take a soft iron core, which is neutral and has no magnetism, and put the coil around it in the circuit of a battery, which will produce a continuous flow of electricity; and that will magnetize it with this flow which the battery gives. But with a *constant* flow alone, no matter what its strength may be, you will not succeed in making a telephone talk. The *changes* in the current which produce changes in the magnetism of the receiver is what makes the telephone, and the action of the voice produces those changes in current. The introduction of a battery in the circuit enables us to dispense with the heavy steel magnet. I should rather say that the introduction of this heavy steel magnet enables us to dispense with the cost, annoyance and trouble of a battery. They have the same function, which is to give us a magnetic core. Now, the fact is that this little core is not a magnet itself, it is a piece of soft iron simply. It is therefore essential that it should be magnetized by some means. I can magnetize it by inserting a battery in that circuit so as to send a constant current through the coils around the core, which will make it magnetic, or I can do it by attaching to it a large and powerful magnet, the magnetism of which, flowing into the empty soft iron so to speak, makes it for the time being magnetic. If I take the soft iron core away, it will be no longer magnetic. It derives its magnetism by "induction," to use a convenient phrase. The magnetism of this large mass of steel, permanently magnetized to a high degree, flows into the core so to speak, and makes it magnetic for the time being. That is what the battery shown in Fig. 7 is for, to make this core magnetic. The first patent employed a battery to magnetize the core, and the second employed a permanent magnet for the same purpose.

Judge Gray's opinion gives a lawyer's statement of the patent. An excellent succinct scientific statement of it is given by Prof. Cross (complts, ii, 1707, ans. 3, quoted in brief, p. 62).

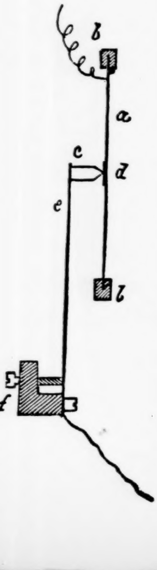
There is another form of contrivance by which the voice can produce these same electrical changes. The gist of this operation by which we transmit speech consists in the production of electrical changes which are *similar in form* to the air vibrations. If, instead of the transmitter which I have described, I can make a change in that instrument which will produce this same kind of variation in the current,—that is, variations which correspond to the vibrations of the air particle,—I shall not change the nature of the operation, or of the machine as a whole, or the method by which I transmit speech. I may make a contrivance which will be more efficient than that one, which shall do its work better, which shall be stronger or cheaper, or I may make a contrivance which will not do it so well. The contrivance which is commonly used commercially, because it is stronger in its effects, is a contrivance known as the microphone.

If I have a wire, through which a current of electricity is flowing, the electricity, to use the ordinary forms of speech, flows from one particle of that wire to the next, and so on through the wire. If I cut that wire into two parts, and separate them a foot, then the current does not pass, because there is no way for it to get from one to the other. If, now, I bring the two ends of the wire together again, the current will flow from this end of this wire of iron or copper, to the end of the other in contact with it; but it will not flow so well, because the union of particles is not so intimate when I simply place the ends of the wire together as it was in the uncut wire. But if I place them together so that they touch, the current flows. If I press them together harder, then the union of the particles will be more intimate, and the condition of things more closely approximate to that of the uncut wire, and the current will flow more easily. If I relax the pressure, it will not flow so easily. It is a law of electricity that the strength of the current, flowing in a circuit, depends upon two things: one is the electric force or energy which is poured into that circuit by the battery, or other source of power; and the other is the electrical resistance which it has got to overcome. For example, when you are using a garden hose, if you drive your force pump harder, you will get a stronger stream. If, without changing the pump, you tread on the hose, and are heavy enough, you will partly shut down the stream. It is the same way with electricity. If you can turn the throttle valve, if you can increase the resistance, you will diminish the current. This contrivance, therefore (cutting the wire, and then placing the two ends together), enables me to vary the current or the strength of the current supplied by the battery, without changing the battery. If I press the two ends together, there is less electrical resistance to overcome, and the current passes more freely. If I relax the pressure, although some current still passes, I may dwindle it down so that it becomes extremely feeble. Therefore, if I can make a contrivance of that kind, by means of which I can vary the pressure in *accordance with the vibrations of the sound waves*, I shall have a contrivance by means of which I can vary the current correspondingly.

In this apparatus which I have already described, wherein an armature is vibrated in front of an electro-magnet, the resistance of the circuit, the electrical resistance which the wire and apparatus offer to the flow of electricity, remains the same; but as I vibrate the armature more or less violently, I exert more or less electrical energy in the circuit. I put more power to my pump, and in that way vary the current, although my hose and pipes remain the same. If, on the other hand, I use a constant battery which does not change its force, and put, so to speak, a throttle valve in the path of the current, or some contrivance which interposes more or less resistance, I can equally well vary the strength of the current. This does not vary it merely at the point of contact, or at the point where I apply the throttle valve, but if I vary it in any one part of the circuit, I vary it equally all through the circuit. It so happens that the law is a simple one; that the strength of the current is according to the electrical energy at work in the circuit at the instant, divided by the resistance which it has to overcome.

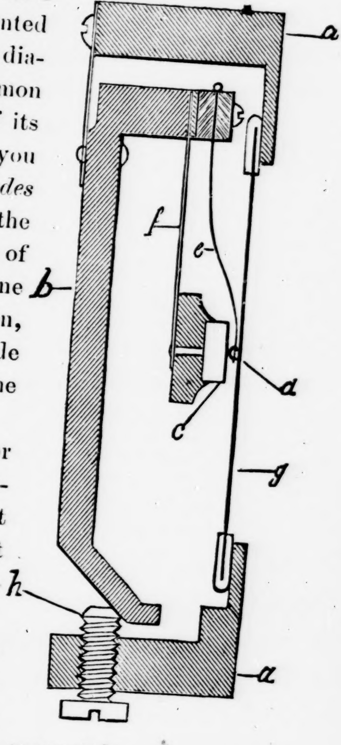
$$\text{Strength of current} = \frac{\text{electro-motive force}}{\text{resistance of the circuit,}} \text{ or } s = \frac{e}{r}.$$

If I double the resistance, I halve the current. If I halve the energy at work, I equally halve the current. I can therefore by a contrivance of this sort, if I can make it work practically, vary the current as I please. This is done by means of a contrivance which is of this type: here is one wire *e c* which is connected with one pole of the battery. The other pole of the battery is connected with this diaphragm *a d* which is held by its edges in the frame *b b*. If I place the end of the first wire *c* a quarter of an inch from the diaphragm, nothing happens, for the current cannot pass. If there is distance enough between to keep the current from passing, they might as well be in different countries. But if I bring them together as shown in the figure and touch them so that the current passes, then it will pass with a certain strength. The battery being the same all t time, the strength will depend upon the resistance . the point of contact of the end of the wire and th central part of the diaphragm. If I press it harder, there will be more current; if I press it less hard, there will be less current. Now, if I place them in contact and vibrate the diaphragm *d* by the voice, it will first move a little towards my wire end *c* and



push against it, and then will move back a little and press less hard against it. If I can regulate or arrange the contrivance so that the pushing and the pulling motions can be brought within such limits as never to make the disk and the wire-end part contact so as to interrupt the current, I shall have changes of pressure at the point of contact, and thus shall vary the current by the motions of the diaphragm and in accordance with them.

It has been found possible, but not altogether easy, to construct an apparatus of which that should be the type, — the current passing from the diaphragm or from something connected with it, to an electrode kept constantly in contact, but the one pushing or pressing upon the other more or less, according to the vibration of the diaphragm. In the cut which is one I happen to possess, the piece *c* is mounted on a spring *e* which presses towards the diaphragm. That apparatus, in its common form, is called a microphone. One of its various improvements is that while you may make the contact pieces, or *electrodes* as they are called, of many materials, the best material, or the best arrangement of materials found is to make either one or both of them of hard gas carbon, a substance which is deposited inside of gas retorts and is very hard and fine grained.



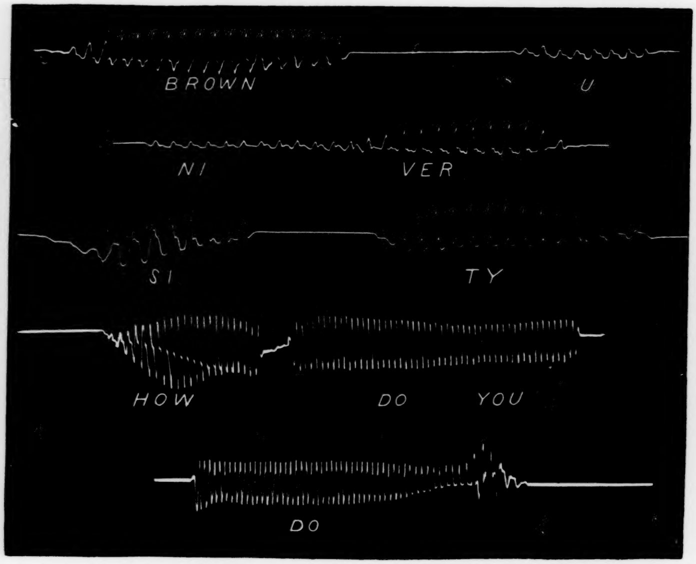
It is found that this possesses superior advantages, and will wear better than anything else that has been used. It is not the only thing that can be used, but it offers marked advantages, in many respects, over everything else.

The instrument I now show, the Blake transmitter, the one in commercial use, is an instrument of that kind. This cut shows the principal operating parts. The current from one pole of the battery is brought to *f* which is a spring, passes to the block *c* which is of hard carbon, — black in the instrument, — then to the little knob of platinum *d* about as big as a pinhead in contact with it, then through the delicate spring *e* to the distant station and back to the other pole of the battery. I omit reference to the induction coil, which has nothing to do with my present explanation. The carbon *c* and the knob *d* are not fastened together but merely held in gentle contact by the springs *f* and *e*, but the whole current has to pass through that contact. The knob *d* lies against the diaphragm *g*. If, now, by speaking into the mouthpiece against the diaphragm from the direction *g* (the mouthpiece being omitted in the cut), that diaphragm is made to vibrate, then on each particular vibration it is pushed back and pulled in again, — it is not a slow push such as I gave with my pencil, it is an extremely sharp. quick push, because it has to pass from one end of its motion to the other, as I am speaking now, in about the two-hundredth part of a second, — a quick, sharp push. Before this back electrode or anvil electrode *c*, as we call it, can get out of the way, the little knob on the diaphragm which presses against it gets squeezed in the process. If you hang up a sand bag, and strike it with your fist, there is a sensation of pressure on your fist, and that is just what takes place here. In the next movement, when the diaphragm comes back again towards *g*, that heavy weight will follow it by the force of the spring, but owing to the inertia due to the weight, it will not come quite so quick as the diaphragm. It takes a little time for it to follow, and while the diaphragm is moving away faster than the weight follows it up, the pressure is relaxed for a moment. Now, this instrument — and there are others, but this is the one in the ordinary use, known as the Blake transmitter — is so contrived that the pressure will be thus alternately increased and relaxed. The mechanical contrivances which accomplish this are the quick-moving diaphragm and the sluggish anvil electrode which carries the carbon. Its weight is what makes it sluggish. It weighs about seventy-five grains. If at any moment we have no contact, then we get into great trouble, for when there is no contact we lose all control of the current. All control ceases. When we get a flowing current we can control it and by it can control the receiver. What we have to do is to vary the current without interrupting it, and that apparatus is an apparatus which will do it.

If, in speaking, that vibration be stronger than the instrument is adapted for, or if you strike the box with the fist or with a pencil, the two electrodes *c d* jar apart, the circuit is broken, the current interrupted, and this makes a very disagreeable and rasping noise which is totally inarticulate in the receiver. In fact, I may mention one thing which may take place in the microphone. The speech which we hear at the receiving station is due to the vibration caused by the slight changes in the magnetic condition of the magnet of the receiver. In using that instrument I have a current flowing from the battery — a fairly powerful current, according to the size of the battery — all the time. An increase or diminution of pressure at the point of contact of the two electrodes makes a variation in this current, but a very small one. It varies it a little; even a little pressure varies the strength a little; but there is always contact sufficient to give a current. The variation is, perhaps, two or three per cent of the normal current. Now, if I suddenly stop that current by separating the electrodes, and then I bring them together again, see what I have done; instead of having a variation which will correspond to one fiftieth of the strength of the current, I have a variation which results from throwing on and off the whole battery; if the battery current be of the strength of one hundred, the speaking variations may be between ninety-nine and one hundred and one: but breaking the circuit makes a variation of one hundred to nothing, which is fifty times that large. The consequence of that is, that the magnetic change here in the receiver becomes very much greater, and I get a sound which is disagreeable and rasping to the ear, and very loud. The sound produced by the breaking of the circuit, in an ordinary instrument, can be heard several feet away. The sound produced by the ordinary variation of the current is so slight that you need to put your ear close to the instrument.

I have roughly described the electric transmission of speech; and yet, something more than description is needed to enable one to realize what it is. In their motions, these air particles do not, perhaps, traverse over the millionth of an inch. They occupy, with the ordinary voice of a man, only the two-hundredth of a second in going from one end to the other; with the voice of a woman perhaps half as long. They are minute and feeble almost beyond the power of expression, and yet I am going to rely on them to produce a sound at the distance of a mile, or of ten miles, or of a hundred miles away. I am to produce not only a sound, but to produce just the kind of sound that I want. Because if I do not do that, the mere noise will do no good. You must make the right kind of sound. Think for a moment what that problem is. I am going to make them not only produce a vibration, but I am going to do it so that when I speak one word in front of the transmitter, it will produce one form of vibration, and when I speak a different word it will behave differently. It must take note of the differences in vibrations between one word and another, and not only take note of them, but it must correctly repeat them. It must be actuated by those differences. Think what those differences are. In a journey which does not exceed the five-hundred-thousandth part of an inch in space or the two-hundredth part of a second in time, the differences between the way in which that air particle performs that minute journey in that minute period, under the influence of different words, must be such as to distinguish between every sound in such a way that the ear can readily distinguish one from the other. Think of what a myriad of sounds there are, and then try to imagine how minute must be the distinctions which separate the vibrations which are due to one word from those which are due to another, since such myriads of them can be packed within those minute limits of time and space. A speaking telephone has not only to take note of the existence of all those differences, but it has to earn its living by distinguishing between one and another; differences which, up to the time of the speaking telephone, men hardly more than speculated about the existence of, and barely had experimental proofs of the existence of, the speaking telephone has to make its living by. It takes almost the imagination of one used to dealing with infinitesimal and impossible quantities to realize the existence of differences so minute. One distinguished writer said of the telephone that it was an instrument that realized a mathematical conception. He said it well. The realities of the mathematician are what other men can only imagine; his imaginary quantities are what other men cannot imagine to be possible; it almost needs such an imagination to conceive of that which the telephone practically utilizes. You can almost apply to it the words of another mathematician, that it "harnesses a thought to the service of man." And yet so true is it to the laws of nature, that any schoolboy can make one *after he has been told how.*

Now I ask you to turn to complts, i, p. 31. You will find there a representation of some sound curves which were actually drawn by the voice of Prof. Pierce of Brown University. He arranged a diaphragm in such a way that he connected with it a little mirror; one edge of this mirror was fastened to a frame, and the other to the centre of the diaphragm. As the diaphragm vibrated the mirror also quivered in the same way. This mirror reflected a ray of light. He brought a ray of light into a dark room, and allowed a pencil of light to fall on the mirror and be reflected off to the other side of the dark room, so that you could see the spot of light on the wall. He thus in effect attached an amplifying lever about twelve feet in length to the diaphragm, — a beam of light, a lever without weight, without inertia, which would not bend or spring, which was perfectly true, and which amplified the motion. He moved a piece of photographic paper under that ray of light just as I did under my pencil, and as the spot of light vibrated on the moving sensitive paper, it left its mark; and this illustration in the record is a reduced copy of it. It was actually made by the voice, not speaking through a telephone, but by speaking directly against the diaphragm. He exerted his voice to the utmost, making it as loud as possible, and the motion thus obtained he amplified by the long lever which his beam of light gave him; and there you will see in the illustration, although not very accurately, yet you will see enough to give you an idea of the difference in the "form" of vibration which distinguishes "quality." If you compare the curves indicating the similar sounds, you will observe a certain similarity in the curves. Of course it is not accurate enough for anybody to read it, but it will give you an idea of what *form* of vibration means and is. It does not begin to be as accurate as the telephone. Those curves were, so to speak, actually drawn by the voice. A pencil was fastened indirectly to the air vibrations, and that pencil drew those curves.



The speaking telephone is to produce at a distance not merely an agitation of the air at the listener's ear, but just the right form of agitation; not merely the amplitude or loudness of the sound, nor the period or duration of the motion, the pitch of the sound, but just the right kind of sound. The Court will see that it will be difficult for a man to undertake to make an apparatus which will accomplish this peculiar, inconceivably delicate operation of producing the "form" of the vibration, unless he knew that that was just what he had got to do. You have got first to know what you have got to accomplish. It is not a thing which you can by chance stumble on in the dark; you do not evolve it by mixing up things in obscurity, and shaking them together. It is one of those inventions which is of a purely intellectual and scientific kind. Not that a man of mere intellect, or a merely scientific man, can do it; what we call invention is needed; but a man may go on working for a generation, no matter how high may be his intellectual or mechanical attainments, no matter how skilful he may be in making wood and iron move as he will, yet if he does not know what he has got to do to accomplish this thing, he will not do it. Before a man can devise a contrivance which will reproduce in the distance the *form* of vibration, even before he can set himself to work to devise such a contrivance, he must know what he is to set himself to work upon. Until a man knows that, until he knows what he has got to do, he will never find out to do it, — never find out the telephone. To use the words of a great master of acoustics, unless a man knows that, unless he knows what he is going to do, he will only spend his life in making ingenious contrivances to war against the laws of nature. He has got to know what is to be done. He has got to know not merely that he wants to get speech, but he has got to know what the diaphragm at the receiving station must do, how it must move before he can make a contrivance which will compel it to do it.

Alexander Graham Bell. To this task, Mr. Bell brought qualifications such as I think no man ever possessed before. It was not that he knew the scientific truths on which the telephone is based, better than other men. Not at all. It was that he had a kind of knowledge of them which other men did not have. He had been brought up from boyhood by his father, expecting to follow his father's profession, that of teacher of vocal physiology, — a profession involving a knowledge of how to produce and to perceive articulate sounds. His occupation for many years was teaching deaf-mutes to speak and to hear, so to speak, — teaching them mechanically to produce vibrations, the effect of which their ears could never notice; teaching them to recognize by sight these vibrations, or rather the motions of the organs which produce them, though their ears took no note of them; teaching them to produce mechanically, by placing the vocal organs in proper positions, the differences between one word and another. In that way, although perhaps scientifically he did not know more than others, he had got a kind of familiarity with this work, and a familiarity with these motions themselves, considered apart from audition, such as a workman gets with his tools. He made his living by them. They gave him his daily pleasure and his daily bread. He got that familiarity with them, and that reliance upon them, which led him, when he came to consider the subject of the transmission of speech, to do what mere learning would not have caused him to do, and which he could not have done without the training which his position had given him. He had very early thought of the possibility of thus communicating speech, but not as men may think of flying, or of other absurd things, as being a thing which cannot be done. His mind had been working in this direction. He saw within what limits the solution of the problem lay.

In the summer of 1874, he conceived the plan by which it might be done. He communicated that to his father, and his father made a note of it in his note book, not with sufficient fulness to show what the plan was, nor has his father any distinct recollection of it, but merely enough to know that the matter was spoken of. In the fall of 1874, under circumstances which it is not now necessary to spend time in repeating, he disclosed to Prof. Blake, of Boston, the distinguished aurist and professor at the Harvard Medical School, the method of transmitting speech, and a description of the apparatus by which he proposed to do it; and what he then disclosed to Dr. Blake was the method described in his patent, and the particular form of apparatus which is described in his patent, to wit, a stretched membrane with an armature fastened to the centre of it, vibrated by the voice, in front of an electro-magnet. He did not make the apparatus, but he described it to Dr. Blake, and Dr. Blake has testified to the particulars of the description. During that same winter he repeated the same description to Prof. Cross, Professor of Physics at the Massachusetts Institute of Technology; he has been a witness and has narrated what Mr. Bell said. But there was one difficulty which struck him as being in the way, as he then thought. He was to use these minute vibrations, or these differences between the vibrations, each of which was so minute as to almost defy detection; he was to use the differences between one and another to produce electrical currents, and not only to produce currents, but to produce such currents as would cause audible effects at distant stations.

Now, it was inconceivable (and the more a man knew about electricity and acoustics, the more he would believe it was impossible) that such feeble currents as these vibrations of the air would produce by means of such a contrivance, would be practically worth anything in the production of sound: they would doubtless be too feeble to be of any value. So he set himself to work to devise, not a different method, but an improvement, change or alteration in the apparatus which he had designed to accomplish that thing in accordance with that method. In the course of the year 1875 he had found out, in the course of experiments with other instruments, that currents generated by a slight vibratory motion of an armature in front of an electro-magnet had vastly more force than he supposed. They revealed to him that his proposed speaking telephone was not an impossibility. The moment when he made that experiment, or when the accident happened which revealed to him that fact in electricity and acoustics, he instantly, within the hour and before leaving the room, gave instructions to his assistant to make precisely the instrument which eight months before he had described to Dr. Blake.

The history of Mr. Bell's life is detailed in his deposition, but the substance of it is detailed in letters written at the time, and is not dependent upon anybody's memory. I will read an extract from one of them. He was employed in inventing the harmonic multiple telegraph, and had been for several years thus engaged. This is a contrivance which produces sounds of various pitch, and telegraphs by means of them; and the idea was to transmit simultaneously as many messages as he could simultaneously produce different notes at the end of a telegraph wire, and thus send six or eight or ten messages simultaneously over a single wire. That was before the quadruplex system came into use, and an instrument of that sort would have been of enormous value. It had nothing to do with a speaking telephone. The contrivance which he had made, up to a certain stage, had nothing to do with a speaking telephone, but it gave him some useful electrical knowledge. It taught him what to avoid rather than what to copy. The patent for the speaking telephone has two branches; and one of the sets of instruments, and one kind of operation ascribed to that set of instruments, was intended for the harmonic multiple telegraph. That is the instrument shown in Fig. 5. Another set of instruments is the one which I have referred your Honor to as the speaking telephone, to wit, Fig. 7.

In the early part of March, 1875, Mr. Bell was in Washington on business connected with his harmonic multiple telegraphic inventions, expecting at that time an interference with another and rival inventor in that same branch of telegraphy. At that time he went to see Prof. Henry, and told him of some experiments which he had made in the production of sound by electricity. Prof. Henry became interested, and asked him to repeat them. The story of that interview was told by Mr. Bell, in a letter to his father and mother, written a few weeks later; and I propose to read an extract from it to your Honor. You will find it on page 47 of our brief, and in complts, i, 126. It is dated March 18, 1875: —

> "We appointed noon next day for the experiment. I set the instrument working, and he sat at the table for a long time with the empty coil of wire against his ear, listening to the sound. I felt so much encouraged by his interest that I determined to ask his advice about the apparatus I have designed for the transmission of the human voice by telegraph. I explained the idea, and said, 'What would you advise me to do, publish it and let others work it out, or attempt to solve the problem myself?' He said he thought it was the germ of a great invention, and advised me to work at it myself, instead of publishing. I said that I recognized the fact that there were mechanical difficulties in the way that rendered the plan impracticable at the present time. I added that I felt that I had not the electrical knowledge necessary to overcome the difficulties. His laconic answer was, 'GET IT.'
>
> "I cannot tell you how much these two words have encouraged me. I live too much in an atmosphere of discouragement for scientific pursuits. Good . . . is unfortunately one of the *cui bono* people, and is too much in the habit of looking at the dark side of things. Such a chimerical idea as telegraphing *vocal sounds* would indeed, to *most minds*, seem scarcely feasible enough to spend time in working over. I believe, however, that it is feasible, and that I have got the cue to the solution of the problem."

Mr. Bell's history is stated in the letters contained in the brief, and in his deposition. In one sense it is not material to the case, though it might possibly become material in one view of the case to know whether his invention is to date from the filing of his application, or whether it is to date from some previous time. In considering that question, which I shall endeavor to consider by and by with the authorities, if I have time to spare, there is nothing now so important as to inquire whether, from the time he first had the conception (and he had already described the conception of his apparatus to two men perfectly competent to understand about it and to report about it,— Dr. Blake and Prof. Cross), he was fairly pursuing that plan, and endeavoring to reduce it to practice, or whether he had thrown it away as something not worth following. He went to Prof. Henry in February, 1875. He stated to him his troubles, his plan, his belief, his conception, and further stated that he felt the difficulty of *reducing it to practice* by reason of lack of knowledge; and he inquired of Prof. Henry what he should do, whether he should give it to the world as it was, in the confidence that better informed men would work it out, or work it out himself. Prof. Henry said to him, "Work it out yourself"; and he did do it. Now, when your Honor is called upon to consider whether in that matter Mr. Bell did wisely in pursuing the course that he did pursue, you will have to consider, first, the fact that it led to the speaking telephone within a year; and secondly, the fact that when the conception of the invention and the difficulties of the conception were disclosed to the man of this whole continent best qualified to judge what Mr. Bell should do, he said to him, "Do what you are doing. Go on in that way." And Mr. Bell went on in that way, and perfected the invention. He would be a bold man to-day who should say that the course of conduct which did, in fact, within a year, lead to a speaking telephone patent, and which at that time was approved by Prof. Henry as the proper, reasonable and just way, was so absurd and so unreasonable as to afford ground to think that this man meant to throw the invention away and think nothing more about it.

Follow down his letters, and you will see how, all the time, the speaking telephone filled his mind. He was working very hard on other things, supporting himself by teaching while he was working on some other electrical inventions, which he had begun long before, and in prosecuting which he had a partner, his engagement with whom required him to follow them out; but letter after letter showed how the speaking telephone filled his mind, not as a thing which men think of as they do of flying machines, or of perpetual motion, but as a thing that was feasible.

Mr. Edmunds. What was the instrument which he showed to Prof. Henry?

Mr. Storrow. What he actually had there and showed was a contrivance in which there was a current breaker at one end and a coil at the other, and which when pressed against the ear produced a musical note. I think it is described in the letters; at all events, it is described in the evidence; it had nothing to do with speech.

Now I come to the patent: Mr. Bell drew his specification in the fall of 1875. The filing of it was delayed by reason of the fact that he had arranged with a Canadian friend, who was going to England, to take out an English patent. Finally he became impatient and would wait no longer to hear from England, and filed his application Feb. 14, 1876, and the patent was issued March 7, 1876, No. 174,465. Then he came to the Centennial and exhibited his instrument there. When he got his patent, he went to work to improve the instrument, and did improve it, as we will show; and then he exhibited it at the Centennial. On the 25th of June, 1876, he transmitted speech at the Centennial with his instrument in the presence of the Board of Judges, two chief men of which were Prof. Henry and Sir William Thomson. After that exhibition, they took the instrument to the Judges' room, and continued to experiment therewith during the following week. They made reports, which appear in the record, in which they say, each of them, and Prof. Henry very strongly, that this contrivance of Mr. Bell's is the greatest marvel since the electric telegraph, and gives a most wonderful and surprising result. The reports are printed and the instruments described in complts, i, 232-239, complts, ii, 1685. Instantly all the newspapers took it up; it filled the world; it was announced all over Christendom. In a few weeks Mr. Bell became famous all over the world as the man who had invented that which the world had never known before; and so he went on. In the spring of 1877, he had got his instruments more and more improved. Appliances to go with them had been made. A business organization to put them into public use had been arranged. He went on, until now, as your Honor knows, the whole world is filled with them.

The advent of Drawbaugh. In the summer of 1880, there appeared in the newspapers this paragraph, from the *Cincinnati Commercial* of July 22, 1880 (complts, i, 13): —

"TELEPHONE COMBINATION.

Special to Cincinnati Commercial.

WASHINGTON, D. C., July 21.

"An application for a patent was filed to-day, that in consequence of its vastness of interest as well as wealth of prospect, renders it a subject of national interest. A company of leading business men has been formed that has bought up all the telephone patents antedating those now in use, and known as the Bell, Gray and Edison patents. The company is composed of leading business men from all parts of the country, Cincinnati being largely represented and interested. The cash capital of the company is $5,000,000, with headquarters in New York; and in about sixty days they will open up the telephone, which will certainly result in the driving out of all telephones in the market, save the ones they hold, or else the compelling the Gray, Bell and Edison lines to pay the new company a munificent royalty. It appears from the testimony now on file and in the possession of the new company, which is conclusive and exhaustive, that the inventor of the telephone is a poor mechanic, living near Harrisburg, Pa., named Daniel Drawbaugh. Owing to his poverty, he was unable to push his patent on the market. The new company have secured and are sole possessors of this invention, antedating those now in use. They are also owners of four patents for telephones issued to Mr. Klemm, of New York. A large number of capitalists were here to-day to see the filing of the application, and they assert, with a positiveness which is almost convincing, that it will not be long till they have entire charge of the telephones, not only in this country but in the world, and that they will be able to establish lines by which messages can be transmitted for almost a song.

"Mr. Lipman Levy, of the law firm of Moulton, Johnson & Levy, of Cincinnati, was here to-day in the interest of the Cincinnati parties, who, as already stated, are among the most prominent financial men of our city."

Of course we saw that. It was the first announcement, to the world at large at any rate, whatever may have been known in the vicinity of Drawbaugh's workshop, — it was the first announcement to the world at large that Drawbaugh claimed to be the inventor of the telephone. It came out over four years after Mr. Bell had become famous as the inventor. It came out when his instruments had been for more than three years in extensive public use in this country and abroad. We examined the matter. What was the story? It was, that a man living near Harrisburg, as it turned out the story was, had for ten or a dozen years in his possession instruments which he now said were speaking telephones; that fifty or a hundred people knew of them, but that not one of them had ever gone into use, and that they had never been brought to the Patent Office. It seemed to us at the first blush that the more men there were to prove that they knew of the existence of an instrument of which such things were alleged, and concerning which the facts were that it never went into use, and never went to the Patent Office, the more witnesses there were to prove that that thing was a failure, or that there was something about it which did not permit it to be used practically and usefully, and did not enable it or entitle it to be used as or called a speaking telephone. The more witnesses there were to such a story, the stronger the proof that no facts existed which could destroy a patent. We then brought this suit. The bill was filed Oct. 20, 1880. With it we filed a motion for a preliminary injunction, with affidavits and evidence in support of it, and the case came on to be heard in November, 1880, before Judge Blatchford. The defendants, in response to that motion, did not set up that Drawbaugh was the prior inventor. They had their pockets full of affidavits, they had lots of affidavits of these very persons whose depositions fill this record, but they did not set that up. They said nothing about it. Their answer to our motion for an injunction was, that they had not made any telephones, that they had not threatened to make any telephones, that they had not determined whether they would make any telephones, but that they were then waiting the opinion of counsel whether all these alleged inventions and pretensions of Drawbaugh's which they said they owned, were enough, or whether there was enough in that story to constitute a defence, and make it safe and prudent for them to make them (affidavit of Lewis Abraham). They had not yet reached that point. His Honor, Judge Blatchford, for obvious reasons granted an injunction, and that injunction has continued in force.

I now want to state the story of Drawbaugh, the story which the defendants set up as the history of his invention. The best way for me to do that, is to read one or two passages from their answer. That those may be the better understood, I ought to state that the bill itself was not simply a bill for infringement. It anticipated this defence. It was aimed directly at it. It alleged that the defendants, having determined to make telephones which they found were an infringement of our patents, having predetermined to do that, and hearing afterwards that Drawbaugh claimed to have made some early experiments, which experiments we alleged were incomplete, imperfect, unfruitful, and long ago abandoned, they bought him up for the purpose of setting him up as a prior inventor, and that neither he nor any of the defendants had done anything to advance the art of the transmission of speech; that the community had never acquired anything from them; that no instrument of Drawbaugh's had ever gone into use anywhere; that the instruments which the defendants had proposed to put into use were not his instruments, and were not copied from his in fact or in law; but that all instruments in use were instruments gotten up by independent inventors irrespective of Drawbaugh, and that the defendants hunted him up and brought him forward merely as a defence for an infringement already determined upon. It was in response to allegations of that character that they filed an answer in which they state as follows, — I read from defendants' answer (defts, i, 6): —

"Further answering, this defendant says: that Daniel Drawbaugh of Eberly's Mills, Cumberland County, Penn., was and is the original and first inventor and discoverer of the art of communicating articulate speech between distant places by voltaic and magneto electricity, and of the construction and operation of machines and instruments for carrying such art into practice; that, long prior to the alleged inventions by said Alexander Graham Bell, and long prior to the respective inventions of said Gray and said Edison, said Daniel Drawbaugh, then and now residing at said Eberly's Mills, constructed and operated practical working electric speaking telephones at said Eberly's Mills, and exhibited their successful operation to a great number of other persons resident in his vicinity and elsewhere; that the said electric speaking telephones, so constructed and successfully and practically used by him, as aforesaid, contained all the material and substantial parts and inventions patented in the said patents No. 174,465 and No. 186,787, granted to said Bell, and also contained other important and valuable inventions in electric and magneto-telephony, and were fully capable of transmitting, and were actually used for transmitting articulate vocal sounds and speech between distant points by means of electric currents; that some of the original machines and instruments invented, made, used, and exhibited to many others long prior to the said alleged inventions of said Bell, or either of them, are still in existence, and capable of successful practical use, and are identified by a large number of persons who personally tested and used, and knew of their practical operation and use, in the years 1870, 1871, 1872, 1873, 1874, and both subsequently and prior thereto; that certainly more than fifty, and probably not less than one hundred persons, or even more, were cognizant of said Drawbaugh's invention and use of said telephones, and of his claim to be the original and first inventor thereof, prior to the alleged invention of said Bell, or either of them."

Then on the next page it is further alleged: —

> "That the said Daniel Drawbaugh, after making, testing, using and extensively exhibiting his invention to others, and allowing them experimentally to personally test and ascertain its successful practical operation and utility, as aforesaid, and after the full and repeated demonstration of its successful working, as aforesaid, conceived that its range and capacity of usefulness to the public might be very greatly enlarged," and thereupon made additional improvements to "increase its value to himself and to the public."

Then near the bottom of p. 9, to meet directly the allegation made in the bill, that he was not a true and successful inventor of the speaking telephone, the answer alleges: —

> "That said Daniel Drawbaugh's original invention was complete, successful, operative, and practically and successfully operated and reduced to practice as a 'speaking telephone' on many occasions in the presence and hearing of many other persons, and knowledge thereof was freely communicated to the public by said Drawbaugh; and that said Drawbaugh's improvements, additional to his said original invention, were complete, successful and practical inventions; that all of his said inventions were fully reduced to practice and communicated to others."

That certainly states a defence.

We had put into our moving papers, not merely the date of the patents, but the date of Mr. Bell's invention as of the fall of 1874. In the face of that allegation, and obviously to meet it, the defendants allege that long prior to Bell's invention, and "in the years 1871, 1872, 1873 and 1874," Drawbaugh had a practical instrument, not only capable of transmitting, but which actually did successfully and practically transmit speech between distant points, in the presence of many persons; and that he freely communicated this invention to others. This is all admittedly false. The evidence does not profess to come up to that.

The statute requires the defendant, in a case like this, to state the names of the persons who had the prior knowledge or made the prior use, and the places where; yet the only name given, and the only place given, is the name of Daniel Drawbaugh, and at his residence. That is, he is the only person alleged to have had prior knowledge, and his residence the only place of the alleged prior use. I do not mean to say that that would disable the defendants from bringing other witnesses to prove that he did use them there, or that they assisted him in using the telephone, as it took two persons to use it; nor perhaps that others used it there in his presence or with his aid; but they could not, under that answer, prove use by other persons at other places. *They did not attempt to do so.* Although the allegation is that it was used for transmitting speech between "distant" points, and that the instrument with which that was done was "still in existence and capable of successful practical use," the most that he or any witness pretended to have done, was the transmission of sounds, whatever they were and whenever it was, between one part of his workshop and another; sometimes between one room and another, and sometimes between different ends of the same room. That is all The answer alleges "practical use." The strongest proof proffered is that there never was a moment of practical use in any proper sense. He never used them even for his own business, to communicate with his workmen, or with other people in the building, or for any purpose of utility. He kept them in a cupboard and from time to time took them out, — that is the story, — and connected them with wires, sometimes to wires standing in the building, and at other times to wires which he held in his hand, and talked from one part of the workshop to another to visitors who came in.

Now, we begin with this most persuasive allegation, that the instruments were "practically used" for transmitting speech between "distant" points; but it comes down to the use, in his own private workshop, from one room to another, to use the words of Judge Shipman in a recent case, "for the purpose of experiment, or to gratify curiosity," and never for anything else. That is not all. The anwser says "that some of the original machines and instruments made, used and exhibited to many others prior to the alleged invention of the said Bell, are still in existence, and capable of successful practical use, and are identified by a large number of persons who personally tested and used, and knew of their practical operation and use in the years 1870, 1871, 1872, 1873, 1874, and both subsequently and prior thereto."

They produced a number of exhibits, which they say were made during those years. *No set of instruments alleged to have been made during those years specifically named, is in such a working condition that it can transmit a sound;* parts remain; that is all. There is in fair condition one *receiver* (A) which is alleged to have been made in those years, and nothing else. It takes both a transmitter and a receiver to make a telephone. Out of all the instruments alleged to have been made in those years, or by means of all the instruments now produced as in existence at the date which we claimed in our papers for Mr. Bell's invention, or which are alleged to have been made in those years specifically named, it is impossible to transmit a sound of any kind, so destitute are they of proper working parts. They are wrecks and scraps. A defence resting on them is a scrap-heap defence. But that is not all. This thing never went to the Patent Office. No patent was applied for until the summer of 1880. Did it come into use? Let me read from the answer again. The answer says, in one passage which I read, referring to the use by others, that they used it only "experimentally." It further says (defts, i, 10): —

> "This defendant, further answering, says that so far and to such extent as electric speaking telephones were put on sale and into public use in this country, by others than said Drawbaugh, prior to said Drawbaugh's application for a patent thereon, as aforesaid, such specific machines and instruments, so put on sale and into public use, were not the specific machines and instruments invented by said Drawbaugh, as aforesaid, but were machines and instruments invented by others, subsequent to the original and first invention of the electric speaking telephone by said Drawbaugh, and subsequently to the invention of his said improvements thereon, as aforesaid; and that, as this defendant is informed and believes, such machines and instruments were so put on sale and into public use, not from or by reason of any information derived from or through said Drawbaugh, but by an inde-

pendent invention or independent inventions thereof by others, . . . and by reason of knowledge and information of their construction and operation not derived from or through said Drawbaugh."

Now we begin to get at the story which they undertake to prove, which is, that this man, for years before Mr. Bell's invention, had, as they say, instruments used only for the purpose of experiment or the gratification of curiosity, in his own workshop, and not for any other purpose, nor elsewhere; which now, so far as those which are alleged to have existed before Bell's *invention* are concerned, are mere wrecks incapable of use to-day; that he never took them to the Patent Office; and that although many people knew what he did, no instrument of his ever went into practical use; and no man, from all that he ever saw or learned of those instruments during all those years, ever learned how to make a telephone, or how to transmit speech, or did make a telephone, or did transmit speech in consequence of anything that Drawbaugh had ever done.

That is not the story which is set up in the answer, — there they tell a story which is colored to make a case, and the color is false; but the story they try to prove, stripped of the color which they admit is false, is a story that is very familiar to courts in patent causes.

There is one more thing I wish to state. We allege in our bill that this matter of Drawbaugh was not what led the defendants to make their telephones. It did not, even in the hands of the defendants, lead to the transmission of speech by them; but they had already made telephones, in forms of their own, which were mere colorable imitations or infringements of our patents; they learned how to talk from Mr. Bell; and after that, not for the purpose of using Drawbaugh's instruments, but for the purpose of using Drawbaugh's deposition, they hunted him up, and set up what he had done as a defence.

[*Intermission.*]

In May, 1880, three gentlemen, who are before your Honor in this case, Mr. Chellis of Harrisburg, store-keeper, who had been for about a year or a year and a half a partner of Drawbaugh in another invention upon which they were striving to get a patent,— an improvement in molasses faucets, — together with Mr. Jacobs of Harrisburg, the lawyer and counsel in litigation about that molasses faucet, and Mr. Hill of Washington, counsel also in part of that litigation, — Mr. Jacobs and Mr. Hill being the counsel who have had charge of the preparation of this case for the defence, and Mr. Chellis being a director of the defendant corporation, and himself an individual defendant; these three gentlemen arranged with Drawbaugh to take from him, and did take from him, three quarters of whatever pretension he had for any invention he had made relating to telephones; and for that transfer they paid him nothing, and they agreed to pay him nothing, except what might come out of their enterprise. They took three quarters of his pretensions, paying nothing, not agreeing to spend any money or do anything about it. Before the month was over, there had come to Harrisburg two men, one from Washington and one from Cincinnati, —Mr. Simon Wolf of Washington, and Mr. Moritz Loth of Cincinnati, — who negotiated with those three gentlemen for the purchase of whatever Drawbaugh had, more or less. They immediately consummated the purchase, and the consequence was, that in the course of a few weeks these pretensions, three quarters of which had been got for nothing, were resold to these parties for $20,000 in cash, and a large amount of stock, so large that the defendants decline to state what it was, except that it is a very considerable amount. A few weeks more passed, and these pretensions had blossomed from nothing into a corporation with five millions of capital. That is the defendant corporation.

Why did they want these pretensions of Drawbaugh? We allege in the bill, that these men, Simon Wolf and Moritz Loth, with two others, Marcus Marx and F. A. Klemm, had determined to put out telephones of a certain pattern which they were advised would be an infringement upon our patent; after which they bought up Drawbaugh's testimony, and the right to use his testimony to defeat our patent, and to protect themselves in that which they had already predetermined to do.

In the course of this case, the defendants put upon the stand, Chellis, one of these three men, the Harrisburg store-keeper; and Mr. Hill, another one of these men, examined him, and put to him this question (defts, i, 559): —

"*Int.* 106. When Mr. Wolf first came to you to negotiate for the purchase of the Drawbaugh invention, did he or not tell you that he represented a party who had already purchased the telephone inventions of Klemm and Tisdel, and were purposing to enter upon their manufacture and sale, and that they expected trouble with the Bell Telephone Company, who claimed to monopolize electric telephones of all kinds, and that they had already fully determined to test the validity and scope of the Bell patents, and the question whether the Klemm and Tisdel telephones were infringements thereof? What, if any, statements did he make on these several points?

"*Ans.* He did say something to that effect; it was in Mr. Jacobs' room in the hotel at Harrisburg, — I cannot recollect the exact words he said, — it was to the effect that they wanted to use it in evidence against the Bell Company — I mean they wished to use the Drawbaugh invention in evidence against the Bell Company."

I said before recess that the work which Drawbaugh did, whatever it was, never led to anything. It did not even lead to the existence of this defendant corporation, in a sense; it did not even lead to their infringing telephones, — they had made them, and afterwards, as a defence, they sought him out. He is a man whose work, whatever it be, has led to nothing except a defence to a lawsuit.

Look a little at the position of these two men, Bell and Drawbaugh, in the summer of 1880, when the defendants' newspaper proclamation came out. Do you want to know whether Mr. Bell had invented the telephone? Look at every instrument in every part of the world, which transmits speech by electricity; take every individual instrument; its history leads up to him as its origin, — actually leads up to him. In this country there were then one hundred thousand of them in use. Every one of them not only led up to him in a general sense, but they were actually manufactured and put into use by him and his associates constituting the Bell Telephone Company. He had done all that the law requires a man to do to get a patent; he had done all that which it is the object of the patent laws to have a man do, namely, he had disclosed to the world this great art of transmitting speech at a time when the world did not have it. No one else can ever do that again since 1876, when Mr. Bell did it; no man, be he prior inventor or subsequent inventor, could ever disclose that as a novelty. The community had no reason to offer the reward of a patent again, nor any longer, for it had got the art.

Mr. Bell had done more. Relying upon the patent which he had purchased by his disclosure of what he had invented, and which was given to him as a reward for that disclosure, he had taught this art to the public; under the promise of the patent he had made the disclosure, and under the promise witnessed by the seal of the United States, the public had got the benefit of it. He and his associates, relying upon the promise and the grant so earned, had gone on and added to his invention the many improvements due to the genius of subsequent inventors, together with their time, skill, capital and business experience. There were 100,000 instruments in this country. Think what that means; think of the capital which had gone into the business, and of the thousands and thousands of miles of wire that implies. That is what he had done. That was what the community owed him for, and had promised to pay him for. All that the patent can give, he and his associates have earned and paid for.

What have these other men done? Their instruments and their ideas, whatever they were, have led to nothing, taught nobody anything, and were used solely for the purpose of experiment, or the gratification of curiosity. If they had not existed the community would have had speech by electricity just as soon as it did. That is not an entirely new story. When that kind of story is presented, when such a patent as this is presented on the one hand and such a story as this on the other, — not the story of the answer, but that which I have stated, — such a defence against such a patent has always failed. Why? The pretender says, "I did not earn the patent; you earned it. I did not communicate the information; you communicated it. You earned the reward. What have I done? Nothing for the community; but *I have found a flaw in your title, and I want your property.* I have sat by for four years, until I have seen these lines of telephones and this great property grow and grow and grow, and money — your money — go into it, and now I have found *a flaw in your title*, and I want that property turned over to me. I want possession of all the telephones in the world, or else to be able to wring from the Bell Telephone Company a 'magnificent tribute' for the privilege of keeping what they have earned and paid for." Is that a case which will recommend itself to the court of equity?

Such defences have always failed for a hundred years, not merely because they do not recommend themselves to a court of equity, but *because a Court does not believe that kind of a story against that kind of patent.* The courts have again and again laid down the rules by which they are to be governed in these controversies. If I had time, I should like to read to your Honor a few of the authorities. They are collected in our brief, pp. 97–133. These authorities are not merely to the familiar rule that there must be a practical instrument, a successful instrument, but to the kind, the value, and the character of proof required to establish such a defence in such a case. One and all, they hold that it must be made out by proof that leaves no doubt on the mind of the judge; it must be clear, distinct, unmistakable. To doubt is to dismiss the defence, said one judge. "Every doubt must be resolved against the party who sets it up," said the Supreme Court. That is not all. What kind of proof is to be brought? Do you rely mostly upon the recollection of men who say that years ago they saw or heard of such a thing? The courts have decided over and over again that the only proof that is worth anything in such a case, where you have to go back a series of years, is proof of results, proof of consequences, proof of conduct. For the courts know that if a man had such a thing as a speaking telephone, something would have come of it, — it would have been heard of and in every sense; the courts look upon the conduct of a man, or his surroundings, what he did, what such things led to, not as evidence making the story more or less probable, but as the best and the only positive, direct and unequivocal proof for or against the fact; not as raising a question of probability, but as absolute proof. That is not all. They look upon the facts of a man's conduct — not to what the man says he did, but to what resulted from it — as the only proof satisfying to the mind in a contested case of an invention where the claim is brought forward at a late day.

Your Honor knows the case of Atlantic Works *v.* Brady, 107 U. S. 203. There nobody specifically contradicted, and nobody was able to specifically contradict, what Brady and a number of witnesses swore to. Yet the Court said that his conduct, "what he did and did not do," and his silence in his intercourse with his associates, were such evidence that no recollections and no depositions of men who say that he disclosed and described to them his invention could weigh against it. As a matter of law and public policy, the Court cannot rest on such evidence. Your Honor knows one of the earliest cases, that of the cotton gin, where men swore that they had seen the cotton gin and used it. The Court said there were facts known to everybody which far outweighed that. All those authorities have been collected in the brief (p. 107 *et seq.*), but I shall not stop to go over them.

There are one or two rules of proof which are important. Lord Mansfield laid down a rule which has been enforced by the Supreme Court in a great many cases, "that the evidence is to be weighed according to what it would have been in the power of one party to have produced and in the power of the other to have contradicted" (brief, p. 129). When evidence tending to support an issue of this kind produced by the party upon whom the serious burden rests, though of itself persuasive, yet falls far short of what the truth would furnish if his story were true, the courts do not look upon it as evidence tending to prove his case, but as tending to disprove it. If the evidence, however it tends to support his story, is far short of that which the truth of his story would have created and brought before the Court, the Court say that the fact that his evidence does not come up to the full measure of what the truth of his story would furnish is proof (if I may use the expression) that it does not fill the bill, does not come up to what the party would have produced as evidence if his story had been true.

But that is not all. These rules of proof are rules which are not merely laid down as suggestions for the Court, they are rules which a Court has got to follow, rules which come up almost to the binding effect of the statute of frauds; they have acquired a standing and position where the doctrine of *stare decisis* applies. Parties rely upon them. That is not all. It is not merely that, but parties make their arrangements relying upon the faith that the courts will follow them. Defendants prepare their cases in view of them, and if this defendants' record does not come up to what the rules require, it is because the facts will not permit it, not because they did not know what consequences would follow their failure.

What I am to deal with, and what I am to spend a little time on now, in my part of this case, is not so much a conflict of testimony, as where a man says that on one day he saw something, and another man says that being there on that day he did not see it; but what I now wish to set forth is this man's history, — in the language of the Supreme Court, his conduct, — what he did and did not do, and then ask your Honor whether, in that history, you can find a speaking telephone. If you cannot read it in his life, it is of very little use to try to read it in his deposition. I shall not deal with disputed facts, but with certain uncontroverted facts found in the defendants' volumes or proved by writings. Why was it? How can it be? How can you reconcile the story they have told of perfect speaking telephones for years and years and years, — instruments known to many people, — hundreds of people, — perfect speaking telephones, they say, — with the *facts* that no one used them, no one carried them to the Patent Office. There is one excuse, there is one explanation proffered in the answer, and only one offered in the answer, which I will read as they state it. I read from p. 7 of the answer: —

> "That said Drawbaugh for more than ten years prior to the year 1880 was miserably poor, in debt, with a large and helpless family dependent upon his daily labor for support, and was for such cause alone utterly unable to patent his said invention, or caveat it, or manufacture and introduce it upon the market."

Then in another place they allege, —

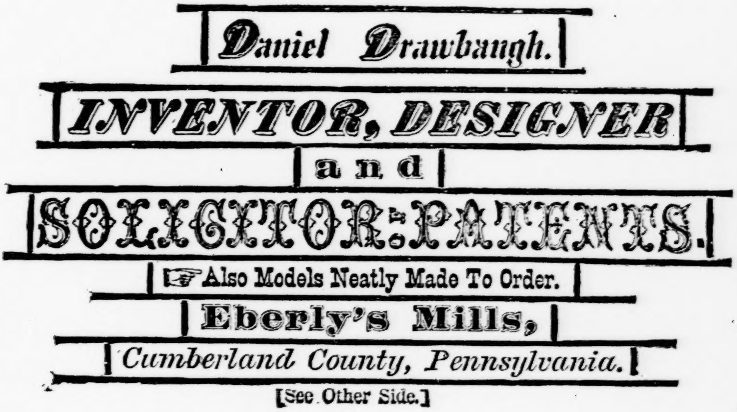
> "His utter want of proper mechanical tools, materials and appliances."

What do they mean by that allegation? Do they mean that, having conceived the invention, he was not able to reduce it to practice? We have heard of that in other patent cases; but that is not what they state here. For if they came here and stated that he had never reduced this conception to practice until after the telephone had been heard of from Mr. Bell, that would not be even a plausible case to aver to a court. Their story and their evidence, if believed, are to the effect that he devoted years and years of labor to it, made instrument after instrument, reduced the invention to practice, made perfect instruments, that he had the time for that, the materials for that, the tools for that, the means to support himself while he was spending years and years on this thing which produced no profit, — but their explanation is, that, when he had made a perfect speaking telephone after years and years of labor, he did not have the time or the means to make one more pair, duplicates of the last, to take over to Harrisburg, three miles off, and sell. That is the story. It is not the story that poverty prevented him from reducing them to practice, but that poverty had prevented him from using them after he had made them and reduced them to practice. Such a story is false on its face; but it is also disproved by the undisputed facts of his history. I am going to show from his own deposition, from papers, that he had plenty of means, plenty of materials, plenty of tools within his reach, and also plenty of rich and influential friends.

Perhaps I cannot begin better than by stating that in the summer of 1879 he gave a deposition for himself, in his own behalf, under the care of Mr. Jacobs, his present counsel, in an interference pending in the Patent Office between himself and a man by the name of Hauck, on an improvement in molasses faucets. In the course of that deposition he was called upon by his own counsel to give some testimony in the nature of expert testimony; the other party objected to it; his own counsel qualified him as an expert by having him swear that he had been making inventions all his life, that he had patented a good many of them, and had acted as solicitor of patents for other parties, not to a great extent, but in some cases, enough to show that he was familiar with patents and the way to obtain them. (See our brief, p. 196, and complts, iv, exhibits, p. 123.)

It was quite incredible that such a man could have had an actual speaking telephone for a dozen years and not have patented it. It was so impossible to reconcile the story with the fact that they thought it best to have him deny the fact, though he had once sworn to it. So he was put upon the witness stand, and denied that he ever considered himself capable of drawing a patent specification (brief, p. 197, defts, ii, 900); but afterwards a printed card was gotten hold of which he printed, and which he has never ventured to deny. We called the printer, put in the card, and since then he has never ventured on the witness stand.

There is the card. That card was published not earlier than



Daniel Drawbaugh.

INVENTOR, DESIGNER

and

SOLICITOR:PATENTS.

☞ Also Models Neatly Made To Order.

Eberly's Mills,

Cumberland County, Pennsylvania.

[See Other Side.]

the summer of 1874, at a time when, according to his story, he had had electric speaking telephones for six or eight years; at a time when for eight years he had been spending most of his time upon them, when, according to his own story, he was very poor; at a time when for years and years he had announced to his friends that the speaking telephone was the greatest invention in the world, and a fortune to any man who could bring it out, — if you believe what they want you to believe. There is his card —" INVENTOR, DESIGNER, SOLICITOR OF PATENTS." That is not all: he is a model maker, "MODELS NEATLY MADE TO ORDER." That card was published at least as late as the summer of 1874, and another edition after that (brief, p. 196; complts, ii, 1212, ans. 10). If this man's story be true, he had had for years and years the electric speaking telephone, which was the greatest work of his lifetime.

But that was not all. Some time, about 1875 or 1876, he printed a bill-head; it is in the record, and here is a photo-lithographic copy of it.

________________ *Cuml. Co., Pa.* ________________ *18*

M ________________________________

Bought of DAN. DRAWBAUGH,

PRACTICAL MACHINIST,

Small Machinery. Patent Office Models, Electric Machines &c. a specialty.

Now, what do you think of a man, —a model maker, a professional inventor, a professional patentee, —making the construction of electrical machines a specialty, and so advertising in print; who had a speaking telephone for ten years, and never made a practical use of it, never patented it, never made one for practical use? But that is not all. In that card, calling himself an "inventor," he puts, on the other side, a list of those things upon which he chooses to rest his claim to that title, — a list of sixteen or eighteen inventions, and contrivances, — *but no telephone among them.* Here is the other side of the card: —

Dan'l Drawbaugh,

INVENTOR OF

THE FOLLOWING PATENTS.

Stave, Heading & Shingle Cutter.
Barrel Machinery.
STAVE JOINTING MACHINE, Many in use.
Tram & Red-staff for leveling face of Millstone.
Rine and Driver for running Millstone.
Nail Machinery for Feeding Nail Plates.
PUMPS, ROTARAY & OTHERS.
Hydraulic Ram.
THE DRAWBAUGH Rotary Measureing Faucet. very extensivly used.
CARPET RAG LOOPER-- A little device by which rags are looped quick and firm, without Needle or Thread.
ELLECTRIC CLOCK.

MAGNETO ELECTRIC MACHINE,

For short line Telegraphing. Fire Alarm, and Propelling Electric Clocks. It can be applied to any form of Electric movement. Gives entire satisfaction USEING NO *GALVANIC BATTERY.*

☞ **For SIMPLICITY it has NO RIVAL.**

That is the story which he told in print, in the summer or fall of 1874, and again in 1875 or 1876. How many recollections, how much oral testimony, does it need to satisfy the Court beyond any possible doubt, that six years or eight years before that, the speaking telephone was the greatest ambition of his heart, made, completed, working successfully, not kept concealed, shown designedly to everybody; in the language of the answer, "freely communicated to the public," and left out of that list! Was it poverty that would account for the printing of that list *with the telephone left out*, if he had one? That list is a list of his inventions. It says on the other side "Patents"; which means a patent in the same sense as a paragraph which I read from the newspaper this morning, and in which it is frequently used in this record. It is a list of his inventions. Only about one half of the things in that list were patented. He was not manufacturing them; he did not own those patents, he had sold them; it was a list of inventions, a list of contrivances which he published to the world in order to show to the world the scope of his genius — if he had any, whether he had a right to advertise himself as an "INVENTOR"; and he left out the telephone — if he had one.

Well, may it please your Honor, after that I want to show the instruments. While the instruments are being brought out, I may as well state one fact, which will be shown more fully hereafter. In 1867, his partners in business fitted up an expensive machine shop in his village at a cost of about $20,000; it was run by water power. From that time he has had the right to occupy that shop and use that machinery rent free, and has done so.

I ought to say that the plan which I have marked out for myself is not so much to comment on specific facts which are disputed on the one side or the other, as it is to array before your Honor the history of this man, — incontrovertible facts, drawn from the papers or drawn from his own depositions, leaving to your Honor, without comment or argument from me, to judge of the weight and value of the facts upon the main question of the case.

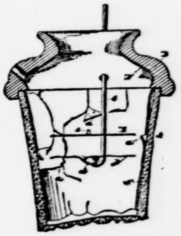
The defendants, at the outset, recognize that the fact that he never put an instrument into use, and never went to the Patent Office, is a fact, or a set of facts, which goes very much against the belief that he had an instrument fit to be put into use, or to be carried to the Patent Office. They therefore seek to bridge over this chasm by these allegations (and it is the only explanation by which they try to bridge it over) of want of tools, want of money, want of resources. In the first place, as I have already stated, so far as want of money goes, we shall presently show that it is not true, according to his own deposition. If that were the excuse, it would not meet the circumstances of the case; it does not meet, for example, the allegation that he had made a perfectly good telephone, but could not make one more pair to put into use; it does not meet the fact that in printing this card, he gave a list of sixteen inventions, and did not mention a telephone. It does not meet a good many other facts.

Upon the question of tools, I was going to say that in the spring or summer of 1867, his partners embarking in business with him upon an invention which he had made and just patented, furnished a machine shop in his own village with $15,000 or $20,000 worth of machinery and put him in charge of it; and that machinery, though changed from time to time, substantially remained there down to the time when this controversy began. He had the free use of that machinery, driven by water power, without rent; the machine shop and the use of a private room for himself, from that time for thirteen years after he began, without any rent. Now when you find that fact in his own deposition, with no controversy about it; when you find the fact announced on that card, that he not only made models, but especially made electrical machines, there is an end of all pretence about want of tools — except the effect which this proof has on the men who swore to such a pretence.

The instruments produced by the defendants as exhibits are now placed on the desk before your Honor. Here, on this side, are the instruments, or the remains of the instruments, which they allege were made *before* the date of the Bell patent (March 7, 1876) and in the following order: **F**, the remains of a broken tumbler; **B**, the remains of what we call the tin-can instrument; **C**, the remains of a sort of breastwork instrument, something like the top-sides of a ship; **I**, the remains of an instrument something like a cuspidor; **A**, this round, flat instrument with a brass bracket at the back carrying the magnet and a mouthpiece near one edge of the flat side; then these two small magneto intruments **D** and **E**.

On the other side of the desk are certain exhibits alleged to have been made *after* the date of the Bell patent (March 7, 1876), **L** and **M**, which are about alike; **G** and **O**, which are about alike; **H**, which is the large tall instrument with a sloping front and a bell on top; **N** and **Q**, small magneto instruments; **J**, which is a large instrument in an oblong box; **P**, which is a shield-shaped board, with a long rubber tube ending in a mouthpiece, coming from it near one edge, and a short wooden tube and mouthpiece about an inch long near the other edge of it; then **K**, this small round black-walnut instrument, with a little brass handle projecting from one side.

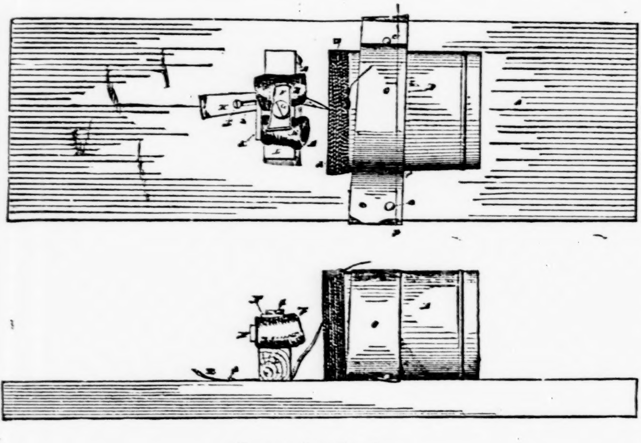
The allegation of the defendants is that **F** and **B** are the earliest in date of these. **F**, the broken tumbler, is alleged to have been a transmitter, and **B**, the tin-can instrument, is alleged to have been a receiver. Your Honor appreciates that it requires two instruments to make a telephone, properly so called; that is to say, the apparatus which is to transmit speech must have a transmitter at one end, a receiver at the listening station, and a line wire to connect the two. The defendants' story is that the first apparatus among all those produced consisted of **F**, the tumbler, at the transmitting end, and **B**, the tin can, at the receiving end. The tumbler **F** is alleged to have been a variable-resistance battery transmitter; that is, one in which the motion given to the diaphragm by the voice, served to vary the resistance of a circuit through which a battery current was passing, and thus produced undulations in the current, in the manner which I described this forenoon. It is not alleged that it had *hard* contact pieces. The construction which they allege for it was different from anything I have described, but it is alleged to have been a battery instrument which operated by varying the resistance of the circuit. This broken-tumbler instrument is a wreck, as you see. It is alleged that the instrument was either made out of a broken tumbler, or that the tumbler was broken soon after, and used in that condition ever afterwards; that it had a diaphragm of bladder tied over the top of the tumbler; that to that non-existing diaphragm there was attached a wire, not now in existence, which, it is said, ran down to this plate which appears



F, one fourth size.

as the upper plate in the cut. It is alleged also that the stiff brass wire which goes through the cap piece, and carries a plate about as big as a quarter-dollar, at its lower end, had a box around that plate, containing some powder of some kind. You see that this instrument is not only not a speaking telephone now, but it has not the parts which are essential to enable it to transmit any sound, if it was ever made as they allege. The construction of the original instrument must therefore rest on memory.

This tin-can instrument **B** is alleged to have had a bladder tied over the end of the can, where you still see the remains of a bladder.

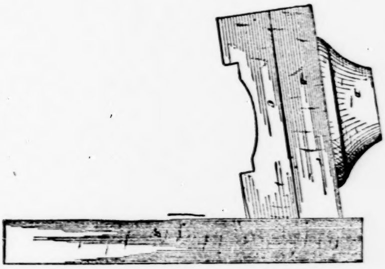


B, one fourth size.

It is alleged that to this non-existing bladder there was secured near its centre a piece of iron as an armature, which also does not now exist; that in front of that armature, and substantially in its present position, was arranged on a wooden block an electro-magnet. It is said that the one now on it was one that was used on it at a certain period, not the only one that was used on it — so they say. When the undulatory current produced by any proper transmitter comes to such an electro-magnet as this, it passes through the coils around the iron horseshoe and by its varying strength varies the magnetism of the cores, and the horseshoe thus attracts the armature more or less; and this alternately pulls in the diaphragm and allows it to retreat, moving it, vibrating it, as I explained this morning in the case of another receiver. It is alleged that this was so arranged and contrived as to act that way.

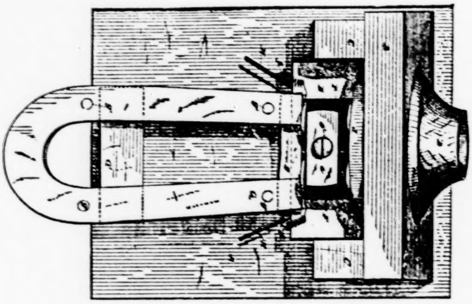
F, the broken tumbler, is alleged to have been a transmitter, and **B** is alleged to have been a receiver; and it is said that these two were made to be used together as the first set of which any remains existed. It is alleged that they were made in 1867; indeed, one of the witnesses, Snell (defts, iii, 412), says that he listened at **B** in the first half of 1867. The defendants have made what they call reproductions of these. I shall by and by show that what still exists in these exhibits shows that the originals never could have been like those so-called reproductions. Here are the so-called reproductions on the clerk's desk, marked "F reproduced" and "B reproduced."

The defendants say that the next pair which Drawbaugh made were the breastwork instrument **C** and the cuspidor instrument **I**. The breastwork instrument **C** lacks operative parts: here is a mouthpiece; here is now on it a diaphragm; it is alleged that in front of, or perhaps I should say, behind that diaphragm there was placed an electro-magnet, and behind that a large heavy horseshoe magnet, the poles of which were in contact with the cores of the electro-magnet. If it were so constructed, it would, in theory be capable of operating after the manner of a magneto receiver or of a magneto transmitter. This instrument on the clerk's desk is alleged to be a reproduction of it, with the parts of the reproduction which are not in this exhibit **C** supplied from somebody's memory.



C, one fourth size.

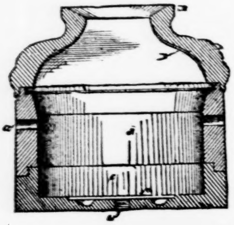
The Court perceives that this so-called reproduction is of the same character as the magneto instrument I described this morning. It has a diaphragm supported at its edges; in front of that an electro-magnet with soft iron cores, and still in front of that a heavy permanent horseshoe magnet. When the latter is placed in contact with the cores of the electro-magnet, its magnetism, so to speak, flows into the cores of the electro-magnet, and the latter become magnetized for the time being; and therefore it can operate either as a transmitter or a receiver in the way I described this morning.



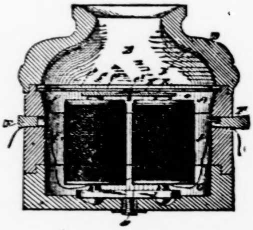
" C reproduced," one fourth size.

This cuspidor-shaped instrument I, when produced and sworn to in this case by the earlier witnesses, consisted of nothing but the walnut shell; it had no inside works at all.

The defendants have since taken the liberty to place in it a diaphragm while the testimony was in progress, which was not in the original; they have also placed in it a magnet which they say they



I, one fourth size.

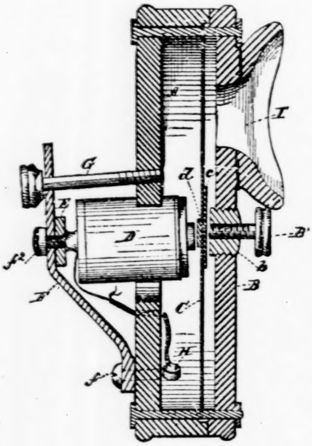


" I reproduced."

found in Drawbaugh's garret, and which they conjecture may have been used in it before, because they say it fits, though really it does not. It is worth noticing that the witnesses who pretend to identify this instrument swore to it just as freely when it was a mere shell as they did afterwards when the works were placed in it; and they have since identified it as positively as they do any instrument, although the diaphragm of it — one of the essential operative parts —has been made, constructed and placed there since we began to take testimony. All these witnesses are perfectly ignorant men, and know nothing except the looks of the outside of the box, even if they do that.

It is obvious therefore that any knowledge which the Court may have of the interior of these instruments, that is, of parts which are not found in these wrecks, must rest on Drawbaugh's memory alone, with perhaps some little help in some particulars from some of the witnesses.

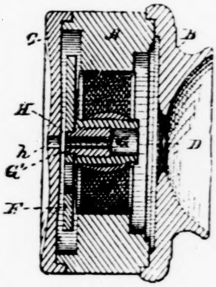
This instrument **I**, as it is found here, contains inside simply an electro-magnet with unmagnetic or, as we call them, neutral cores. It is alleged by the defendants that after a time Drawbaugh took out that electro-magnet and placed in it a somewhat smaller one, with a pair of horseshoe magnets at its back end to magnetize its cores. In that condition, when the cores were magnetized it would become a better receiver, — I speak to you of its theoretical operation, not whether it is good enough to work, — and could also theoretically be used as a magneto transmitter, generating currents by the vibration of an armature carried on the diaphragm in front of an electro-magnet in the way I described this morning. It is alleged that these instruments — **C** and **I** — were made about 1869 or 1870; that **C** was made a few months before **I**; that each of them were made with neutral electro-magnets merely, to begin with, and that afterwards the permament horseshoe magnets were added as an afterthought. The addition of permanent horseshoe magnets to such an instrument constitutes an important improvement; it is one of those covered by Mr. Bell's second patent; it does not change the nature of the operation, but it improves the instrument.



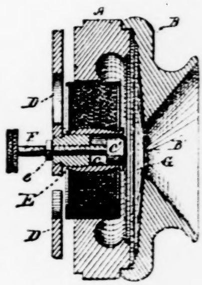
A, one half size.

The black-walnut instrument **A** is alleged to be the next in order. It is the round, flat, rather thin instrument, about five inches in diameter and an inch and a quarter thick, with a brass bracket at the back carrying an electro-magnet, and an oval shaped mouth piece near the edge on the opposite side. It is not worth while to take it apart; there are some illustrations of it in the book, which your Honor can examine. The Court will see the long black line C, which is a diaphragm. The diaphragm is of wood, which of course is no more a magnetic material than bladder; but fastened to the centre of that diaphragm is a piece of iron, *d*, to serve as an armature. This instrument is a receiver only, because, as the electro-magnet has neutral cores, the vibration of an armature in front of them will not generate magneto currents. When from a proper transmitter the undulatory articulating current reaches this electro-magnet of **A**, and passes through these coils, the magnetism of this core is altered in accordance with the variations of the current, and the diaphragm is correspondingly vibrated; and when the earpiece is placed to the listener's ear, he will hear a corresponding sound. That, I say, is the theoretical operation of the instrument; and in point of fact, with a good transmitter, this instrument makes a very respectable receiver; it is in fair working condition, and is good enough to be practically used for that purpose if there were no better instrument. It is an instrument, however, which requires a battery; you cannot use it in connection with a mere magneto transmitter; and the allegation for the defence is that it was used as a receiver with **F**, — the broken-tumbler instrument as a transmitter. Drawbaugh's story is that it was not so good an instrument as **I**. The Court will see that its workmanship is quite neat and nice. It is alleged that this instrument — as I understand it — was made in the fall of 1874.

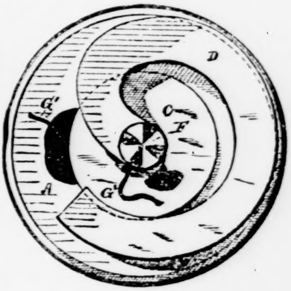
Next comes this pair of instruments **D** and **E**, small magneto instruments.



E, section.



D, section.
One half size.



D, rear view.

They are substantially, alike. I may say, exactly alike; the only difference is a slight change which was made in one of them in the interior cavity of the wooden case, which obviously would be, and which Drawbaugh says he found to be, no improvement and no injury: it was quite immaterial. **E** has a wooden bottom or cover you will see on the back; **D** has none; evidently from the rabbet in the wood there was one and it has been lost; its loss exposes to view the rather peculiarly shaped "curled magnet," as it is called, in the case, in the form of a snail. The instrument **E** contains just such a magnet arranged in just the same way, but it is covered by the wooden bottom or cover. These are very highly organized instruments, and their workmanship shows that the man who made them was a neat mechanic.

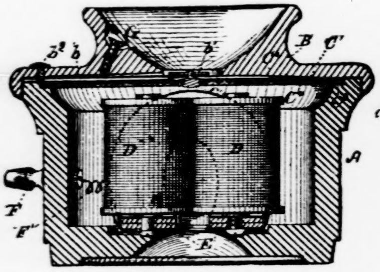
I will enumerate some of the details of these two instruments. The Court will remember that the magnetic changes which are essential to the transmission of speech take place not far from 2,000 times a second, that being somewhere about the period of duration of a vibration due to what are called the "overtones," and upon which the quality of the sound, that is, the distinction between one word and another, depends. It is obvious that the instrument, in order to respond to these slight and rapid movements, must be able to change its magnetic condition with the utmost rapidity. It is found that a very short core with a coil, short but large in diameter, was for this reason more effective than the long and large electro-magnets commonly used up to that time in telegraph instruments. It was also found that a magnet applied to the rear end of the core, I mean a permanent steel magnet which thus kept the core constantly magnetized, increased the excellence of the instrument, because under such conditions the core and the diaphragm are more sensitive and quick to respond to small and rapid changes. This instrument has a metal diaphragm which is much better than a bladder. Your Honor will recognize also the form of this mouthpiece. In the broken-tumbler instrument **F**, and in the instrument **C**, and in the cuspidor instrument **I**, and the tin-can instrument **B**, there was a great cavernous space between the exterior air and the place where the diaphragm is alleged to have been — a cavity.

In these instruments, **D** and **E**, you see the small flaring mouthpiece with the rather small hole in its centre, which opens into a cavity of the full diameter of the diaphragm, extremely thin, — the sixteenth of an inch or thereabouts. I take off the cover to show the interior of this mouthpiece, and you see that it is exactly the same as that of the ordinary commercial instruments which I showed you this morning. This thin air space and central opening — we are not quite sure exactly why — are great improvements over the large cavernous space of such an instrument as **C**, for example; and since Mr. Bell invented it, this has been universally used in all telephones everywhere. These niceties of detail, to wit, the short core and coil, the permanent magnet on its rear end, the metal diaphragm, peculiarly shaped mouthpiece and air space, are great improvements; they betoken an advanced state of the art; they are covered by Mr. Bell's second patent. In practice, Mr. Bell found, after a while, that he could carry these forms to a great excess with advantage, and the forms in commercial use exhibit these features in a very marked degree. Experience showed just how far he could carry these improvements and gain. These two instruments, **D** and **E**, contain all of them; they are refinements which come from a high state of the art; and whoever first made the instruments with all these little refinements had got a good ways along in the art, — must have had a long and varied experience with many instruments, — in fact, so far along that the best modern receivers of to-day contain no feature which is not in these two instruments. I ought to qualify that a little. These two instruments D and E are weak. It is essential that the core of soft iron should be highly magnetized, as nearly saturated as possible, with as much magnetism as you can get into it.

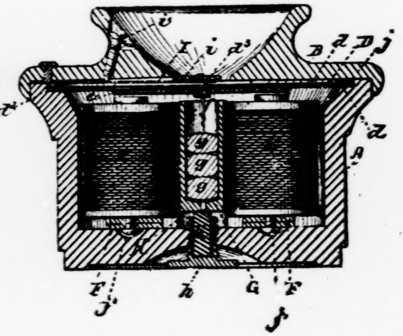
Now, if you attach a very large steel magnet to a very small core, there is magnetism enough in the large mass to flow into the small, soft iron core, and, so to speak, fill it; but if you apply a large core of neutral soft iron to a very small steel magnet, the magnetism will, to use an expression picturesque rather than scientific, be so diluted in the attempt to fill the large core, or, rather, so insufficient in amount to fill and saturate it, that the contrivance will be weakly magnetized. This core that I speak of is inside the coil. It is a small piece of soft iron, perhaps a quarter of an inch in diameter and an inch long. Now the defect I have spoken of, that is, the smallness of the permanent magnet, which you will see is not more than one sixth as large as that of the commercial telephone, makes these instruments weak; but it would not prevent their talking well enough to be heard on a short line. The defect is one in proportion but not in principle.

These are all the instruments which they allege were made before the date of the Bell patent (March 7, 1876). They are described at length in the brief, pp. 136–144.

The defendants' allegation is that L and M were made after the Bell patent; then G and O, then H, then J, N, Q, P, K. L and M are magneto instruments to-day; they do not differ in principle from D and E; I should say that they were a step backward from D and E. They have the metal diaphragm and the thin air space and a mouthpiece as in D and E, but they use two cores, that is, a horseshoe magnet instead of a single core, which experience has shown to be not quite so good; they have larger electro-magnets, which experience has shown to be not quite so good, and the permanent magnets which are to magnetize these much larger cores are very little larger, though somewhat, than in D and E. That is what the instruments are to-day; when they came into this condition is another question. The defendants' story is that L and M originally were in a different condition; that when first made these two magnets of **L** and **M** inside were farther apart, and between them was placed a microphone, just such a microphone as is now in **G**, so they say. Their drawing "**L** reproduced" shows the condition in which they say these instruments **L** and **M** were first made.



L, one fourth size.

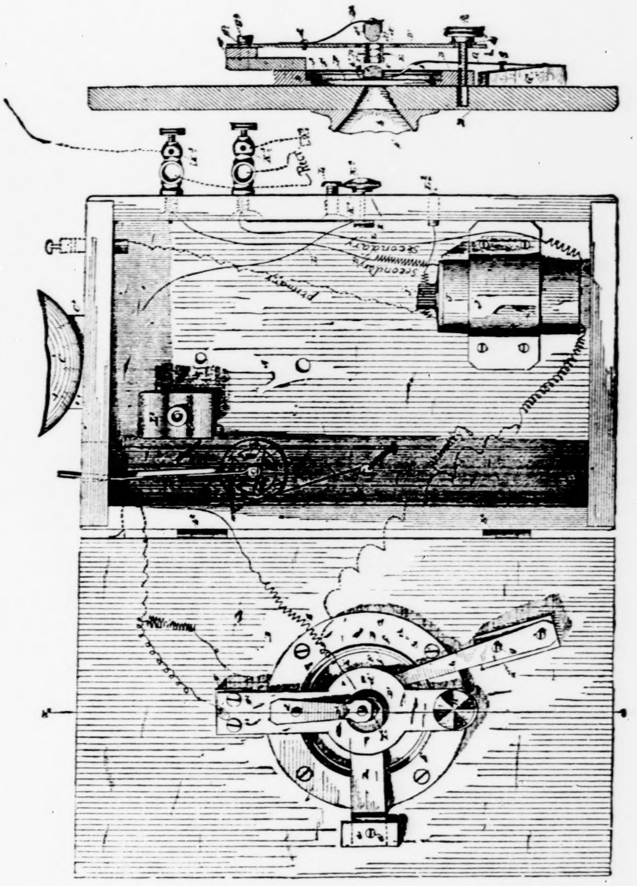


"**L** reproduced."

This microphone arrangement consists of a small wooden tube perhaps a quarter of an inch in diameter. In it are placed two or three carbon balls; in fact, they are flattened down a little like a lentil. One of them, nearest the diaphragm, is connected with it in such a way that the diaphragm as it vibrates presses more or less on that; the rear one rests against the body of the frame which carries the edges of the diaphragm. Thus, when the diaphragm vibrates, it presses these carbon balls more or less together in the way I have described to you about the microphone this morning; and a battery current flowing through them experiences the varying resistance and is thrown into electric undulations similar in form to the sound waves; that is to say, such is the theoretical operation of the contrivances.

I said that the rear carbon ball farthest from the diaphragm was supported on the frame of the instrument, but between the frame and that rear block is placed a spring, either of metal or rubber, and an adjusting screw; the object of the adjusting screw is to secure exactly the right initial or normal pressure, a thing quite indispensable to make such an apparatus work at all, while the effect of the spring is to enable variations of pressure to be produced with less liability to break the contact and interrupt the current, — a disaster which, as I have described this morning, is for the time being fatal to the transmission of speech.

Of all materials which have ever been used for microphone contacts, it is found that hard gas carbon, smoothed, and either alone



or in contact with platinum, one or both of the surfaces being rounded, is the best as material and as form; and it is found that a spring backing and an adjusting screw are practically necessary to reach good results in nearly all microphone instruments of this type.

These features are found in G, and are alleged to have been found in L when it contained the microphone. G and O and L and M, therefore, were very highly organized instruments, with many of the best modern refinements. They lack, however, one feature, which is very important, and which I have already spoken of, and that is, a weight attached to the back electrode. Still, G is an instrument which can be practically used in really skilful hands. The Court sees that it is a very neatly made instrument; there is in it not only good workmanship, but its shape and arrangement indicate a nice, and I may say a very fastidious workman; it is rather graceful, and considerable pains have been taken to give it an ornamental shape.

The next instrument in the defendants' chronological schedule is this tall large instrument with a sloping front and a bell on top, H. It is a microphone, but of a very highly organized character. It has a wooden tube with some carbon balls inside of it as G had, but the outer carbon, D^2, instead of being arranged with a small screw and rubber block to press it up, is carried on a long and delicate brass spring, which itself is carried on a long lever held at one end on an ear-piece which projects out from the iron ring, and furnished on the other with an adjusting screw. That arrangement enables a very nice adjustment to be secured and great delicacy of contact obtained.

The diaphragm is carried on this cast-iron ring, which itself is screwed to the cover of the box, which the Court sees when I shut the box; and a section in the drawing shows it also. The cover of the box has a mouthpiece terminating in a small central opening which leads into the large and thin air space like that already described in other instruments. On the inside of the cover also is this long finger-shaped spring of steel screwed to the cover of the box, with the free end of it pressing against the diaphragm near the centre. Its function is said to be to "dampen" the diaphragm. It is desirable to have this done, though not very important. Inside of the box in this little tin can is what is called an induction coil. It is not necessary for me to describe that, but it is a contrivance which, while it does not change the nature of the operation performed by a microphone transmitter, greatly increases its range and power when it is desired to use it over a line of any considerable length.

I open and place alongside of it the Blake transmitter, which I described this morning. Every feature which your Honor can see in the Blake transmitter is found in Drawbaugh's instrument **H**. Even the details of the structure — the way the things are mounted — are the same in both. The diaphragm of each is carried in a cast-iron ring, secured to the swinging door of the box; the mouthpiece is formed in that wooden door; there is a spring firmly pressing against the diaphragm; the back electrode, or anvil electrode as we sometimes call it,— this rounded piece of carbon,— is carried in a little brass cup piece which itself is fastened at the end of a delicate spring, the other end of which is attached to the long swinging lever fastened by a spring, hinged at one end and provided with an adjusting screw at the other. The induction coil is arranged inside the body of the box. The resemblance, as your Honor now sees it, is perfect.

They are different in size and there are some little differences in the details, but if a good workman had seen one without taking it to pieces, but merely looking at it for a few minutes, he could and naturally would be able to go home and make the other. But there are two things which are in the Blake transmitter and are not in Drawbaugh's instrument **H**, and they are the most valuable things in the instrument. When I described the Blake transmitter this morning (p. 27, *supra*), I pointed out that the variations of pressure which caused the variations of current were due to the fact that the quick-moving diaphragm pressed against the weight of this back electrode, or anvil electrode *c* as we sometimes call it, and that owing to the inertia due to the weight of the latter, its indisposition to get out of the way quite as quick as the diaphragm pushes it, pressure is developed at the point of contact; and it is that very pressure which makes the instrument a transmitter. To make it work well that way, it is essential that the anvil electrode should have a certain weight. The pressure of a spring will not take the place of a weight; and the excellence of the Blake transmitter is very largely due to the presence of that weight. The thing can be made to talk without it, but not with any degree of satisfaction; if the weight is not there, the slightest change in the volume of the voice makes the thing break, and it ceases to talk intelligibly. In the Blake transmitter you see that the delicate spring which carries the back electrode is one which ends in a brass cup about half an inch in diameter, carrying on its face towards the diaphragm the black piece, which is polished gas carbon; it is weighted; it has lead or something inside of it and weighs about seventy-five grains. In Drawbaugh's instrument H, the back carbon d^3 is also carried in a brass cup d^2, carried on the end of a similar long and rather delicate spring D^2, *but the weight is left out.* All that one can *see* in looking at that part of the Blake, even to the manner and material for holding the carbon, is in Drawbaugh's instrument, *but the weight, which is the soul of the whole, is left out.* You cannot see that; you see the outside of the brass cup, and you do not know, unless you have studied the instrument and really understand such things, that it is weighted.

Again, look at the spring finger which presses against the diaphragm. That is in both instruments. In making the Blake transmitter, Mr. Blake discovered that it was a great advantage to have the diaphragm free and untrammelled at its edges. In the earlier instruments of other constructors, the diaphragm was screwed hard to the frame. Mr. Blake found that it was better to rest it simply in a recess and hold it in place by a spring finger. I do not think your Honor noticed that when I showed you the Blake transmitter. You saw the cast iron frame, you saw the diaphragm supported by it, and you saw the spring finger, but you did not see that the diaphragm was loose and supported only by the spring finger, nor understand that that arrangement is the real reason for having the spring finger there and its chief advantage. Now what your Honor noticed this morning in the Blake transmitter in that respect is exactly what you find in Drawbaugh's instrument H, and what is in the Blake, but passed unnoticed, is not in Drawbaugh's H. He has got the diaphragm supported in the cast-iron ring; and he has this long steel spring finger pressing against it; but he has his diaphragm *rigidly attached to the cast iron by this brass wire and these screws.* He has got the finger there, but it is not doing the chief work for which Mr. Blake invented it.

If Drawbaugh *saw* a Blake transmitter, and went home and tried to copy it, he would have put into it exactly what he has got in H, and he would have left out exactly what he has left out of **H**. He has put in what he could see, and he has left out that which was covered up. In our testimony, Professor Cross described the Blake transmitter. Mr. Benjamin, the defendants' expert, points out (defts, ii, 1262, at the bottom of page, and at the top of page 1263) that Mr. Cross's description of the Blake transmitter is correct, and says, "*Take the word 'weighted' out of that quotation*, and it correctly describes the carbon-holding arrangement in Drawbaugh's instrument **H**"; and then he points out that Drawbaugh's instrument **H** and the Blake transmitter are identical even to the form and details of structure. Can anything be more significant than this?

The defendants allege that this instrument **H** was completed in August or September, 1876, and that **L** and **M** and **G** and **O** were made a few months before it.

These microphones **L**, **M**, **G**, **O**, **H**, and the alleged subsequent instruments, are considered in the brief, pp. 182–190.

So that their allegation is that, during the summer of 1876, at the time of the Centennial Exhibition, Drawbaugh had these instruments. He says that he has made since then three instruments, with some modifications which are not material for me to examine, because they introduce no new principle, merely some variations of detail. I refer to **J**, which consists merely of two such contrivances as **H**, still without the weight, mounted on one diaphragm; **N**, which is virtually a cross between **L** and **D**; **P**, which is merely two instruments nailed to one back board; and **K**, substantially copied from Edison, but never finished, because Drawbaugh could not make it work.

As I read Drawbaugh's testimony, he does not claim that any instrument which he made after **H** (whenever that was) was even quite as good, or certainly not materially better, than this Blake transmitter **H**. He reached the high-water mark in the summer or early fall of 1876, if his story be true. If his story be true, he had in this instrument then existing substantially all that the world now has, *except that weight back of the carbon contact and the free diaphragm;* all the improvements the four years of invention since then have put into the commercial instrument he had got in that summer, and that was the summer when Mr. Bell became famous by his exhibition of thing break, and it ceases to talk intelligibly. In the Blake transmitter you see that the delicate spring which carries the back electrode is one which ends in a brass cup about half an inch in diameter, carrying on its face towards the diaphragm the black piece, which is polished gas carbon; it is weighted; it has lead or something inside of it and weighs about seventy-five grains. In Drawbaugh's instrument **H**, the back carbon d^3 is also carried in a brass cup d^2, carried on the end of a similar long and rather delicate spring D^2, *but the weight is left out*. All that one can *see* in looking at that part of the Blake, even to the manner and material for holding the carbon, is in Drawbaugh's instrument, *but the weight, which is the soul of the whole, is left out*. You cannot see that; you see the outside of the brass cup, and you do not know, unless you have studied the instrument and really understand such things, that it is weighted.

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The COURT. Before his first patent?

Mr. STORROW. Before his second patent, not before his first.

Now I want to make some observations on these instruments. If these instruments could speak and tell us their date, if their dates were burned into them by nature so that they could not be falsified, how this case would be simplified!

To prove the dates of these instruments, the defendants depend upon recollections and nothing else; the dates rest upon men who say that they recollect that at a certain time they saw these instruments or listened at some of these instruments. There is not a piece of paper which connects Drawbaugh's name with the telephone before 1878; and by and by your Honor will read those papers of 1878. Everything on the part of the defendants depends upon recollection. I do not mean to say that there is not some attempt to create an appearance of something better. A man says that he recollects that he saw a particular instrument while he lived in a particular house, or when he raised potatoes in a particular field, or when he made cider. He has got the deed to show when he bought the farm where he raised the potatoes.

But these are mere efforts of memory, — memory in some form or other is the link and chain on which they have to rest their claims.

But these machines, although they cannot tell us their date, do tell us something else which will help us. Look at these two instruments **L** and **M**; look at that microphone **G**. This man was a very nice, skilful mechanic. No man can doubt it. He not only was a good workman, but a fastidious workman. That instrument **G** was not made for sale; it was not offered for sale; but was made for his own private gratification. It is not only a well-made instrument, but tastefully made and fastidiously made.

Look at this, the broken glass tumbler **F**. Some of the defendants' witnesses say that the instrument was made of a broken tumbler, and some that the tumbler was broken soon afterwards. It is impossible to believe that a man who could make that instrument, the finished one **G**, would be contented with such an instrument as that, the broken glass tumbler **F**, as the representative of his speaking telephone, without making something better, when he got any results. It is at most but one or two days' labor to make this more perfect instrument.

And now, in the first place, they say that throughout this whole time, from 1864 or 1865 down to the time when this controversy began, he believed (that is the allegation) and told his neighbors — his neighbors come and say so — that the speaking telephone was the greatest invention he had ever made, that there was a fortune in it. Undoubtedly neither he nor anybody recognized all the value of it as it has since come out. But they say that *he* recognized it and told others that *he* recognized it, and his neighbors, called by him, say that *they* thought if he could complete it, that there would be a fortune in it, and that it would be the greatest invention of the time, and would supersede the telegraph and everything of that kind. The quotations from their record to this effect are collected in our brief, pp. 79–86.

I hold it to be perfectly certain that a workman with the skill that could produce that one (**G**), would not have kept this pair, — the broken tumbler **F** and the tin can **B**, — as the only pair for a week, *if he ever got results which he fancied would entitle him to call it a speaking telephone.*

Now, the story is that these instruments talked so well in 1867, 1868 and 1869 or thereabouts, that they transmitted whole sentences and newspaper advertisements.

Well, if that be true, they might be kept as precious relics of the past; but they would at once have been banished from the scene of action by better structures; yet the defendants have brought witnesses who swear to the actual use of that pair of instruments — the broken tumbler and tin can — for nearly nine years, until after the date of the Bell patent; that is, they have got witnesses in their record who swear that these were used in 1874, 1875 and 1876. That is a pretty hard thing to believe of any one, still more of such a workman, — a professed maker of electrical apparatus.

Well, we go back a little further in the deposition of Mr. Drawbaugh, and see what he has got to say about it. His story is that this pair of instruments, **C** and **I**, or the originals of which these are the remains, were made after **F** and **B**, and were much better than **F** and **B**, gave better results, better speech, every way better. Brief, pp. 150, 152 *et seq.*

Can you account for it, that after he got that pair (**C**, **I**), which gave much better results than these, that he should have gone on using these (**F** and , the tumbler and tin can) to gratify the curiosity of strangers — mere farmers and farm laborers and loafers, who came in there from habit or curiosity — when he had better?

Not only that, but these instruments **C** and **I** they allege were instruments which from their construction required no battery, required no troublesome adjustment; arranged once, they never required change; but these, **F** and **B**, if made as alleged required the most difficult and careful readjustment almost from moment to moment, from word to word, if they could talk at all.

Now, is it not incomprehensible (with that allegation in their record about the relative merits of these instruments, which is their story) that he should have gone on using these, **F** and **B**, for years and years and years, showing them to chance outsiders, and that he never showed those more perfect ones once. I won't say that he never showed them once; there are two witnesses, possibly three, in this record, out of three hundred and sixty-six witnesses, who say that they saw those improved instruments **C** and **I**. There are only two who pretend to have used them down to 1876, — two witnesses, possibly three, — and yet they swear to continued use of **F** and **B** all that time.

That is not all. Suppose that he had in the tumbler **F** a variable-resistance battery transmitter. He then makes **C** and **I** and **D** and **E**, two sets of apparatus, in each of which the transmitter is a magneto transmitter. It is thinkable that he might still wish to experiment with a battery transmitter. Their story is, that **F** was made in 1867; some of their own witnesses swear that it was in daily use in 1876, and in every year between. Even if he wanted to experiment with a battery transmitter, it is not within the limits of possibility that so good a workman would have continued to use **F** as his sole battery transmitter for nine years. Yet the story is, and the defendants' depositions (if you believe them) are, that he had no other for nine years, and then suddenly jumped to the refined instrument G.

Nor is this all. If you can conceive that he should continue to use the tumbler F, still that requires a receiver to be connected with it. They say that the tin can B with a bladder was made to go with it in 1867. In 1869 and 1870, he made, so they say, the magneto instruments C and I, each with metal diaphragms. Each of them was a receiver; each was a receiver better than B, he says. He says that I was the best receiver he made until he made D and E, alleged to have been in 1875. He says that he used C as a receiver connected with F as a transmitter, and that he used I as a receiver connected with F as a transmitter, and that each of these gave better — far better — results than the tin can B did when used with the same transmitter F. Now if he were experimenting with F, or if he were exhibiting to idle visitors what could be done, and wanted to use F, he would certainly use his best receiver. Yet their own witnesses swear that he used the tin can B in 1876, after the date of the Bell patent, and not a single witness for the defence (except the claimant Drawbaugh) pretends even to have witnessed any use of I with F.

But the proof does not stop here. Drawbaugh swears in his deposition that, in point of fact, after he got the alleged later and better ones, C and I and A and D and E, he did not use the tin-can and bladder instrument B. He says that not long after he made C, — a year or two perhaps, — that one, B, the tin can, went to the garret, and the mice ate off the membrane, — the diaphragm, — and he never put on another. The shop was an old clover mill, and was overrun with mice; and that is what became of the membrane. (Brief, p. 154.)

I am going a little further into this matter. Here are instruments A, D and E, a great deal nicer than F or B or C or I. Not perfect instruments, but good enough for commercial and practical uses. Is it thinkable that when he used a telephone merely to gratify the curiosity of farmers, or when exhibiting one under circumstances that required him to produce his best, as, for example, when he had a man there whom he says he wished to induce to invest money in this invention, that he would not have produced his best instrument? Is it conceivable that having much better instruments, he should still use these, tumbler **F** and tin can **B**, or either, when it was desirable to make the best impression, and show the best that his instrument could do? Not only is it not conceivable, but it disproves itself.

Indeed, he swears that when he made his next pair, after **F** and **B**, or not a long time after that, **F** also, as well as **B**, went to the garret, and was destroyed by the mice. (Brief, pp. 154-5.)

Now when we find that at a certain period his own witnesses say that he was using the tumbler and tin can for examples, we *know* that there was then no better one in existence; we know that this particular receiver, the tin can **B**, used at any particular time, displaces these better ones, disproves their existence at that time, puts them out of the field as certainly as one body displaces another in space.

These considerations, and the evidence bearing upon them, are set forth in the brief, pp. 151–158.

It is true of and **B**, and also of **C** and **I**, not only that they are plainly mere experimental instruments, but their extreme rudeness is such as to show that they never yielded results enough to warrant a couple of days' work in making better ones. The story is that they were all he had for seven or eight years. It is certain that at any time when he was using them, he had not got results enough to warrant him in spending a day in making better ones. This is the more certain because he was a very neat and fastidious workman, as witness the instruments confessedly made after the Bell patent. Seven or eight years of continued use of those rude contrivances would have been impossible. Results which would have tempted him to much experiment if he was really an inventor, would have made him at once construct better instruments. (See brief, pp. 147–150).

The answer says that "during the years 1870, 1871, 1872, 1873, 1874," and prior and subsequent thereto, — particularly and specifically mentioning those years, and none others, — he had instruments which successfully and practically transmitted speech, and that they "are still in existence and capable of successful practical use" (p. 42, *supra*).

There they are, — **F**, **B**, **C**, **I**, **A**, — all which are alleged to have been made during these years. With the exception of the receiver **A**, which is only half an apparatus, and incapable of use by itself, they are wrecks, incapable of transmitting a sound, all the operative parts gone. No sound can now be transmitted by means of instruments alleged to have been made during the years named.

Here is an answer under oath, made when they had had these exhibits six months, — the record so shows (defts, i, 558; ii, 1073–4). There is in it no more persuasive nor important allegation than this, that instruments which existed before our invention and in the years named are still in condition to speak for themselves. That is all that lifts this above the level of a scrap-heap defence. The assertion is false. They knew it to be so when they swore to it.

Let me be perfectly accurate about this. Two instruments, **D** and **E**, are in working order or nearly so; but they are alleged to have been made in 1875, and though doubtless these are provable under the pleadings, yet the specific allegation about the years specifically mentioned is false.

May it please your Honor, it is not only that the answer insists upon that group of instruments as made before the close of 1874, but that date is itself plainly material. If we are right in our views of the facts and the law relating to Mr. Bell's invention, the date which the law gives him is in the fall of 1874. These gentlemen knew that when they filed their answer. With our moving papers we filed Mr. Bell's affidavit which stated the facts, and in their answer they not only say that Drawbaugh had made this invention in a successful practical instrument before Mr. Bell's patent, but in terms *before his invention*. If the allegations about the years specifically named are true, Drawbuagh was before the date we alleged for Mr. Bell, but not otherwise. That allegation was not a mere accident. It was the most material allegation in the case. How could they swear to that allegation when they had the instruments which they now produce? I cannot understand it.

We have in the record three hundred and sixty-six witnesses for the defence; all to prove that Drawbaugh made a talking telephone before Mr. Bell. If they do not come up to that, that the thing talked, and practically talked, they amount to nothing, except so far as they tend to prove that they go for nothing.

Now, if those witnesses prove anything, they prove this, that the first crude apparatus, the tumbler and tin can F and B, and every other set alleged to have been made before the close of 1874, were perfectly good, successful and practical telephones. Between four fifths and nine tenths of their witnesses are as to that group of instruments alleged to have been made before the close of 1874. That is not all. Half their witnesses are as to that first couple F and B, the tumbler and tin can. That is not all. Fully two thirds of their witnesses, if they prove anything, prove that an apparatus made up of that tumbler as a transmitter, and either the tin can or the flat instrument A — the farthest one — as a receiver, were perfectly good, successful, practical talking telephones. If you are going to believe their record, nine tenths of it, or three quarters of it at least, (not three quarters of four witnesses, but three quarters of three hundred and sixty-six), prove that these instruments, F, B, C, I, A, all that are alleged to have been made before the close of 1874, make perfectly good talking sets. The pair of little magnetos, D and E, those with the curled magnets, will talk; they are good enough to break any patent, if early enough. Well, may it please your Honor, they have got eight men out of three hundred and sixty-six witnesses to swear that they listened at D or E before the date of the Bell patent. Only eight, *and Mr. Drawbaugh is not one of them.* When you come to see those eight, you will know that they had better have left out half of them, who are bad enough to spoil any case. So plainly the defendants' proofs go to the same instruments as the specific allegations of the answer. Are they equally false?

Would your Honor like to know whether those instruments ever did or could talk? Would your Honor like to have been there when they were in working condition, if they ever were, and tried them? Would that help you in trying whether you should believe half or three quarters of this raft of witnesses? These instruments were produced. They have had man after man, farmer after farmer, with all the intelligence that belongs to the Dutch farmers of the interior of Pennsylvania, to come and swear to your Honor how well they talked; and when they got through with that, they finally thought it would be a good plan to find out whether they actually ever could talk or not; so they had Drawbaugh, their man, make what they called reproductions. The working parts, the most important of them, are all gone. Not a witness to all these instruments can tell what the insides were. They have the intelligence which belongs to their class, — they can tell a bootjack, perhaps a corkscrew. As to telling the mode of operation, or even the structure of those instruments, they do not know it. All they can say is that they went there at such a time and they listened and they heard speech. If those instruments are to be reproduced, Drawbaugh, the claimant, the party interested, has got to do it out of his own head, — nobody else, — restrained or assisted, as the case may be, by what remains of them.

I am going to read a passage to your Honor from the opinion of Judge Sprague, in the Howe sewing-machine case. That was a case like this. Witness after witness came and said they saw the machine. The remains of it were produced — brought into court. The witnesses said the machine sewed capitally — better than Howe's machine sewed. They always say that in these cases. All the witnesses remembered that it was better than anything now in existence. They produced the remains, and the man made what he called a reproduction and brought it into court, and it sewed, — they took a piece of cloth and made a seam, — carried the thread through, back and forth, not very well, but it sewed. They said, that is proof that the old machine was a sewing machine. I will read now from p. 146 of our brief: —

> "We come then to another part of the evidence, — *these old remains.* These are very important, undoubtedly; for, when a new invention is sought to be intercepted by a former one, the production of a former machine is, I will not say essential, but of a very great importance, showing that it does not rest merely in the recollection of witnesses that there was such a thing. These are the remains of a machine claimed to be invented by Mr. Hunt as a sewing machine, which was in the hands of Adoniram Hunt, and transferred to Arrowsmith, kept by him, and found by him, as he states, in 1851, in the rubbish of his workshop. They exhibit some of the instrumentalities, but certainly to the eyes of those who are not experts, but few of the means, of forming a sewing machine; and to the eyes of the experts they present the same deficiency. One, at least, of the defendants' experts, when he was called upon on a former occasion, looked at them, and then testified that there was nothing there from which a sewing machine could be constructed. He says now that he has changed his mind, upon a more careful ex-

amination. At first view, then, they would present no satisfactory evidence of having been a sewing machine.

"The reasoning of Cuvier, by which, from seeing a few bones, he could reconstruct the whole animal, proceeded upon the assumption that the animal was a perfect work made by a Creator perfect in His operations; and if the animal were a perfect work, then he could see from its remains what must have been necessary to make that perfect work. But that would be assuming the point in controversy here.

"The experts say that several parts of the old machine are the same as those parts in the new. Undoubtedly, as far as those parts go, they are the same as in the new machine. But how is it with those parts that are *not* in the old machine? These experts cannot say, reasoning by analogy, except upon the assumption that it was a perfect sewing machine." (Howe *v.* Underwood, 1 Fisher, 175.)

We have got in this case what the defendants allege to be the reproduction of what they say *these* were. The story which these tell, in the language of Judge Sprague in another part of this case, is, all that they necessarily prove is, that they are "imperfect remains of an imperfect machine." To prove that they are remains of a perfect machine is going something beyond what the remains themselves can prove. These defendants, or Drawbaugh, are to make what he calls a reproduction. He has had ten or fifteen years of experience since the time when he says he made the originals. I am going to show your Honor by and by that the so-called reproductions are far better than the alleged originals which the witnesses testified about ever could have been; by which I mean that they have in them, not only parts which are not now in the originals, and which may or may not have been there, which may have been of one character or another; but that the alleged reproductions contain parts and instrumentalities, in their most important features, for the transmission of speech, which parts not only are not found in the remains, but are inconsistent with the parts that are in the remains. But before I do that, let us see what use we are to make of the so-called reproductions. The defendants made them, and having made them, they called their patent solicitors and expert, Mr. Benjamin, to try them; and they put him upon the stand and had him testify that they were good, practical, operative, full-sized speaking telephones. Strong language. When we came to cross-examine him, we simply asked him to do it again. We said to the defendants, "Take your own time, your own place, your own conditions, your own operators. Let one of your men talk into the transmitter, and let the other listen. Do it your own way. We do not want to be open to a suspicion of doing it with a half-heart. Do it yourselves. But we will have a reporter to write down what is said by one of your men in the transmitter, and another reporter to report what your man at the receiver says he heard." We did that.

We spent three days at it. We printed those reports and put them in evidence in parallel columns. That is a trial by the Court: more than by the Court. It is a trial by the defendants, in the presence of the Court. More than that, it is a trial by the defendants of better instruments, as I shall show you, than they ever had. Now what is the result? I shall show you that they were under better conditions, were tried by better men, than ever they had the advantage of at Drawbaugh's shop. This was no longer a speech by one unskilled farmer to another unskilled farmer; but it was an attempt to use his apparatus by skilled experts. Now what is the result?

Let me, before I begin to state what was done, — that you may see that I am not exaggerating, — let me read just what they say they got out of the instruments in bygone years. I will take the quotation at page 160 of the brief. This is a question they put to Drawbaugh: they asked him what he got out of the first set, the tumbler and tin can. Every succeeding set was better than the former, he said. Not only that, but every succeeding receiver coupled with the tumbler **F** made a better couple than the tumbler and tin can **B**. The first was the tumbler and tin can, **F** and **B**. Now they ask what these were (defts, ii, 810): —

> "*Q.* 178. During that time, and before you made instrument **C**" [which is alleged to have been about 1868 or 1869] "what results had you been able to get with the instruments **B** and **F**?" [**B** is the tin can and **F** is the tumbler.]
>
> "*A.* Sufficiently good to be heard distinctly; there were even words that were whispered; you couldn't just hear the words exactly, but you could hear the whispering; I did that often; spoken words you could hear — the whole sentences — I mean words spoken out loud and not whispering merely. I would have persons in the cellar reading printed matter, — some advertisement

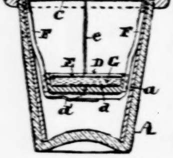
r something, — and I could hear the words that were read; and at other times I would go down into the cellar and read something, and, coming up, they would repeat the words to me that I had read."

That business was carried on in the machine shop with an unskilled farmer at one end; and, with these instruments, that couple, before 1870, they say that they got whole sentences and newspaper paragraphs. If you can do that, that is a speaking instrument. There is no doubt at all about that. Not that once in a while only they got it, and most of the time did not; but they got it constantly right along. Such an apparatus would be good enough for use. There is no dispute that it was good enough to use, good enough to anticipate, if this be true.

Drawbaugh himself testifies that at that time he thought his instruments, the tumbler and tin can, had reached such a point that they were good enough to patent (defts, ii, 926–7, 1096). There is no doubt about that, if they can do what he says of them. Now, can they?

We met in New York in a building in Fourteenth Street. By and by I am going to describe the instruments more particularly. We met there to try the alleged reproductions. Here is the alleged reproduction [*indicating the instrument*]. There is a picture of that "reproduction" of **F** on one of the cards, there is a picture of the "reproduced **B**." We met at rooms on Fourteenth Street, which the defendants had provided.

Perhaps I may as well here explain how "**F** reproduced," which your Honor has in your hands, operates.



The current from a battery comes down one of the side rods F, then half way across the bottom of the stirrup to d', then through the metal rivet d' to a metal plate d which lines the bottom of the wooden cup D inside. This cup is filled with a powder G, which will conduct electricity, though not very well. On top of this powder rests a metal plate E; this by the stiff metal strut e is fastened to the metal diaphragm C. To this diaphragm is soldered the silk-covered wire H, which leads to the receiver and through it to the battery. The current, therefore, flows from the battery down the rod F, the rivet *d′*, the lower inside plate *d*, the powder G, the upper plate E, the metal strut *e*, the diaphragm C, and the wire H, through the receiver and back to the other pole of the battery. If the cup D were of metal, this would not work, because the electricity would flow through it; it is of wood, which will not conduct electricity; so the current, to get from the lower metal plate *d* to the upper metal plate E, *must* flow through the powder with which the cup is filled.

Mr. DICKERSON. Inside of the wooden box. The wooden box is put in to be a non-conductor. In the bottom of that wooden box inside is a rivet, riveted through the wood, a metallic rivet, so that the current can get through the wood and pass into the lower plate, then through the powder and out by the top plate that lies on the top of the box.

The electricity, your Honor, goes down that wire F, goes up through that rivet *d′*, and strikes the bottom plate *d*. Now, in order to get out, it must flow through the powder G that lies in the cup. Then you see it runs up this wire here *e* and goes off on to the line H. That powder in here, if it is pressed more or less, varies the intensity of current.

Mr. HILL. Varies the resistance, you mean.

Mr. DICKERSON. Yes; and therefore varies the current.

The COURT. How does it get through the powder?

Mr. DICKERSON. The powder is a conductor, but a bad one. In order to make it go through that powder, that thing you see, that box, must be wood or some non-conductor, because if it were a good conductor like metal, the current would flow through the sides of the box and not through the powder. That is the reproduced instrument; here is the original instrument, which has no such apparatus as that about it. That is the original one; this is the reproduced instrument. This reproduced instrument is the one we are explaining, and the one that was tried in New York.

The COURT. How did the current get through there in the old one?

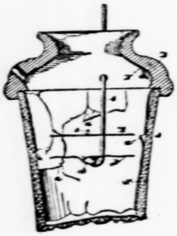
Mr. DICKERSON. It is said that there was a wooden box around this, and that it was riveted by a rivet through the bottom of it. This went through the bottom, and the wire is soldered fast to the bottom plate there. Here is the bottom of the plate in the old one; and here is the thing that did all the talking in the "reproduction."

The COURT. Of course there must have been a box around this apparatus to hold the material, whatever it was.

MR. DICKERSON. Yes, sir; there must have been a box around that, if it was such an instrument as they want us to believe it was. Now, that is the thing that hung by that loose wire in this one. In that instrument ("F reproduced"), your Honor sees, you pick up the top and then you have picked up the whole apparatus. The tumbler is a mere case to enclose the whole. You might hold it in your hand perhaps, just as well; it could be done. The relative parts are united to one base, as it were; that is, to the cap piece of wood. That is the diaphragm, varying the pressure to be put upon the powder by reason of the circumstance that this cup of powder is held up by these two suspenders against that top; and the diaphragm is held by its edges in the same top, while the centre of it to which the upper plate is attached, vibrates up and down. They say that in the old instrument F there was a bladder across here on the top of the tumbler for a diaphragm, and by some means or other this wire was run through the bladder. (See brief, pp. 170-4)

The COURT. The bladder was tied over the top of the tumbler for a diaphragm.

MR. DICKERSON. Yes, sir.



Original F.

Then the remains of the original show that the wire C, to which this lower plate is soldered, hung in that loose hole in the cover like that. In order to make "F reproduced" work, it is necessary to have the distance between the two plates exactly right; an infinitesimal distance out of place will spoil it. With such a thing as F,—that single wire,—you could not touch it even to try to adjust it without knocking everything out of place. That is one difference between the two.

In this F nothing can be got through. In that "F reproduced" there could. In the so-called reproduction, in order to keep the relative distance apart of these two plates, that cup and the plates are suspended, and both are fastened to that top — the wooden top.

Now, in the old one there is a single wire on one side. You could not touch that wire without throwing it all out of position. This membrane diaphragm instrument has never been tried.

The COURT. This is the reproduced instrument.

Mr. DICKERSON. Yes, sir; that is the reproduced instrument. They never tried a reproduction of the membrane-diaphragm instrument.

Mr. HILL. He had it in both forms, but he reproduced this form of instrument to show what was in both.

Mr. DICKERSON. There was no original produced of that one with the double rods. It was made for the purpose of being tested in this case. There was no attempt to make a test of this original F, or one like that.

The COURT. How about the tin-can instrument?

Mr. DICKERSON. The new tin can. This is an electro-magnet. This has two cores, around which are spools to hold the wire. That is called an electro-magnet — a coil of wire around a core. Here is a pair of binding posts. Those binding posts are not in this original.

Mr. HILL. Those are for binding posts.

Mr. DICKERSON. Here is a pair of binding posts, by means of which the wire going around the magnet can be kept fixed — to these binding posts. There are none on this original instrument.

Then here is a diaphragm of bladder. It has a metallic strip fastened there, which is the armature. That is riveted or glued fast to the bladder.

Now, when the varying current passes through the electro-magnet it varies its magnetic strength and makes it attract that armature more or less, and causes this diaphragm fastened to the armature to vibrate in unison with the variations of the current. Then the listener puts his ear to the open end of that can and hears.

Your Honor will see that on this old thing the listener could get his ear out here somewhere [*indicating a certain length of wood not appearing in the reproduced instrument*]. In that reproduced instrument, when first produced, the wooden board was of the same length as this old one; but when Benjamin, the expert, tried to use it, he sawed it off close to the open end of the tin can, so that he could get his ear to it (defts, ii, 1307).

That is the armature on the diaphragm; here is the electro-magnet. Then it was supposed that there was fastened to that diaphragm this armature; that is, fastened here to this. Then when they vibrated under variations of pressure, the listener was out here and heard it, having his ear placed here.

Mr. STORROW. The operation of the so-called "F reproduced" is this. When the mouthpiece is spoken to, the diaphragm vibrates. When it vibrates downward, the upper plate fastened to it presses down on the powder and makes it a little more compact. In that condition it becomes a better conductor; the current passes more freely and becomes stronger. When the diaphragm and attached plate move upward in vibrating, the opposite effect is supposed to be produced, and the current becomes feebler. Thus the vibrations of the diaphragm change the strength of the current furnished by the battery, by changing the electrical resistance offered by the powder inside this cup. That is what it was hoped the instrument would do.

The so-called reproductions were made at Drawbaugh's shop, by him and his brother, under his direction, for the purpose of being put in evidence in this suit (defts, ii, p. 905, ans. 650; p. 1036, x-ans. 1296; p. 1040, x-ans. 1326; p. 1074, x-ans. 1510). The defendants' expert, Mr. Benjamin, tried them Nov. 29 and 30, and Dec. 1 and 14, 1881 (defts, ii, 1294). They were put in evidence and sworn to by Drawbaugh as reproductions after that, to wit, Jan. 11, 1882 (defts, ii, pp. 904–5).

Mr. Benjamin had actually tested them — so he says — by transmitting sounds (whatever sound it was) through them before they were offered in evidence. They were not instruments that we asked them to make; they made them of their own accord. It was not we who first asked to have them tested. They made them — Drawbaugh made them — and he and their expert tried them, before they put them in evidence. When they put them in evidence and swore to them as correct reproductions, with more or less modifications, each of which was confessedly an improvement, we have got to take it that they were at least as good as those he remembered years back. Then they put Mr. Benjamin on the witness stand and they had him describe the trials of all those instruments that were made (defts, ii, 1224–1248), and then they put this question (defts, ii, 1256): —

> "*Q.* 54. Please refer to the various instruments made by Mr. Drawbaugh, and state whether you find any, and if so, which ones, to be good, full-sized, practical working, speaking electrical telephone instruments.
>
> "*Ans.* All of Mr. Drawbaugh's instruments that I have tested I know to be good, full-sized, practical working, speaking electrical telephone instruments; and with regard to his instruments and forms of instruments to which I have referred in my previous testimony, but have not tested, I consider that these, by reason of their form and construction, may fairly be included in that description."

Certainly, it was painting the lily a little, after they had got one hundred and twenty-five witnesses to swear that they talked, to call one more; and yet no one can deny that if the thing to-day would not do it, it does not make any difference how many witnesses they had. And they recognized that in their answer, when they swore that the old instruments were *to-day* practical, successful, working instruments. Not a word of that was true.

They had Drawbaugh make reproductions, and they got a man to swear that they were practical, working instruments. Then when we came to cross-examine him, we simply said, "Repeat the test that you have been swearing to." (Defts, ii, 1296.) He did it. I am going to read the result. These tests continued three days. They were not all tests of these two instruments. We tried most of those on the table. We tried the large instrument **H**, the Blake transmitter. I should add that it was agreed that Drawbaugh might repair all the instruments, so far as was needed to put them in the same condition as when Mr. Benjamin tried them, and this was done. (Defts, ii, 1300.)

I am going to read a little from the deposition of Mr. Pope, or rather state a little of it. The reports at each end were taken in long-hand and in short-hand. There were writers and reporters for both parties at each end, and the reports were all printed, and make a considerable portion of our volume IV. Mr. Pope collated them, and put them together in parallel columns and summed them up, and where there was any fair ground for question, he followed the defendants' notes. But there was no difference of consequence in these notes.

We met March 28, 1882, in the morning and began, and the first instrument we were to try was the "reproduced **F**." Mr. Benjamin in his deposition calls it "**F**"; your Honor will remember that what he refers to is the "reproduced" instrument. We had several experts on our side, and Mr. Benjamin and their experts on their side. They connected these instruments, and were proposing to ourselves to hear, as Drawbaugh said, whole sentences and newspaper paragraphs or advertisements, or something of that kind read so that even the common farmers could understand them through this "full-sized, practical working, electrical speaking telephone"; and when we met — we were about ready to begin — Mr. Benjamin said all he expected to get out of those first instruments ("**F** reproduced" and "**B** reproduced") was "*a sound and now and then a word.*" (Complts, iv, exhibits, p. 584; ii, p. 1323.) Prophetic speech! It was all he did get.

The instruments had already been rigged up and tested on lines which were run from the rear of the building in Fourteenth Street to the front room.

In the rear room were the transmitters as they were used from time to time during the experiments. In the front room was the receiver and the person listening. And yet I should not say in the front room, because the lines for the receiver were carried into a closet in the interior of the building, and the listener, generally Mr. Benjamin, the defendants' expert, retired into that closet and shut the door; and the window of the adjoining room was shut and nobody was allowed to move or whisper. Under those circumstances, very different from the noise of the machine shop, a trained listener practised with this particular instrument, a man of acute intelligence and trained faculties, instead of a country farmer, was listening with his utmost capacity to what he could hear, because the salvation of his case depended on it.

What did he get? In the first place, we arranged, — rather they arranged and adjusted "**F** reproduced" — I shall speak as to this adjustment by and by — by putting on a modern instrument for a receiver. Drawbaugh and the farmers did not have that advantage. After that was done, they put on the listening end the "reproduced" tin can as receiver, with the "reproduced" tumbler as transmitter. I will ask your Honor to turn to Mr. Pope's deposition, complts, ii, 1323.

The first thing the listener heard was that some one was counting from one to twenty: he recognized that. The next he heard was, "*I am now talking into transmitter.*" We found after a while that that was an old and familiar phrase. The next thing that was heard was a sentence spoken, the whole of which was, "I am speaking into the tumbler instrument with a galvanometer in circuit," of which the listener heard only the words "*galvanometer in circuit.*"

The next thing he heard was, "*Do you understand?*" Next, several sentences were spoken, out of which only three detached words were heard. Then they heard the word "*answering*" and the words "*what I say.*" Then several newspaper sentences were read, but none understood; that is all that was accomplished in half an hour.

Then we tried another test (compl'ts, iv, exhibits, 487). I have here in parallel columns what was said into the instrument at the transmitting end, and what Mr. Benjamin, listening at the receiver in his closet, thought he heard, the instruments being "F reproduced" and "B reproduced." The first thing that Mr. Benjamin said he heard was, "*I am speaking now into the old tumbler instrument; do you hear me?*" That was spoken.

Next, a sentence was read. Not understood.

Next, a sentence was read. No articulation.

Next, a sentence of 31 words is read, and only 3 of them heard, and those 3 are detached words.

Next, a sentence of 18 words is read, and 2 words were believed to be heard and those were not spoken.

Next, 13 words were read, but no words understood.

Next, a sentence of 24 words was read, of which only the word "*and*" was heard, and nothing more.

Next, a sentence of 24 words was read, and 2 words that were not spoken at all were believed to be heard.

Then a sentence of 16 words was read, but nothing was heard.

Then a sentence of 22 words was spoken, but Mr. Benjamin said that passing horse cars drowned the voice and he got nothing.

Then a sentence of 20 words, and he didn't get it at all.

Then 107 irregular numbers were uttered into the transmitter; Mr. Benjamin said he heard 63 of them, but when they came to compare notes, 16 of them were right and the others were all wrong. How is that for an instrument for practical purposes as a means of transmitting intelligence? If he had heard 16 numbers out of 107, and heard correctly all he did hear, it would not have been so bad.

Then they went on and read a sentence of 23 words, of which nothing was heard.

Then one of 27 words; none understood.

Then one of 36 words; none understood.

Then the same sentence was repeated, but could not be understood.

Then a sentence of 29 words, of which nothing was heard.

Then 22 words; nothing understood.

Then the sentence, "How is that for high?" was heard, whereas the sentence spoken was, "I see five cats."

Then followed four or five phrases not heard, and then there came again the everlasting "*I am speaking into the tumbler transmitter.*"

Then three sentences with 30 words; nothing heard.

Then came eleven phrases of 70 words; not a word of them understood.

Then 11 numbers, of which 4 were heard; 2 of these were right and 2 wrong.

Then 28 words; 2 words were believed to be heard, but they were not spoken.

Then 28 words again, and 2 words of that — "*New England*" — were heard.

Then another, "Did you hear the music? the music box is not now playing"; they heard the words "*music box.*"

Then, "A disconnected LeClanche battery stands on the table"; the word "*battery*" alone is heard.

Then, "Let's adjourn for lunch"; they did not hear that.

Then, "Everybody seconds the motion to adjourn for lunch"; it was now half past two, and they heard the words "*adjourn for lunch.*"

The tests were continued three days.

The case continued two years after that; they called two hundred and twenty-eight witnesses after that, but *they never repeated the test, even with those two "redroductions."* That is their test with better instruments, under better conditions: *their* test, full and fair. We spent three days there; we spent nearly a year afterwards in Harrisburg taking testimony. If they thought they could do better in Drawbaugh's shop, with Drawbaugh's farmers as operators, we should have been only too happy to have tried further experiments. They never tried it again. Nearly two years more testimony, but no more tests.

Now, farmers testifying from memory, Drawbaugh testifying from memory, and everything else of that character, — does all that go to make you believe that the originals, if they existed, of which these things are improvements and "reproductions," were practical speaking telephones, or speaking telephones that could even speak anything?

We will go on to the next set of instruments. The next set of instruments we find in these tests were the tumbler ("**F** reproduced"), and this marked "**A**," — the flat one. That, according to his story, as near as you can make out, is about as good a couple of instruments as he had until you get to **D** and **E**. His assertion is that he had no better couple before the end of 1874. This couple was said to be better than those, **F** and **B**, through which he asserts that whole sentences and advertisements were heard. We tried this couple; not **F** and **A**, but "**F** reproduced" and **A**. I will read from complainants' proofs, Vol. II. p. 1325, Mr. Pope's deposition. I may as well say here, that though they called over two hundred witnesses in surrebuttal, they called no witness to say a word in contradiction of this report and testimony of Mr. Pope. This is what Mr. Benjamin, listening at the receiver, says, after the utterance of each phrase or sentence into the transmitter, and I will print in italics all that was heard correctly. "Not heard"; "Not heard"; "What?" "What?" "Not heard"; "Not heard"; "Not heard"; "Not heard"; "Pretty faint"; "Great deal louder, but a peculiar twanging sound"; "Not heard"; "Nothing at all"; "Not a thing"; "Nothing at all"; "Quite good; can't you give us a sentence?" "*Answer back to me what I say*"; "Too faint": and so on for fifty minutes. This is a favorable specimen of results: I ask your Honor to read the rest. That was the best they got from that apparatus on that day.

The third day we tried again. We tried again tumbler "F reproduced" and A. Look at the precautions they took. The trouble with the instrument "F reproduced," if it operated as they say it should, was that the slightest disturbance threw it out of adjustment, so that you couldn't work it. A person walking across the room would disturb it; a strong sound applied to it would disturb it; a person putting his fingers on the table would disturb it. On the first and second days they had arranged it on a heavy office table; the last day they put up a heavy block of artificial stone on the heavy office table. They placed the transmitter on that. The operator leaned over it with the most scrupulous care and carefully modulated his voice; and got what? There were 137 phrases uttered into it on the second day; 7 of those were understood, and some words out of seven more, and that is all. The third day they had got better. They uttered 175 phrases into the transmitter, 35 of these were heard. On the last day when they had this block of stone and several days' practice, they (not Drawbaugh, but Mr. Hill and Mr. Benjamin) got through 35 short phrases out of 175 — familiar phrases for the most part. Now, your Honor knows that if an instrument, ten years before the Bell patent, had given that result, — and add to it the fact that the man who made that, being a first-rate workman with a machine shop at his command, a professional patentee and inventor, making his living that way, had never during ten years afterward put it to practical use, never went to the Patent Office with them, — why you would know how to account for his conduct.

If the instruments he had, had behaved as well as that, they would not anticipate this patent.

Then they went on with the so-called reproduction of C and the so-called "I reproduced"; the results were that out of forty or fifty sentences uttered into one end, the listener at the other end did not hear a single complete sentence. He heard detached fragments of several sentences. That is the best they could do with so-called reproductions of instruments C and I. For all these tests see brief, pp. 156 *et seq.*

This is what was done with instruments Drawbaugh made with the skill of 1882; how much could he do with the skill of ten years earlier?

Mr. Dickerson has called your attention to some features of the "reproductions" which made them better than originals could have been. Chief among these is the difference between what the "reproduced F" and the tumbler F must have been if F ever existed. The great trouble with that instrument "F reproduced" was that the pressure between the upper plate, which is fastened to the diaphragm, and the cup of powder had got to be exactly right. As Mr. Benjamin described it, the movement of the screw through "an infinitesimal fraction of an inch" would throw it out of adjustment. If it got so that the instrument "broke," as it is called, — parted contact between the carbon and the copper plate, — the consequence was that a loud sound was produced in the receiver, which could be heard several feet away. It was not only inarticulate in itself, but the loudness of the sound produced so stunned the ear that a person listening for sounds, so faint that he could not in a closet hear them, would have to wait for the next that came along.

See brief, p. 167 *et seq.* for the falsity of the so-called reproductions.

The original instrument F in the first place had a bladder diaphragm, as they say. The "reproduction" has got a metal one, which is a great deal stiffer, better, firmer, and more true. One of the advantages of the metal over the bladder is that it keeps its adjustment. Again, the upper plate, carried on a rod depending from the centre of the diaphragm in the upper plate, is firmly secured or soldered to the plate of metal. In the other, it has got to be fastened by a piece of bladder and perhaps a couple of washers, giving it very little stability.

The COURT. Mr. Dickerson has explained the difference between the two pretty fully.

Mr. STORROW. I did not know whether Mr. Dickerson explained it or not. Another difference was this: during the tests in New York, note the care with which this tumbler was placed on a heavy block of stone — an instrument of such delicacy that the slightest jar threw it out of adjustment. One can't but think that a nice workman falling on that difficulty — and if he ever had such an instrument he encountered this trouble every minute — with a tumbler with a broken bottom for nine years — would have tried to remedy it at least as far as to use a whole tumbler or make a better case. Think of a tumbler with a broken and uneven bottom resting on a bench in a machine shop as compared with the instrument and conditions in New York. Why! they could not have got a word through under such circumstances.

But that is not all. The value of these tests is not merely that they throw the instrument out of the case. Judge Sprague said in the Howe machine case that the fact that Hunt's machine would not work (when he had reached that conclusion), "made the oaths of the witnesses as inoperative as the machine." More than half of their testimony here, if it is to be believed at all, shows that the instruments **F** and **B** were practical speaking telephones. That is not true. Such witnesses are worthless.

Moreover, the very rudeness of instruments which, if constructed as alleged, required great delicacy, is fatal to the story. If Drawbaugh had got any results, or even used the thing half a dozen times, he would at once have made certain obvious changes.

There is some difference between having a whole tumbler and a broken tumbler, but there is no invention in it; nothing but workmanship. Is it possible that a man who got results which made him believe that that instrument was the greatest invention of his time, would have gone on using that? I think Mr. Dickerson pointed out to you how they used the tin can. As soon as Mr. Benjamin wanted to use it five minutes, he sawed this piece of wood off at the end. Would a man have gone on using that for nine years, getting a sound so faint that, in New York, Mr. Benjamin had to retire into a closet to hear it? What did Drawbaugh get? That he stuck to this for a week proves that if he got a sound, he got nothing which led him to hope that he could use it to convey words. Again the story is, they have witnesses to swear to it, Drawbaugh says, that a farmer down stairs would talk into **F**, read a newspaper paragraph, and he, two stories up stairs, would listen. They have got another witness who swears that one person who used their transmitter was Drawbaugh's boy, between five and six years old at the time, — he and the farmer. Why, that countryman and that boy did a thousand times more than these experts in New York could do with a better instrument. We simply *know* that is not true. Away with such witnesses!

In New York, we ran, as I told you what we called a tell-tale line between one station and the other. It was put up originally to enable the observers to know what was going on in the other room. But the particular advantage of that line in testing the instrument was this: The person listening at the tin can when "F reproduced" (the tumbler) was used as transmitter, would say, "It is too faint: it is too loud," or, "There is too much pressure," or, "There is not pressure enough"; or that he heard or did not hear; and the skilled man at the transmitter knowing every five words what was coming out would know whether he should speak a little louder or more gently, or whether he should screw it up a little more, or loosen it; whether he should bring his mouth a little nearer or farther off. These were advantages so inestimable that one can hardly measure them. Think of the condition of things. Mr. Drawbaugh at one end and a farmer at the other end. The listener runs down two flights of stairs. "Can't hear a word." "What is the matter?" "Shall I adjust it up or down?" "What is the trouble?" "Louder or lower?" The operator may guess, the farmer can tell him nothing. You might go a month there with that and not get even the few words that we got in New York.

The consequences of those tests knock out three quarters of the witnesses, so that you cannot believe what they say. It knocks them all out, — witnesses who have sworn to perfect speech through that tin can. It knocks out all who have sworn to speech with anything before D and E, that is, three fourths or more of their record.

These tests show that even if practical results had been attained in New York, they could not have been got with worse instruments by Drawbaugh's farmers at his shop.

D and E I am going to speak of by and by. They talked. It is a question chiefly of their date and their identity.

Now, I want to state to your Honor the history of this man's life.

It does not seem possible that a man who was a professional inventor, the virtual proprietor of a machine shop, not owning it, but having the free use of it, a maker of electrical apparatus especially, should have had such a thing as a practical speaking telephone all those years, and never sent it to the Patent Office, and never put it to use except for the gratification of mere curiosity. But when we come to look at his life, our amazement, — it is no use to say "amazement," the impossibility of believing that he could have done as he did if he had a speaking telephone, — it becomes, I say, enormously impossible that such a man, possessed of such an invention, could have done as Drawbaugh did. Not only that, we wonder, we are struck with amazement, we find it impossible to believe it. We find that not only the things that he did not do, but the things that he did do, exclude the speaking telephone from this case and from his life.

Among those is that card which I showed your Honor to-day (p. 53, *supra*). Would poverty permit a man to print a list of sixteen inventions and leave out the telephone which was to give him glory?

One of the most conspicuous witnesses — a particular friend — by the name of Holsinger, says that he lived alongside this man from the fall of 1873 to December, 1876, from a period two years before Mr. Bell's patent to a period after Mr. Bell's patent, and after Mr. Bell had become famous as the inventor of the speaking telephone. This man, Holsinger, was a printer by profession, had been an editor of a country paper, and is now. His story is that he was one of four or five men who helped Drawbaugh experiment with his talking machine. He says Drawbaugh's whole heart and soul were in those machines; he seemed possessed by some power by which he could never leave them. He says they not only got ordinary speech, but they tried something more difficult than common speech; common speech was not enough. They scratched on pieces of wood, and crumpled paper, and did other things; and the man at the other end would tell just what was being done. Speech was no test for them; they wanted something harder. Holsinger testified that during that time he did not know that Drawbaugh was working on anything except the speaking machine, unless it might be a magneto telegraph key. He says that he never knew that Drawbaugh was working at anything else. Holsinger is the man who printed that card. Holsinger says he did not know whether he worked on that telegraph key as completing a former invention or making a new one. By and by, we shall find from Drawbaugh's testimony a list a page long of the things he was working on *during those years;* all sorts of things. That is not all. Holsinger, in October and November, 1875, wrote newspaper articles for a country paper. One of them, about an octavo page long, had half its length, devoted to Drawbaugh, and what was going on in his shop. For two years he had been there, and he said Drawbaugh's heart and soul were in the talking machine; that it was the greatest invention that ever was, and he knew it. Drawbaugh was yearning to give publicity to it. And what Holsinger said in his newspaper article about Drawbaugh was that they were carrying on the manufacture of axles in his shop according to a patent of another man, and that Drawbaugh was making an electrical clock to exhibit at the Centennial.

Mr. DICKERSON. What page is that, and what exhibit?

Mr. STORROW. It is in the brief, page 201, and complts, ii, 1216. This printer was the one who printed the advertising bill-head I read to you this morning, as well as the card. He writes to the newspaper of Nov. 16, 1875:—

> "We have the pleasure of announcing to the wide world that our Milltown (Eberly's Mills) has now the new axle factory established in the old machine shop at this place by a company of four live and energetic members, one of which is our friend Wilson Bear, of Camp Hill, as general business manager, and M. N. Grove of Harrisburg, as corresponding secretary. They make the Kline conical compensating axle, a new invention of Mr. Kline's of Camp Hill, we wish them every success, for we think it is a very good improvement in that line.
>
> "ELECTRIC CLOCK WITHOUT A BATTERY is being gotten up in our town by Daniel Drawbaugh, to be exhibited at the Centennial next fourth. It will be one of the things not dreamt of by every one, and will be a great credit to the nation for its wonderful simple workings and great convenience."

He has got something which is a wonder; he is going to exhibit at the Centennial,— not the telephone that he has got, but a clock, which he is going to make. That is not all. What becomes of Mr. Holsinger? "Heart and soul in the telephone," and "never knew of his working on anything else." When he writes to the newspaper and puts it into print, the wonder of the world is the clock. Well, that clock attracted attention from time to time. This poor man in abject poverty could not raise $15 for a caveat.

We know it, because it is sworn to in the answer. In utter want of necessary tools and materials, even to duplicate his last perfect telephone, he makes an electrical clock. This particular one was about four feet high. When he got that done, he made another and another, and in 1876 and 1877 and the beginning of 1878 he made, out of his own resources, out of the depths of his own poverty, and in his utter want of tools and materials, — he made three electric clocks, from four to seven feet high, the last one being a handsome structure seven feet high, with a walnut case, with carvings; he had the castings made at the foundry; polished and finished them; had a compensation pendulum, etc. (See brief, p. 326.) That was when he had not tools enough to copy his last telephone, or means enough to raise $15 for a caveat. Well, that clock attracted the newspaper people. (See brief, p. 207.) It attracted the attention of his bosom friend, the newspaper writer, Holsinger.

In 1878 it was taken to Harrisburg and exhibited in a hall. He did not take it, but some man who bought it took it. It attracted a good deal of attention, and in the spring of 1878 a half dozen friendly newspaper writers go to the shop of this inventor of the telephone, at a time when the telephone was attracting everybody's attention, — getting into extensive commercial use, — these half dozen newspaper writers go there and come in contact with Drawbaugh. Now we are going to see what this man had. Nothing could be so sensational as the telephone for them to write about, if he invented it. The first newspaper writer, Musser, who had known Drawbaugh ten years, wrote about clocks. Drawbaugh and he spoke of telephones; Drawbaugh showed him one he had made, the tin can **B**, but did not attach much importance to the thing, and gave no hint that he was the inventor.

The next man who came along was Mr. Matthews, not merely a reporter, but one of the editors of the *Baltimore American*. This gentleman travelled from Baltimore to Harrisburg to see the clock. He meant to have an electrical friend go with him, who would understand it better than himself, but the friend could not go. He did not write his article at once after coming back, but wrote it six months afterwards. It was a long article. Drawbaugh knew him to be a newspaper man proposing to write an article. They spoke of telephones. Drawbaugh said that Bell ought not to be considered the first inventor of the telephone. Why? *Because it was found in a French book.* Then they went on, and Drawbaugh said he had experimented on the transmission of sound, but did not transmit speech, and never expected to. Mr. Matthews was called by us as a witness, and gives extremely interesting testimony. I will read part of the article that he wrote and printed in 1878. (brief, pp. 211 *et seq.*): —

> "It may be mentioned that Mr. Drawbaugh constructed a rude telephone long before Edison loomed up as the boss inventor. He never expected to send articulate sounds over a magnetized wire, but he believed that an alphabet could be arranged after the manner of the musical scale, and that messages could be transmitted and understood by the variations of tone and pitch. This unlettered country mechanic came very near anticipating Edison and Bell in the invention of the telephone. Nothing but his poverty prevented him from conducting his experiments to a successful issue."

That was Drawbaugh's own statement in his own behalf, — blowing his own trumpet to a man whom he knew was going to write a laudatory article about him in the newspaper, when Mr. Bell's instruments were in successful commercial use, and he knew it. After the article was published he received it and made no complaint. You may make every allowance that you please, for misconception, errors, faults of the reporter, faults of the newspaper editor, — although Mr. Matthews was a lawyer and had practised law for four years, — it is impossible to believe that one who said what led a newspaper writer to write that could have been the inventor of the telephone. But that is only the beginning of what he said to Mr. Matthews and to other persons.

[*Adjourned to Sept.* 23, 1884, *at* 11 *o'clock*, A. M.]

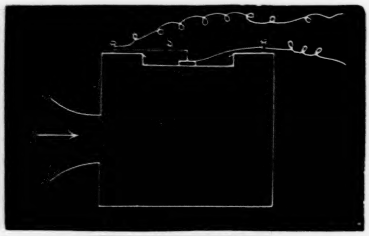
NEW YORK, Sept. 23, 1884.

May it please your Honor: There are one or two features in this tin-can instrument "B reproduced" which I showed you yesterday, that I wish to call your attention to again. I think it was explained yesterday how the varying currents, passing through these coils on this horseshoe magnet, varied the power of the magnet and thus its pull on that piece of iron which is the armature, and vibrated the diaphragm by the variations of pull which they exerted. When the varying currents produced in the transmitter are passed through those coils of the receiver, they will vary the magnetism of the iron cores which are included in these coils, and they will vary the pull which the magnet exerts on that armature or piece of iron which is fastened to the central part of the elastic diaphragm; and, as the pull is greater or less, it must follow that the armature and the diaphragm will vibrate in that way. Of course it is essential in an apparatus of that kind, first, that the armature should be within reach of the magnet. Although theoretically a magnet may extend its influence a considerable distance, yet practically the armature must be brought close to it in order to be seriously affected by it. If you put it an inch away you might as well put it a mile. In practice it is put as near a sixty-fourth of an inch as possible and within less than a thirty-second of an inch. It must also not be so as to touch; because, if, as it vibrates, it touches, it impairs the freedom of movement, and there also arises a difficulty which is known as "sticking." When the armatare actually strikes the magnet it seems to stick there; and it "sticks" quite strongly. This does not arise when you separate the armature and magnet by placing a piece of paper between; but when the two actually come in contact they "stick." Of course it is desirable that they should never come in contact, because they stick. There is no trouble in arranging them so that they will not stick; in every electrical apparatus that is done; and a man would readily know how to arrange it well. In using this instrument, this tin-can reproduction, in the tests which were made in New York, Mr. Benjamin experienced one difficulty, which occurred once or twice. In his endeavors to press the tin can to his ear so as to hear, he pushed against it, and it slipped once or twice under the strap which held it so that the armature came in contact with the magnet and it had to be drawn out again. Of course that is an inconvenience at the time, but it is nothing more than that, and it does not spoil the machine permanently, so to speak. The tin can is held down in this "reproduced" instrument by this broad strip of sheet iron. In this instrument, the original **B**, it is held down by this flimsy little piece of tin, held by two tacks only. It does seem impossible that that could have been used, without causing the same trouble or a great deal worse. It is a flimsy attachment with one tack at each end, and there never were any more tacks in it; there are no other tack holes, and it seems impossible that an intelligent mechanic, capable of making such a nicely organized arrangement as those which he made after Mr. Bell's patent, could have used B in that condition, without any attempt to remove that defect, when a moment's trouble, requiring no invention, but the simplest precaution, would have remedied it.

It seems impossible that a man could have used that half a dozen times without seeing the need of remedying that difficulty, and remedying it at once. A tack driven through the can directly into the board would have done it.

I now want to speak to your Honor of one other thing. I have told you what the speaking telephone was, and I think it will now be convenient to explain the Reis telephone. It is not a speaking telephone. Reis endeavored for a great many years to make a speaking telephone. He began about 1852 or 1853 to try to make a speaking telephone. He never succeeded, and the reason he did not make one was not because he was not a good enough mechanic to make what he wanted, and to construct such an apparatus as he had in his mind, but because he had not got the thing in his mind. He did not know how a telephone ought to be made, what it was, or how it ought to operate. He worked for years and years trying to make a thing which would talk. His idea was this. If I can make an electrical apparatus in which the sound waves, the air vibrations due to the voice, shall actuate it at one end, and in which the electrical changes produced by the voice shall actuate a receiver at the other end, I shall have produced at the listening end, by the voice of the speaker, sounds. He supposed that if they were due to the voice, the sounds would be the same as the voice. He made an apparatus, the mode of operation of which was such that when you pronounced a particular word at the receiver, you produced vibrations at the listening end, but failed to produce words. Reis made an apparatus which not only did not produce words, but what it did do was fatal to any approach to words. The thing which he did was this.

This woodcut will represent the essential acting parts of a Reis transmitter of one form. It consists of a box four or five inches square with a round hole in the top about an inch and a half diameter, across which is stretched a membrane *m*. On the middle of this is a little patch of metal at *m*, which you see, and that patch is connected by the wire which goes curling off to the right to one pole of a battery. A bent piece of wire *s* is so arranged that it is loosely jointed at the left-hand upper corner of the box, while its bent-over point rests by its own weight on the piece of metal at the centre of the diaphragm. The jointed end of this piece of wire is connected by a wire which you see in the cut that goes off to the receiver, and, passing through the coils of the receiver, continues to the battery. In this condition the current coming from the battery passes to the little piece on the centre of the membrane and then to the bent wire in contact with it and so on through the receiver. Now as that piece *s* is loosely jointed on the end, I can lift it up with my fingers, and the moment I lift it off from the patch on the middle of the diaphragm the circuit is interrupted and the current ceases; when I replace it, the circuit is closed and the current flows again. In that way I can, by lifting up the piece *s*, make and break the circuit and thus interrupt the current as often as I please. If I strike on the lower side of that membrane diaphragm with a little stick, this bent piece of wire, *s*, hinged to the frame of the box, will hop up and contact will be broken between it and the patch at *m* on the centre of the membrane, and the current will be interrupted. We frequently call *s* the hopping piece. I can thus break the circuit and interrupt the current by rapping with my pencil on the under side of the membrane or, indeed, on the upper side, instead of taking hold of the piece with my fingers. When the current thus alternately caused to flow and to be interrupted passes through the coils of any receiver, the core inside of these coils alternately becomes magnetized and demagnetized; it will then alternately attract and lose its hold upon an armature placed in front of it, and if that



Reis Transmitter.

armature be fastened to the centre of a diaphragm it will set that diaphragm vibrating. Each time the circuit is closed and the current flows, the diaphragm moves towards the magnet; each time the current is broken and the current ceases, the diaphragm will fly back. I can thus make that diaphragm waggle just as often as I make and break the circuit; if I can do that a hundred times a second, the diaphragm will vibrate a hundred times a second and produce a sound whose pitch corresponds to that frequency.

Striking the membrane with my pencil or a little stick is not the only way to make it vibrate. Suppose I speak into the open mouthpiece where the arrow is; the sound vibrations due to the voice will also shake and vibrate that membrane *m*, and if the parts are properly proportioned and the hopping piece *s* is made quite light, these vibrations will throw it up in the air and break contact and interrupt the current. If my voice, speaking in this mouthpiece where the arrow is, produces vibrations at the rate of one hundred a second, then the membrane will vibrate at that rate, and will make and reak the current a hundred times a second, — interrupt the current a hundred times a second and make the receiver, worked by its interruptions, vibrate a hundred times a second, and I shall get a sound of the corresponding pitch. But, as I have already explained to your Honor, an apparatus which works merely by interrupting the current with a frequency corresponding to the pitch of the voice, while it will produce a sound of the requisite *pitch*, cannot give any articulation, for it fails to take note of those peculiarities of vibration which occur during the time when there is no contact and the current has ceased, and it introduces other troubles. That mode of operation is perfectly incapable of transmitting speech. That is why the Reis is not a speaking telephone.

If you look at that, and are familiar with modern microphones, you will be struck with a certain resemblance. I explained yesterday that a microphone, which might be represented by a diaphragm like this, can be vibrated by the voice as to vary the pressure *without* ever breaking contact. This instrument of Reis was so devised, constructed and arranged, that whenever the voice is applied to it, it *will* break the contact; that is what he made it for. That is what it accomplished. That is the mode of operation which he intended it to have. That is all he hoped from it. He found after years of experiments that the thing would not talk; why, he never knew. He did not know that in a microphone the essential thing is that these parts shall never part company; that the pressure which one exerts on the other must vary, but that the parts shall be so arranged and proportioned and constructed and mounted, with springs or otherwise, that while they vary the pressure they never shall part contact, because if they do, it ceases to be a speaking telephone and becomes merely a kind of musical instrument.

Why is it that the microphone, which has a good deal of resemblance to that, as you look at it across the room, operates in one way, while this operates in another? I will not stop to explain fully why. There are a great many contrivances introduced in the microphone to give it its due and proper operation, which are not now material to be considered; but one of them, to which I alluded yesterday, is the fact that it has a weight to it. You see, as I play with this Reis transmitter, a strong blow on the diaphragm will make the hopping piece fly up quite a distance; a lighter blow, a less distance. It will be the same thing if I apply the same force by means of air vibrations; if I give it a strong blow, it will break the contact; if a light one, it will not. It can be so arranged that a given strength of vibration will not break the contact. If I should weight the part by putting an ordinary copper cent on the free end of *s*, the ordinary vibrations of the voice would not be enough to throw it up and break the contact. Even though that was made very light (and Reis intentionally made that very light), it might happen, because of the thing sticking, or because the voice was a little feebler than was expected, that for a moment it would not fly up and part contact. But Reis did not intend that. He instructed the public in his descriptions and advertisements (because he sold this thing quite extensively to colleges as an interesting scientific toy) that it was to be so used as to break the contact. But it might happen that a given tone of voice would not quite break the contact. Now, if it did not break the contact, what would happen? Why, the force of the voice, making a single vibration upwards, not quite enough to throw off that hopping piece and break the contact, might yet develop an increase of pressure at the point of contact; a little upward motion, not enough to throw that off, but sufficient to exert some force which would be manifested by a slight increase of pressure.

There you have very nearly the condition of the microphone. So it might happen that that instrument of Reis, although described and intended to be used normally and naturally with sufficient force to effect that vibration, might, once in a while, stick on that contact, and then it would be for an instant under conditions which would produce this true undulatory current, and a word might perhaps come through. I do not know whether a word ever did, but it has been asserted that occasionally words would get through. Mr. Benjamin, the defendants' expert, says in substance, that although this instrument is not a speaking telephone, and although Reis did not invent the speaking telephone, for he had not conceived the mode of operation which it is essential to base a telephone on, yet that it might happen now and then that this would stick on the contact, and that something like a word might get through (defts, ii, 1187). That, your Honor will see, is the state of the art which had been reached before the inventions, actual or alleged, of the two parties now before your Honor. The trouble with that was, not that Reis did not have the mechanical skill to make what he intended to make, but it was that what he intended to make was entirely a wrong thing. He had not got the right mode of operation. He had not got the right idea. He had not even got the notion in his head that the repetition of articulation, or the creation of articulating vibrations at the receiving station, required that they should be of a "*form*" appropriate to repeat a word as well as of the frequency to repeat the pitch. He could control the pitch, but he could not control the "*form*" of vibration. He does not seem to have had an idea on that subject. He does not seem to have known that this was required. He did not invent an apparatus to do that, because he did not know that it was to be done. It was a matter beyond his mental horizon. The chief promulgation of discoveries about the "form" of sound waves and the form of articulation came along some years after Reis's invention; they were fully announced in German in 1863, by Helmholtz, but not translated into English for a number of years thereafter. They were not known, except to well-educated men, even in 1876.

We might have said of Reis, and Reis might properly have said of himself, when the Bell patent came out, that he had been working at the attempt to transmit speech for twenty years. He had for more than twenty years; and he had failed; not because he did not make a nice enough instrument to perform the operation he intended, not because he did not have good enough mechanics, but because he did not know how to transmit speech. It was an old problem, a thing that people had worked on and talked of for a great many years, — attempts to transmit speech.

Mr. Bell was not the first who desired to transmit speech. He was not the first who experimented with the hope that he might learn how to do so, but he was, — apart from whatever Drawbaugh may or may not have done, — he was the first who told to the public how to do it.

Your Honor will kindly look at complainants' Vol. I. p. 540.

The COURT. Is the reference in your brief correct?

Mr. STORROW. Well, sir, yes, in a sense. Our brief, p. 211, contains all the reference about it. It had better be changed to complts, i, page 540. The article to which I refer is printed twice in our record; in Vol. IV. of Exhibits, p. 327, which is intended to be the reference in the brief, and Vol. I., bottom of page 540. That is the whole of the article of Mr. Matthews, beginning on p. 540, — the article in the *Baltimore American*.

I forget whether I said yesterday, — I think I did not, — that Mr. Matthews went there expecting to have an electrical friend go with him. The electrical friend didn't go. The consequence was, when Mr. Matthews returned he didn't write the article at once, expecting to go up again with his electrical friend. But the second visit never took place; and in the fall of 1878, about six months afterwards, he saw in the paper an account of a perpetual-motion machine or motor, built by Gary, which was to run by utilizing the force of a permanent magnet, or something of that kind; to run without winding, without a battery, and so on, and he said — probably not believing in perpetual motion, of course — that there was as much perpetual motion in Drawbaugh's clock as in that thing or in anything else; he therefore would write an article about Drawbaugh, which he did. It is in the book, two pages and a half long, and it closes with the paragraph which I read yesterday and which I will read again.

Your Honor will find the paragraph at the bottom of p. 542. If you should read the whole article you would find it extremely laudatory of Drawbaugh. Mr. Drawbaugh says that he knew Mr. Matthews's was a friendly visit; he perceived that at the time, and he knew he was a newspaper editor (defts, ii, 1075-8, 1090-1).

> "It may be mentioned that Mr. Drawbaugh constructed a rude telephone long before Edison loomed up as the 'boss' inventor. He never expected to send articulate sounds over a magnetized wire, but he believed that an alphabet could be arranged after the manner of a musical scale, and that messages could be transmitted and understood by the variations of tone and pitch. This unlettered country mechanic came very near anticipating Edison and Bell in the invention of the telephone. Nothing but his poverty prevented him from conducting his experiments to a successful issue."

Now that is his own statement and in his own favor, to a gentleman whom he knew was about to give him notoriety, when they had been discussing the telephone, then making a great noise in the newspapers and coming into successful commercial use. That is what he says to a newspaper writer in search of a newspaper article, — a laudatory article; and there is nothing in that article which Reis could not have said. Reis was experimenting twenty years before. He never conducted his experiments to a successful issue. He didn't know how. He didn't get speech; he finally gave up the idea of speech. When, therefore, you learn, either from that, so far as the man's own statement after occasion for a boast came in is to be read in his favor, or, if you learn from anything else, that he was at work on a talking machine, if you please to say so, or trying to make it, you have got nothing which will help you towards this case.

Now if your Honor will turn to complainants' Vol. IV. p. 398, — the thickest volume there is Vol. IV. of Exhibits.

Mechanicsburg was a considerable town, the largest in that immediate neighborhood, about four or five miles from Drawbaugh's shop. He lived in that town from the spring of 1876 to the spring of 1877, bought a house there, owned it and lived in it. Then he moved back to Eberly's Mills and let his Mechanicsburg house.

There were two or three newspapers in Mechanicsburg; two, the *Saturday Evening Journal* and the *Independent Journal*, were both published in the same office, almost different editions of the same paper,— published by the same editor and in the same office.

They had published articles, so it appears in the record, about the telephone, mentioning Mr. Bell as the inventor, as every other newspaper had. In the spring of 1878, one of the writers for that paper went to Drawbaugh's shop to see his curiosities; and, in short, talked with him, saw whatever Drawbaugh showed him, and, among other things, talked about the telephone. But what he brought away from that shop and wrote in his paper was not that Mr. Drawbaugh had invented the telephone, not that he had had a telephone for twelve years or ten years, but that he was *then* engaged, just as your Honor knows hundreds and hundreds of others then were, in inventing a new kind of telephone.

Let me read the particular paragraph. The first article (at the top of page 398) begins by describing the string telephone, of which your Honor knows, I suppose, and which is sometimes called the "lovers' telegraph." There is no electricity employed; it is an entirely different thing. It is generally made of two tin cans, the end of which is covered with bladder (not unlike that on your Honor's desk), and connected by a string. You speak into one end and the vibrations are mechanically transmitted along the string just as they would be through the air, vibrating the diaphragm at the other end; and what you speak in the one tin tube you can hear at the other. It is a mere mechanical contrivance. I don't know whether your Honor has ever seen one.

Mr. Dickerson. They are sold here on the street, as a toy.

Mr. Storrow. They have nothing to do with electricity and do not depend upon that at all; they could hardly be called a speaking telephone, although they are in a sense speaking telephones. You can speak from one place to another, but not as you can through a speaking telephone. People have used them for some time, and have improved and perfected them very much, so you can speak half a mile with them. They have become so perfected that the string or wire can be carried around corners and on poles by various contrivances, and are used quite extensively in this country, and have been for many years; there are some lines I think, half a mile long.

Mr. DICKERSON. The countrymen use the ordinary wire fence as a telephone.

Mr. STORROW. This article first describes the string telephone, which it says the boys and others were putting up around Mechanicsburg, and continues (complts, iv, 398; brief, p. 209): —

> "We have been informed that Daniel Drawbaugh, the celebrated mechanic of Eberly's Mills, *is* inventing a telephone on a different plan from that now occupying the attention of the scientists, which will produce the sounds louder and plainer than the mother invention."

And then it goes back to the string telephone, describing one put up in the town. There is the writer; he is a neighbor and acquaintance of Drawbaugh; going to his shop in 1878, — the shop of the man of whom this story is told. Drawbaugh *now* says he had been at work on telephones for ever so many years; that he had these perfect microphones; that he had been experimenting with a telephone for ten years, telling the public freely all that he had got. But what this newspaper writer learned was that Mr. Drawbaugh is *now* inventing a telephone which will be better than the mother invention; not that he originated the mother invention, not a bit. That is all that newspaper writer in search of a sensational article learned. He had all these telephones within reach of his hand if their story be true; he could not have helped knowing if their story be true, that Drawbaugh was the man who originated the telephone which he and everybody else had been attributing to Bell; and yet he said not a word about it.

Then a week or ten days afterwards he wrote another article in the same paper. I don't know whether it was the same man, but it came from the same office (complts, iv, 398; brief, p. 209): —

> "At Eberly's Mills, this county, is an establishment that rivals Dickens' 'Old Curiosity Shop' in many particulars, and in some instances outrivals it. About the time of the Revolution, we suppose, it was a grist and flour mill, and when it ceased to grind out flour for the bread of life, it passed into the realm of mechanics. For many years it has been the laboratory of Daniel Drawbaugh, the well-known successful inventor. There is nothing engages the attention of the scientific world that does not also interest Drawbaugh."

That is a curious expression to apply to a man who is an "original" inventor, that, when a new thing came up in the scientific world, and engaged others' interests, *then he* begins to take hold of it.

> "His fancy in the mechanic arts is oddly assorted and various, as can easily be imagined. His inventions have been many and useful, and his prospects for turning out something great and wonderful, as bright as ever. Among some of his best productions are nail machines, faucets, and electric clocks."

There is another list of what he did, — "his best productions" — with the telephone left out. If a man were going to name the best productions of a person he had spent an hour with, who had had these instruments long before Bell was heard of, who then had instruments in his laboratory — if the story is true — far surpassing the best in commercial use to-day, would he name as the "best" the nail machine, the molasses faucet, and the electric clock? Your Honor has the list of machines; it would take some time to run over them all. The article continues: —

> "Of this last invention he has quite a number constantly keeping time in the old mill. One has been running for more than five months, and has not varied from the true time over a few seconds. It has been examined by scores of people, about two dozen of whom have given orders for clocks of the same kind, which is encouraging to the inventor. Mr. Drawbaugh is an indefatigable worker in his special line, and never gets discouraged. He labors like he talks, with a rush and gush that nearly bewilders his auditors. He can talk more theoretical and practical science in half an hour than an ordinary mind would gather in half a lifetime. We are under obligations to him for much information in general, and telephones in particular, and the *Independent Journal* will be glad to announce the completion of the new telephone he is now constructing, and hopes the speaking machine will bring many dollars into the pockets of its ingenious inventor."

After that, may it please your Honor, after they had offered him the columns of the newspaper, he went to see the editor, so one of our witnesses testifies; Mr. Grissinger says that shortly after that time, in that spring, Drawbaugh came to his shop in Mechanicsburg with a pair of telephones in his pocket, — little magneto instruments **D** and **E**, — and he said he was on his way, or had just been to see Mr. Thomas, the editor of the newspaper (brief, p. 210; complts, i, 530).

Well, the next article that came out in that paper about telephones was to the effect that an Englishman had invented a microphone, — yet never a word about Drawbaugh's.

The next thing that took place in the order of events — perhaps not the next, just before that — there appeared one of the articles that I have spoken of, in addition to these, about the clock. A short article appeared in one of the Harrisburg newspapers, about the 1st of February or 2d of February, 1878, saying that Drawbaugh had got a remarkable clock which went by electricity from the earth, and never needed winding.

That started up a couple of gentlemen in Harrisburg who went over to see him, thinking that the article had not done justice to him, and they would do better. Those two gentlemen were Mr. Lloyd and Mr. Worley, school teachers of Harrisburg. Mr. Lloyd was an old friend, and had known him about ten years. He was principal of a grammar school, and Mr. Worley was principal of a high school. Mr. Worley had known him about ten years; had met him in Harrisburg; had been to his shop several times; had talked with him about electricity. Mr. Lloyd was a man given to electricity; he occupied a part of his time electroplating small articles of hardware for hardware dealers. He had that kind of intimacy with Mr. Drawbaugh which, although not as constant as that of a laborer living next door to him, was just of the kind to draw out from him the story of the telephone, if he had had a telephone. In all those ten years Mr. Lloyd had never heard a word about it; among his other inventions he had never seen that. Drawbaugh at one time brought his electrical clock and some of his other inventions to Harrisburg and exhibited them; took Mr. Lloyd to see them, but never spoke of telephone to him. He knew nothing about any such thing.

These two gentlemen went over and saw the clock, and they wrote an extremely laudatory article about that, saying that the State ought to make an appropriation and buy one and put in the Capitol.

I read from complts, ii, 1551, an extract from the Harrisburg *Telegraph* of Feb. 13, 1878, written by these gentlemen in consequence of their visit: —

"At Milltown, one mile from White Hill Station, on the Cumberland Valley Railroad, can be seen one of the most finished and unique clocks ever constructed by mechanical genius. It was invented and built by Mr. Daniel Drawbaugh, who, although rather unused to technical terms of the schools, is deeply versed in nature's secret workings. His invention is not the result of blind groping in the dark and accidental stumbling upon a new application of power, but the triumph of systematic research, patient investigation, and remarkable mechanical skill. The magnetism of the earth, an inexhaustible source of power, is made to oscillate the pendulum."

The COURT. It is hardly necessary to read all that here, to take up the time of the Court.

Mr. STORROW. Those gentlemen, one of them an old friend, found that to write about him in his praise; that was all. But they talked about the telephone, at that visit; both were called to the witness stand and testified that he said he was experimenting on telephones in the year 1878; this was in the spring of 1878, when Mr. Bell's telephone was out and thousands were in commercial use, and hundreds of people were experimenting on telephones.

It is in proof in this case that an army of inventors were at work, as is always the case when a new art is created, in trying to improve the instruments. (Defts, ii, 1259.)

He told them that he had made an instrument. That I may not misstate it, I will quote the language. Mr. Worley's testimony is in complts, ii, 1554:—

"*Ans.* 17. In speaking of the applications of magnetism, he was experimenting for the transmission of sound; but, while he could produce sound, it was indistinct and confused, and he thought of remedying that by receiving the sound in a box to which he could apply the ear."

Mr. Lloyd testifies that what he said to him as he remembers it was that he had produced sound by electricity, but that the sound produced a kind of back lash, and that he intended to control it by some means "that I cannot describe to you now."

He had, according to that phrase, got something which was like the sound he wanted; but it was not right, it was not plain, it was not distinct, it was not articulate, and he was trying to remedy that defect by controlling the sound "by some means that I cannot describe to you," says one. Says the other, "by receiving the sound in a box" to which he "could apply the ear." (Brief, p. 208. See especially brief, bottom of p. 219 and top of p. 220.)

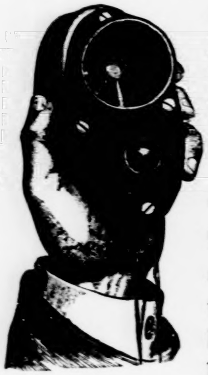
He was plainly a man who had got a telephone that didn't talk or didn't talk plainly, didn't talk well, and he was trying to improve it by a little mechanical contrivance connected with the receiving instrument to make it a little better. This is very much like what he said to the Mechanicsburg writer; he was trying to make a new kind of telephone which would produce sounds louder and plainer than the mother invention. Everybody was trying to do that.

Speaking telephones were introduced into commercial use in Harrisburg about January, 1878. A lot of newspaper extracts are put in evidence stating the way they were introduced and spread in Harrisburg. Harrisburg is three miles from Drawbaugh's shop, in sight of part of the village. About May of 1878 he went to the telephone office in Harrisburg; the telephones were then put out there by the Western Union Company; there was a quarrel between them and the Bell Telephone Company, and at that particular place the Western Union Company were putting out the telephones.

Drawbaugh went there under very peculiar circumstances. There was a man by the name of Stees, now dead, living in Harrisburg, superintendent or manager of a saw mill. He had a telegraph line from his office to another office, which he had used for about eight or ten years. He had had a great deal of trouble with it because he wasn't a good operator, nor were his clerks, and they had tried different instruments and were very much dissatisfied. The moment the speaking telephone came into use, he put them right on to his existing telegraph line, took off his telegraph instrument and put the telephone on, and was one of the very first who put them on.

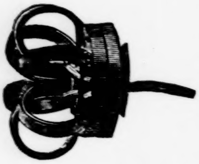
Drawbaugh in that spring went to Mr. Stees's office to try the commercial telephone. Mr. Stees had the usual faculty of grumbling at what was furnished to him by everybody, and he went on one occasion to the office of the Western Union Company and said to them, "Old Dan Drawbaugh is getting up a telephone that will beat yours" (complts, ii, 1035). That is all he ever said to them about Drawbaugh in connection with telephones.

Now, Mr. Stees had known Mr. Drawbaugh for ten or fifteen years, had been concerned with him in some enterprise, they got up a stamp canceller in 1865, and that was the remark Mr. Stees had to make then, — for whatever it is worth, and that is a good deal.



Presently he took Drawbaugh to the telephone office and introduced him, but not as the inventor of the telephone. He introduced Mr. Drawbaugh, and said that he would like to look at the telephones in the office. They showed him one. It was opened at Drawbaugh's request, and he saw the inside of it.

This is the pattern, — what is known as the "snuff box" with the mouthpiece off at one side. This is the one they showed him. He opened it and looked inside. Either that day, or a day or two after, or at the time when he opened it, he had with him his own instrument **A**. One cannot but see a certain resemblance between the two. He had this instrumment **A** with him, which, according to his story, he had had for four years. He showed it to the telephone manager and asked the latter, "Is yours patented?" "Yes." Then says Mr. Drawbaugh, "Mine will not do; it is too much like that."



The next thing he did, he went not long after, within a few days or a month or so, again to the telephone office, and asked them would they do him the favor to loan him one of their instruments, which they did. He took their instrument, a "Phelps Crown," said he wanted to study and examine it, carried it to his shop, kept it a fortnight and brought it back again.

Now, if this story is true, he had for four years, yea, for ten years, instruments which put these all out of sight. If his story is true, he then had at his office in his shop, microphones which far exceeded anything thought of then; yet he went through that experience and never said to anybody concerned in that office, "Why, I am the man who invented this thing years and years ago." (See all this in brief, p. 221.)

Next, in the summer of 1878, a man by the name of Scott, a publisher, undertook to get up a history of Cumberland County, one of these county histories which are not uncommon, and he employed a Mr. Nesbit to write a sketch or history of the town of Lower Allen, the town in which Eberly's Mills, where this man lives, was situated. (All this about the history and autobiography is in our brief, pp. 222–225.)

Nesbit, and Hull who assisted him, went there and saw one or two of the old residents. This was early in August, 1878, or the last of July. They went to Drawbaugh's shop, talked with him, had quite a talk with him, and wrote a sketch or history of that village, — a village of about twenty houses, and seventy-five inhabitants, containing a grist mill and this machine shop. They wrote a sketch or history of that village in Drawbaugh's shop while there. The original manuscript, written in that shop by Mr. Hull, was produced by Mr. Nesbit and identified by him. Mr. Hull is dead. It was, of course, rewritten and modified a little before it was published. It was published and will be found on complts, i, 689. It makes about two thirds of a printed page.

Half of that article was devoted to a description of Drawbaugh's shop (brief, 223; complts, i, 689): —

> "What was once a clover mill has been remodelled and fitted up as a machine shop. The present proprietor, Daniel Drawbaugh, some years since formed a stock company for the manufacture of measuring faucets and rotary pumps, and for a while the machinery was used for the purposes of this company; but finally the faucet machinery was removed to Mechanicsburg, and the works were much reduced. They are now applied, under the care of Mr. Drawbaugh, to the manufacture of his patent electric clock, which is a marvel of ingenuity, and promises to supersede all other clocks. They are said to be run by a turbine wheel of fifteen horse-power, and to be worth not less than $7,000."

It is not conceivable that a man wanting to blow the trumpet for that county, for that township, for that village, and getting up his trumpet in Drawbaugh's shop, should have left out the speaking telephone, if he had the least intimation that Drawbaugh claimed to be the first inventor.

Mr. Nesbit testifies that no such information was given him.

Besides that, Mr. Scott, the publisher, went to Drawbaugh to obtain his subscription. Drawbaugh subscribed $10 for this history, on condition that they would publish his biography in it, and they did. The arrangement made was that he was to write his own biography for them; not an uncommon arrangement where money passes in that direction, where it is the author who pays the publisher, and not the publisher the author. Mr. Hull and Mr. Nesbit were engaged by the publisher to write the *history*, or the part which I have read, but not any biographies. In an appendix at the end were a number of biographies got from other men in the same way.

Mr. Scott testifies that he had some blanks with questions for people to fill out who were proposing to print their biographies. He read those questions to Mr. Drawbaugh, and Mr. Drawbaugh had so much to say to him, "that his paper was not big enough; so he told Drawbaugh to write it out himself and send it, all he wanted to say." It was so agreed. Mr. Scott received by mail a biography which he understood came from Mr. Drawbaugh. It was put in the hands of his daughter, Mrs. McDowell, to revise, or perhaps prune down a little for publication, and after some pruning it was published. It covers about a third of a printed octavo page.

When we were taking this testimony, this took place. I called Mr. Nesbit, who had to do with the article, but nothing to do about the biography; he so expressly testified, and Scott, the publisher, so expressly testified and is not contradicted. He proved the writing of the historical part to which I have already referred your Honor. Then I proposed to prove the biography, and for that purpose I had Mr. Scott, the publisher, hunt everywhere to see if he could find the original manuscript, but it was all destroyed when the printing was finished. His daughter, Mrs. McDowell, then living in Cincinnati, had been brought to Philadelphia where the evidence was going in, to testify about that article. We had been extremely anxious to get the original, because if we could have got the original article in Mr. Drawbaugh's handwriting, it would probably have given us some information. The best we could have was the thing as printed, and Mrs. McDowell's recollection that she left out nothing of importance, and that she certainly didn't leave out anything about the telephone.

While cross-examining Mr. Nesbit, the defendants, evidently expecting this, produced from their own possession what they asserted to be, and what undoubtedly is, the original draft of the biography. It is in the handwriting of Mr. Hull. It was not the copy that was sent to the publisher. Mrs. McDowell thinks that was in Drawbaugh's handwriting. This was a copy or rough draft in pencil produced by the defendants themselves. Now we have all we want, — the rough draft of Drawbaugh's own biography, or his autobiography in his possession. And it is enough to settle the case. It doesn't spare epithets any more than such biographies generally do.

I read from complts, i, 705: —

> "DANIEL DRAWBAUGH. One of the greates inventive geniouses of *this* [the] age (so prolific of great men) is the subject of this sketch,"

Upon the occasion when he published his advertising card in 1874, modesty forbade him to mention his telephone; but part of his modesty had been gotten over by this time.

> "Danl Drawbaugh, who was born in the year in the quiet secluded village of Milltown three miles S. W. of Harrisburg where he has spent the greater portion of an active life conceiving & producing as a result of the conceptions of an unusually fertile brain, a score of useful ingenious machines & devices. It appears [that the] *by an* [in] examin*ation* [ing] the list of his inventions that the leading manufacturing intrests of the place (Milltown) in [his youthful] *his* boyhood days, gave direction to his thought & incentive to action. We propose to give herewith a sketch of his inventions but are sorry that we cannot accompany it with [a] *such* a discription of each as their importance merits His first invention was an automatic sawing machine, then a No. of machines used in wagon making next a machine for boring spoke tenets then a machine for sawing tenets a barrel stave jointing machine, patented 1851 this machi
> was pretty generally introduced & its merits apreciated, an *ated*
> matic grinding machine was next invented to meet a deman chines
> by the introduction of the jointer, then followed sever patented
> dressing
> for making staves heading & shingles all of which *these* were
> 1855 after which machine for rounding headin for dressing
> & finishing outside of barrel were [next] *grain* in mills.
> ents in nail plate
> again followed by a device for running m gn in tacks Photog-
> millstones & a device for elevating himself for action in gh
> He then invented & had patent ground and fitted acr
> feeding next a tack machine *& pictures.* necesoray chemical Patent
> raphy next engaged his at Next electri eaver to loo
> this field, by manufacturi
> matic lenses for camera prep s &
> improved *the* process for enlarging ppears from ity &

electric machinery attracted his attention and an electric machine was produced throwing out of consideration the galvanic Battery and [voltaic] *electric* pile, then a machine for alphebetical telegraphing; then the justly celebrated electric clock & the machinery necessary for its construction & several kinds of telephones one of which [was] is opperated by Batery and another by induction It will be seen from the foregoing that Mr. Drawbaugh has has penetrated vast fields in search of information & with what success, we leave the reader to determine. We are proud to own Mr. D as a citizen of our Township & deem him worthy of a position (of) at the head of the list of our prominent men and are hapy to accord him that position," — for ten dollars.

There is the list, there are his inventions, — every one of them. I will come to the telephone presently, but unless there is something different about that, all of them were *improvements in old and well-known devices,* — improvements in shingling machines, in nail-making machinery, in photography and so forth. He was plainly a man who picked up what was going on, experimented and entertained himself with the luxury of experimenting.

When we come to the last clause, "electricity and electric machinery" are mentioned, "throwing out of consideration the galvanic battery and electric pile."

There is no trouble in recognizing that as the magneto key which worked without a battery, as a small dynamo machine, or small call bell would.

"Then the justly celebrated electric clock, and the machinery necessary for its construction, and *several kinds* of telephones."

Would anybody speak of Howe as inventing "*several kinds*" of sewing machines? Or, would anybody speak of Mr. Bell as the inventor of "*several kinds* of telephones"? One man invents *the* telephone. Other men invent "several kinds" of telephones. Four months before he wrote that, three newspapers, from two of which I have already read, and another newspaper in Harrisburg from which I have not read, announced that Mr. Drawbaugh is now engaged in constructing or inventing "*a new kind* of speaking telephone." "*Several kinds*" by this time, and that is all he had to say about it.

Now I come to his next statement about telephones. You must remember that these articles were written and printed, not at a time when the telephone did not attract attention. There has never been a year when the telephone attracted so much attention, perhaps, as the year 1878. The novelty had not worn off. It was still marvellous, startling, surprising. Many people had not seen it. It was not only marvellous and startling, but the speed with which it was coming into commercial use promised a fortune to the owners of the patent.

Theodore Grissenger, of Mechanicsburg, was a dealer in agricultural implements, apparently a man of some means, a man who has made several inventions and taken out some patents himself. In April, 1878, he and his brother Jacob, and his brother-in-law, Jacob Shettel, the latter a connection of Drawbaugh's by marriage, became Drawbaugh's partners in the matter of the manufacture of electrical clocks. They paid him $500 down for their share, and were to pay all the expenses, etc., and for his labor in making clocks, and he was to receive certain other money out of the profits and proceeds — a certain share of the proceeds. Not long after the 1st of April, Mr. Grissinger, being one day at Mr. Drawbaugh's shop, said to him jokingly, "You had better have invented the telephone; there is more money in that than in the clock." Then you have the reply of Mr. Drawbaugh, "I did something in that way." Whereupon, Mr. Grissinger pricked up his ears and he thought, "There is money in telephones; I know that; and if this man has done anything, I would like to have a hand in that business." So he asked Mr. Drawbaugh a few questions, and the conclusion he came to from Mr. Drawbaugh's statements which he made to him was, in substance, that he had experimented some, but had not got any results,— had got nothing to show for it. (Brief, p. 220; app. 409.)

Next we find that Mr. Drawbaugh went to the office of Mr. *Theophilus Weaver*, a patent solicitor of Harrisburg, who was employed by this Clock Company to take out patents on the magnetic clock, which had never yet been patented. He had sold the clock before it was patented; and the purchasers were to bear the expense of patenting. Mr. Weaver had known Mr. Drawbaugh for ten or twelve years, and had been intimate with him, and they had talked much upon mechanical matters. Mr. Drawbaugh had been in the habit of going to his office and reading the Patent Office reports, from time to time, and he had got Mr. Weaver to look up the state of the art on various subjects. All this appears from Mr.

Drawbaugh's own cross-examination, and from letters and other papers that are introduced. During all those years Mr. Weaver never heard that Mr. Drawbaugh had a telephone. Now, here was a man consumed with a desire to get that thing patented; there was a fortune in it for him when he got it patented. You must bear in mind that he could have gone to the office of Mr. Weaver, and Mr. Weaver, without the $20 (which was his fee for taking out a patent), would have done it quick enough on credit for such an invention. During all those years Mr. Drawbaugh had been discussing with Mr. Weaver one contrivance and another, but never mentioned the telephone. That is not a matter of memory, merely; Mr. Weaver goes on the stand and testifies positively to it and is not contradicted; but it is not a matter of memory merely. Why, if such a thing had been brought to Mr. Weaver before telephones came into use, an application for a patent would have gone to Washington within twenty-four hours. Mr. Drawbaugh does not pretend that one word was ever said to Mr. Weaver on the subject.

Drawbaugh was examined and cross-examined, and on cross-examination was asked once or twice to whom he had applied for aid. He named two or three persons, but he did not name Mr. Weaver; but he did say that he had had Weaver look up the state of the art about other subjects on several occasions. Mr. Weaver, upon one occasion, examined Mr. Drawbaugh as a *quasi* expert witness. He was conducting an interference, and put Mr. Drawbaugh on the stand to testify about the models; that was in 1875. One would have thought that in the intercourse about that interference in his shop the subject of the telephone would have been drawn out; but nothing of the kind was said. In the spring of 1878 we find that Weaver was drawing an application for a patent on the clock, and Mr. Drawbaugh was in his office, and the conversation turned on the subject of telephones, which were then in extensive use in Harrisburg, and Mr. Drawbaugh said, and Mr. Weaver's answer is a long one, so I will read the most important part (complts, i, 398):

"That he, too, had experimented on the electrical telephone years ago, and before Bell came out with his invention, and that he had some results, but that they were not of such a satisfactory nature as to go ahead at the time with his experiments; that he had given up his experiments for the time being, and now it was too late for him to hope to have any standing as an inventor of the electric telephone." (Brief, p. 221; app. 390.)

Now, if your Honor will observe just what that is, and what Mr. Drawbaugh said about it. It was not a question whether he had made a successful telephone out of his own head, and did not know whether it was before Mr. Bell, or that he did not know what Mr. Bell's date was; but, as he stated it, it did not turn on any knowledge of the date; it was that he had never done the *thing*. He said, in substance, "What I did was years ago, but it was not a speaking telephone." Reis could have said that. At this interview with Mr. Weaver, Drawbaugh not only told him what I have read to you, but also told him that he was *then trying to improve the telephone*, — to make the sounds louder and more violent, — the same kind of statement which got into the newspapers of that month and which was mentioned to Lloyd and Worley and by Stees (pp. 109, 112, 113, *supra*); and he made a sketch of an amplifying lever to be attached to the diaphragm for the purpose of giving a greater range of motion; and that sketch is preserved, and it has been put in evidence; and it is not only put in evidence, but it is written on the back of a rough draft of the magnetic clock application, which was not begun until about the 1st of May, 1878; that fixes the date. So that there is no doubt about that incident. There is no doubt about the date. There is no doubt about the fact. If there is anything in Mr. Weaver's testimony which is not just what it ought to be; if he has overstated, understated, omitted or added anything, Mr. Drawbaugh could have gone on the stand to contradict him, but *he has not dared to do it;* after Mr. Weaver testified, the defendants examined two hundred and thirty-eight witnesses, *but they never produced Mr. Drawbaugh.* There was a diaphragm; and a lever was hinged at one side which extended to the centre of the diaphragm, and a motion given to the centre of the diaphragm would be greatly amplified at this end of the lever.

Mr. Dickerson. A mechanic would have thought of that, and so would any electrician.

Mr. Storrow. In Harrisburg there has resided, for nearly twenty years past, a dentist; his name was Dr. Moffitt, and he was rather an intimate friend of Mr. Drawbaugh. He had known him for twenty or twenty-five years, and he was called as a witness for the defendants. From a period as early as 1870, and some time before that, he had been in the habit of going to Mr. Drawbaugh's shop, partly for trout fishing in the neighboring run, and partly "on account of the interest he took in Mr. Drawbaugh's numerous inventions"; "almost any mechanical pursuit the man was working on, being interested that way myself to some extent." He was himself somewhat of an inventor, and had taken out a number of patents, and was interested in that way, appreciative of such things. He is called as a witness for the defence; and I am going, by and by, in another connection, to call upon your Honor to consider this testimony, as to what he knows and its effects. It is certain, that he did know all that Mr. Drawbaugh had done that was generally known to the community. With his knowledge, a man, to be presumed of respectable education from his profession, interested in inventions, with an acquaintance with Mr. Drawbaugh of twenty years' standing, visiting his shop on account of the interest he took in Daniel Drawbaugh's various inventions, Drawbaugh would have disclosed to him the speaking telephone the moment it existed.

In the fall of 1878, Dr. Moffitt determined to embark with Mr. Drawbaugh in some invention, and the one that he selected was another improvement in molasses faucets, — an improvement on an improvement in molasses faucets. He solicited to go in with him as another partner, Mr. Chellis, the storekeeper in Harrisburg, who kept the ninety-nine cent store there, a very enterprising man, and a man apparently of considerable means, and one of the defendants in this case (he is one of the three, as I explained yesterday, who got three quarters of Drawbaugh for nothing in May, 1880, and expanded him into five millions of dollars, — not directly into hard money, but into five millions of stock). They considered and determined to go in with Drawbaugh as partners in the manufacture of this new improvement in molasses faucets, then untried and unpatented; but before doing that they thought of telephones. Will your Honor turn to the brief, pp. 230–31? I will read from the top of p. 231.

They actually went into the faucet business about December, 1878.

Mr. Chellis testified on this point, and his testimony will be found in defendants' proofs, Vol. I. p. 548. Mr. Moffitt testifies (defts, i, 519): —

" *Q.* 24. Why did you finally decide to go into the faucet rather than the talking machine?

" *A.* Because I understood the faucet business better than the talking machine, and having asked Mr. Chellis what he thought of the talking machine as a speculative enterprise, he discouraged it and encouraged the faucet business, because, as he stated, there was more prospect of making money out of it, the faucet, in a short time, than out of the talking machine."

" *X Q.* 28. How long before you went into the faucet business did you have a conversation with Mr. Chellis about the relative merits of the talking machine and faucet?

" *A.* As near as I can remember, a month or two.

" *X Q.* 29. Your conversation must have been somewhere in the fall of 1878, I suppose?

" *A.* I think so.

" *X Q.* 30. Did he tell you why he thought there was more prospect, etc., as you have stated?

" *A.* Yes, sir. I remember that one of the leading points stated was that the telephone was already in use, and that Dan would have a hard time to establish his claim on it, and that there would be more money in the faucet than in the telephone business; his meaning was that Drawbaugh would have to establish priority of invention, etc."

Mr. Chellis says that Drawbaugh urged him to go in with him on the telephone, but that he did not. I read from defts, i, 548: —

" *A.* 12. Because I was interested in the faucet and motor business and wished to push them, and I did not think we could do much with the telephone, as Bell had a patent, and I didn't know that he could antedate them.

" *Q.* 13. During any of your early conversations with Mr. Drawbaugh on the subject, did you say anything to him about Bell's patent and claim of priority over all others?

" *A.* Yes, sir; and I advised him to drop it, the telephone, as he could not antedate Bell; he said he did not know about that; that he had been working on it a good while; it was his way of expressing himself; when I would say, You cannot antedate Bell, he would say, I don't know about that; I have been working at it a good while."

Reis might have said that. "It was his way of expressing himself," he was heard to say it more than once apparently. "It was his way of expressing himself; and when I would say, You cannot antedate Bell, he would say, I don't know about that." Does your Honor know better than he did?

Dr. Moffitt knew, Mr. Chellis knew, that he could not antedate Bell; and having had that conversation, those were the words that were addressed to Drawbaugh, "You cannot antedate Bell"; and Drawbaugh's reply was, "*I don't know about that;* I have been working at it a good while." This is what you learn from the testimony of Grissinger, who said that Drawbaugh told him also in 1878, that he tried it years ago, but never did it.

Now, I come to the next thing. That attempt to get a patent on that improvement in molasses faucets, in the year 1879, resulted in an interference contest between Drawbaugh and David Hauck, a mechanic in the neighborhood, who alleged that he was the first to make that invention. In that interference contest Mr. Jacobs, one of the three gentlemen who produced Drawbaugh to the world, was counsel for Drawbaugh and his partner Chellis and his partner Dr. Moffitt. Mr. Hill subsequently became counsel for them after the evidence was closed. Mr. Hauck, the other contestant, was a man who, with his brothers, had in July, 1873, bought out Drawbaugh's faucet patents. Drawbaugh had made two improvements in faucets, one in 1867, and had been manufacturing them in his shop for a while. In the summer of 1873, David Hauck and his cousin, of the firm of Hauck Bros. & Co., bought that patent and went on with the business and carried on there the manufacturing business for one or two years, more or less, in that shop. David Hauck worked there personally alongside of Drawbaugh, on the same floor, and in the same room most of the time. All that Drawbaugh had, he knew. It was impossible that he could have had a talking machine without Mr. Hauck knowing all about it. Mr. Hauck was an ingenious mechanic, — quite an intelligent man, — a man of some education apparently, if you may judge from the language of his deposition, and it is a fact proved by Drawbaugh himself that he was very intimate with Hauck, — very free in showing him his inventions. Indeed the evidence is that he showed him at one time this magneto key, which was intended to be an improvement on the telegraph key, and Hauck got him a chance to have the telegraph operator try it. The testimony of David Hauck in that faucet interference was taken in May or June, 1879, and Drawbaugh and his counsel thought it would be a good thing and it would enhance his standing as an inventor if they could make the Court believe that he was a man of great genius for inventions. So they opened the cross-examination of David Hauck, which was conducted by Drawbaugh and his counsel, Mr. Jacobs, first by proving that David Hauck was a frequenter of the shop of Daniel Drawbaugh, and that he knew all about Daniel Drawbaugh's inventions; that Daniel Drawbaugh was very free in communicating with him. And then they went on with a great mass of testimony, of which I will read a few words only. It will be found in complts, iv, 251 *et seq.*

Drawbaugh showed that both the Haucks certainly knew of all his inventions; each question is Drawbaugh's own assertion. They examined Samuel F. Hauck, as follows (complts, iv, 242): —

"*X Q.* 19. You and David A. Hauck frequently went to Drawbaugh's shop, and talked with him on the subject of machinery and of his inventions, did you not?
"*Ans.* We were frequently there together, but did not go there together; and talked with Drawbaugh about machinery and his inventions.
"X *Q.* 20. He was very free and accommodating in giving ideas and hints on those subjects to friends who asked him?
"*Ans.* Yes, sir; he was.
"*X Q.* 21. And David A. Hauck and the members of your firm were always on friendly terms with him, up to the time of this controversy?
"*Ans.* So far as I know, they were."

Then they examined David (complts, iv, 254): —

"X *Q.* 29. While he was perfecting his clock, he told you about his invention, and his experiments upon it, did he not?
"*Ans.* He did.
"X *Q.* 30. Once, or more than once, did he talk to you?
"*Ans.* He talked to me about it a great many times.
"*X Q.* 31. Did he ever talk to you about any of his other inventions?
"*Ans.* He did.
"*X Q.* 32. He was generally pretty free in communicating his ideas to his friends, wasn't he?
"*Ans.* He was."

So, plainly they knew everything.

Then they went to David Hauck on the issue they raised (complts, iv, 251): —

"*X Q.* 1. Mr. Hauck, you have been acquainted with Daniel Drawbaugh for a number of years, have you not?
"*A.* About ten years.
"*X Q.* His shop, which has been spoken of in this testimony, is situated at Eberly's Mills, in this county, a few miles from here?
"*A.* What he calls his shop is located at Eberly's Mills, this county.
"*X Q.* He is a machinist, is he not?
"*A.* That is one of the trades he is proficient in.
"X *Q.* Then he is a man of versatile talents, is he?
"*A.* He is.
"*X Q.* And a born inventor, is he not?
"*A.* That I cannot say, as I have only known him for about ten years.
"X *Q.* You are aware, however, that he has made a great many useful and ingenious inventions, are you not?
"*A.* What he has made since I have become acquainted with him, that I have any knowledge of, I would call imitations, although some of them might be patentable."

Then he went on to name as among such inventions the blower, the boiler feeder, the magnetic clock, the steam pump, the hydraulic ram; and said, " That is all that I can think of at present."

"*Q.* Mr. Drawbaugh has also invented a measuring faucet, did he not?
"*A.* He did."

May it please your Honor, they were trying to have David Hauck admit that this man was a great inventor. If there is a word of truth in their story, there is not a man in the universe who knew better than David Hauck whether Daniel Drawbaugh had telephones there or not in 1873, 1874, 1875. Think of it. They ask him the questions in order to show that he knew all that Drawbaugh had done. "Was he not in the habit of communicating his inventions to you? Were not you and your brother and Daniel Drawbaugh quite intimate?" They put these questions to him, and *he did not know anything about telephones.* That was not all. Then after he had asserted that Mr. Drawbaugh was an imitator and improver on other men's ideas and not an originator, they went on to question him: "Did he not invent this?" "Did he not invent that." And so *they* go on through two or three pages, putting to him questions of that kind, but *never once saying telephone.* They questioned him about clocks, faucets, blower and nail machines. Drawbaugh filled the record with suggestions, but *they never said telephone.* They wound up as follows: —

> "X Q. 52. And you undertake to swear that Daniel Drawbaugh is an imitator, and not an original inventor?
>
> "*Ans.* I believe him to be an excellent imitator, while I do not say that he could not be called an inventor."

And there they stopped. There are three or four printed pages of that. There it is; that record don't lie. *And they never said telephone once.*

We pointed out these facts and drew those conclusions on the record (complts, i, 836–8), and the defendants have not even attempted to meet them.

But that is not all; they had introduced this issue whether he was a great inventor. They had thought over it beforehand, and that is the evidence they offered to sustain it; no telephone mentioned.

Go a little further, may it please your Honor, and turn to page 118 of the same volume. After they had finished David Hauck's examination, the claimant's brother, H. F. Drawbaugh, went on the witness stand, and it appears from his testimony that he was in the habit of going to Drawbaugh's shop once a week for years and years; he has now gone on the witness stand and sworn that he saw talking machines there in 1872, that he was there constantly for several years after that, and down to the time when the suit began; that he never went there without seeing Daniel Drawbaugh working on these machines, and that they were perfect and practical machines; and not only that he saw Daniel Drawbaugh working on these machines every time he went there, but that he himself spent hours and hours himself in experimenting with them. That is what he *now* says he did. What did he say in 1879? Drawbaugh and his counsel having raised that issue, and that issue having been put into that case, as to whether he was a great inventor or not, Hauck and his counsel asked the witness, Henry Drawbaugh, this question: "Is not your brother, Daniel, a boaster?" He answered, "Oh, no; not at all." I am reading from complts, iv, 121, cross-examination, middle of the page. They asked him, "Is not your brother Daniel a boaster?" and he replied: —

"As regards the bragging, I say no; he is no braggadocio. And further, I never saw him make a machine that did not work. And as regards the faucet paying, he said it was a good thing, and would pay, and I was satisfied of that myself."

Think of the inventor of the speaking telephone, who had not a patent on it, who could not find means to get a patent on it, spending a whole year litigating on a faucet, and that only an improved kind of faucet!

But I will read further.

"*Q.* Please enumerate the machines that you have seen him make of his invention, that worked satisfactorily."

The COURT. When was this testimony given?

Mr. STORROW. In June, 1879. I have stated these things in order. It was after all these various publications, etc. The counsel for Drawbaugh in this case was Mr. Jacobs, one of the three gentlemen who produced him to your Honor; and one of his backers was Mr. Chellis. The witness, Henry Drawbaugh, answered: —

"*A.* Stave joiner, two stave cutters, two heading cutters, a shingle cutter, a harvester, a heading rounder, a nail feeder, a felloe saw, an electrical clock, a rotary pump, two faucets, a water engine, and a great many more, and not one of them but what would work; and the man had not the money to go into them and push them. That was what was the matter."

But he had the money. He did push the electric clocks. He found partners to put in money to go into that. Then he had partners to carry on the lawsuit about the faucet. He had other partners of whom I shall speak by and by who put $20,000 into the first faucet business. He could get money to go into that business; yet the telephone must wait.

I will go to another deposition, at p. 142 of the same volume (complts, iv). By and by Daniel Drawbaugh went on the stand; and Mr. Hauck and his counsel not being aware that he was the inventor of telephones, put to him a conundrum, and began by asking this question (complts, iv, 142): —

"*Q.* Since 1866 what machines have you conceived and perfected that have worked satisfactorily?

"*A.* To the best of my knowledge, I think that they all have. The nail machine gave satisfaction. I had it running in the works, but the nailers drove me out. The tram and red staff was a good machine, and adopted by a number of millers, and acknowledged by them to be a good machine. The magnetic clock I consider a good thing, but I am not through with experiments on it. I believe this last faucet is a good thing."

Where is the telephone mentioned? He does not say that he has invented that, and that he considers it a good thing.

We put David Hauck and Samuel Hauck and their workmen on the witness stand, and of course they testified they never heard anything about the telephone, and did not know anything about it. When Drawbaugh was under cross-examination we handed him this deposition, and asked him to read it. The question is (defts, ii, 1065): —

"*X Q.* 1480. Will you look at your own testimony in that record and say whether or not, according to your best recollection, the statements therein made by you were correct, and whether or not you wish to modify or explain any of them?

"[*Objected to by Mr. Hill as incompetent, irrelevant and immaterial,*" — the man's own sworn statement, — "*and as new matter not called out by the examination in chief,*" — I should suppose it would not have been called out in chief, — "*and as a matter not between parties to this suit.*"]

"*A.* I think the answers there made were correct, to the best of my recollection at the time. I don't know that there is anything there that I could wish to modify; I could look over it, but it would take a good while to look over it."

Then he was asked to look over it, but said he would prefer to take it away and look over it at home. Then he came in the next day, and the question at the top of page 1070 and bottom of page 1069 was put to him: —

"*Q.* Have you examined farther your deposition in the interference case to which your attention was called yesterday?"

He replied that he did not read it all; that when he got home that evening the neighbors had gathered for a prayer meeting, and requested him to be present, and could not decline, and so had not had time to read all of the deposition. He was then asked to complete the reading of it, and to answer the question, and after reading it he said: —

"I do not find anything there to modify. It was given to the best of my recollection at that time."

For this, see brief, 224–7.

Now let us put together in a series the facts I have mentioned.

Some time after June, 1874, he published that card which contains a list of his inventions. I want to read to your Honor the testimony about that (complts, ii, 1212). Holsinger was his most intimate friend, as I have explained (p. 96, *supra*); he lived next to Drawbaugh three years, and says he experimented with Drawbaugh more than did anybody else; and that the telephone was substantially all the invention that he ever knew of. He printed this card, and we recalled him simply to prove the card he had printed, and some newspaper articles that he had written.

" *Q*. 9. Please look at the advertising card which I now show you, and state whether you printed it while you lived at Eberly's Mills.

" *A*. Yes, sir.

" [*Objected to as immaterial.*]

" *Q*. 10. State, as near as you can recollect, how many of them you printed.

" [*Same objection.*]

" *A*. I printed one hundred and fifty the first time, and think I printed a second lot of one hundred and fifty; I am not positive as to the second lot.

" *Q*. 11. Did you deliver them to Mr. Daniel Drawbaugh, and did he pay you for them?

" [*Same objection.*]

" *A*. Yes, sir; I think he came to the office and got them; the understanding as regards paying for them was in consideration of the five dollars that Drawbaugh had given me.

" *Q*. 12. Was the first lot of them printed after he had given you the five dollars?

" [*Same objection.*]

" *A*. It would seem so from the fact that the type which I got with the money given me by Rupp and Drawbaugh is used on the card, which I did not have before I received that money; the card is printed on both sides and is as follows."

Then follows the card, already printed pp. 53–4, *supra*.

Drawbaugh had loaned him five dollars to buy the type with.

Although the witness was not positive as to whether a second edition of this card was printed, yet, inasmuch as he was not cross-examined on that subject, and as Mr. Drawbaugh didn't come on the witness stand to contradict his testimony, I think it must be taken as fairly proved that there were two editions. Your Honor will search in vain for any reason why the telephone was not mentioned in that list. Drawbaugh knew of it and Holsinger knew of it; and yet there is not a word, with reference to the telephone, printed on this card.

The next thing was the article by Holsinger in the fall of 1875, about the electric clock as a great invention. Then all the statements made in the spring of 1878. Then there was the visit to the telephone office, and no pretence made that he had invented the telephone. Then the biography. Then the adjudication by these parties, *suo judice*, in the case of Chellis and Moffitt. *Chellis now wants this Court to reverse that decision and on Moffitt's evidence.* Then this interference matter.

I have now stated Mr. Drawbaugh's history, or so much of it as is necessary for me at the present moment to go over, beginning with the year 1877. I want to go back and state to your Honor the history of that man before that time. I want to state if I can the main events of his life, his means, his resources and his surroundings from the time when he says he made this invention, until the time when he heard that Mr. Bell was famous as the inventor of the speaking telephone.

He was, as your Honor knows, a professional inventor and patentee. On p. 236 of our brief is a list of his patents, a dozen or more of them, from 1851 down to 1877. Their story is that he invented the telephone (I speak of that as distinguished from the perfected commercial instrument) in 1863 and 1864. He says that he talked through it with a daughter born in 1857, when she was about six or seven years old. One witness was produced who said that Daniel Drawbaugh showed him, in 1864, a drawing, or sketch (which shows nothing at all), and told him that he was *then making* a machine. Another witness says that Daniel Drawbaugh told him in 1865 that he *had talked* through it successfully. Now I want to show what his life was from that time, because the testimony is uniform from all their witnesses that this absorbed his whole thoughts from the time he first struck it, whenever that was (brief, pp. 236 *et seq.*).

On page 80 of the brief we have collected a considerable number of quotations, from something over forty of the defendants' witnesses, in which they say Drawbaugh told them he had a machine of the greatest value.

One witness said, "Well, he said a good bit about it. Yes, sir; he said it was the greatest invention ever was known."

Another witness said, "He said he could run it out for miles, and parties could talk in at the one end, and be heard at the other end, the same as persons in a room together." "He said it would eventually take the place of telegraphs." "He told me that he had n't the means, but that as soon as he ever got the means he was going to have it patented."

Another witness says that Drawbaugh said, "Uncle Dan, I am working at something now; if I can accomplish it, it will be worth thousands to me. He said if he had some person to help him they could make a nice thing of it very soon. He asked his best friends, he said, and they all refused him."

Another witness says, "He said, 'I have invented a great many machines, such as telegraph.' Then he showed me that he could telegraph by writing on a silver paper, tin paper, and put that to the wire, and it would write the same at the other end. Then he said, 'I have a talking machine that beats all the other of my inventions.' Then he showed me some fixings for talking in; I said, 'Daniel, this is wonderful.'" But they did not talk through it.

Other witnesses said that he said that it was a great thing, and he would make a great deal of money out of it. His neighbors had the same view about it, that if he could make a talking machine, — not that he had made one, but if he could make one, — there would be a good deal of money in it. "One of the men made this remark: Look at Daniel Drawbaugh: personally, you would not think there was more in him than a block of wood; and the idea of a man like him to try to invent a talking machine." One of the others remarked; "If he is successful in getting it finished, he will be the richest man in the valley."

That was the talk: "If he can succeed in getting it finished, he will be the richest man in the valley."

Again on page 84 (these quotations cover a number of pages), we have collected a number of passages as to what the rumor or story in the community was. The defendants have introduced witness after witness to say that they had heard Daniel Drawbaugh's machine spoken of generally. Generally it is put to them in the form of a leading question: "Did you hear Daniel Drawbaugh's talking machine spoken of?" and the witness says, "Yes." Now, you might have said as much as that about Reis. That merely shows, or at most tends to show, that he was trying to make one. Every now and then we get out from the evidence some real indication. Here is one; I take that of Jere Fry: he says that Drawbaugh did not talk, but sang through them; and, after that, "I talked with several persons that it is a very good thing if he gets it accomplished." That was as late as 1875.

Another man says: "I urged him to get it patented; he said that he had not it completed or in shape to get it patented, — that he wanted to make some improvements on it." This was 1874. "Afterwards we spoke about getting it patented, and his plea was poverty." "I know he pleaded poverty several times that I spoke to him about it after that first conversation, when he said that he did not have it in shape yet."

Another man, the cobbler of the village, says that in the fall of 1872, when a number of them were together, "I heard Emanuel Dietz make a remark in my shop about Daniel Drawbaugh and his talking machine. Daniel Drawbaugh was going along with his hands in his pocket, with his head bowed down, and Dietz said, 'Here comes Dan Drawbaugh, the damned fool, he will go crazy trying to make a machine to talk to people away off.'"

That was a remark which the defendants say was addressed by one of the villagers to another villager in the village exchange, the cobbler's shop, and the witness represents that all recognized it as true. It was not that Drawbaugh, in 1872, had had, for five years, a talking machine which talked perfectly well; but that he was then so far from success that failure was driving him crazy (defts, iii, 369): —

"*Q.* 17. You say that Mr. Drawbaugh was coming along in a stooping position at the time, and you illustrated it by rising in your chair and bowing your head down as if in deep thought; does that describe the appearance of Mr. Drawbaugh at the time?

"*A.* Yes, sir."

Ridiculous as this is, they want your Honor to believe that he had completed it five years before that, and had a completed talking machine; and yet here he was, with head bowed down, engaged in thought, trying to invent a telephone; and the remark is made that "he will go crazy *trying* to make a machine to talk to people away off."

By conversations of that sort you are able to get a little insight into what the villagers thought of him. There is a lot more of the same sort. It appeared afterwards, by their cross-examination of one of our witnesses, that Dietz was frequently in that shop, had lived for twenty years in that village, and lives there now; and yet the defendants did not call him. They put in, against our objection to it as hearsay, the cobbler's verson of what Dietz said, twelve years before he testified; and yet there was Dietz himself, living for years right alongside of Drawbaugh, still living there; and yet they did not call him (brief, pp. 291, 293, 310; app. 466). But I do not want to complain of that particular piece of testimony.

They say that Drawbaugh made this invention and made his first instrument in 1864 or thereabouts. If you believe his story, he talked with his daughter in 1863 or 1864. That daughter is not living. About that time he made an improvement in nail machinery, an attachment to a nail machine to feed nail plates; he found no trouble in getting partners and money both. He got three partners who put in money, paid for his time and had the invention patented. They paid for his time in experimenting, and for making a machine and for materials and for the expense of putting it up; a patent was taken out in December, 1865, and another in November, 1867. These three gentlemen put in a number of hundred dollars each. Mr. Drawbaugh did not know exactly, but as far as one can judge from his testimony, how much, they must have put in from one to three thousand dollars. Is that the case of a man who could not get assistance? *One of these three partners was Governor Geary of Pennsylvania.* Could there be a man better able than he to give publicity to the invention of a speaking telephone? It was just after the war. Governor Geary was then the foremost man in the State. Another partner was Governor Geary's brother-in-law and private secretary, Mr. B. Frank Lee. That business continued until

1872 or 1873. Just think of it! Living three miles from the capital, he had, for a partner, Governor Geary for five years, with a perfect speaking telephone in his possession, and nothing ever came of it. Try to believe that. Mr. Lee died in 1877. Mr. Eberly, the other partner, is living, and his deposition has been taken by the defendants; and in that deposition he says he never talked through one, but he thinks that Drawbaugh showed him one, and said to him if he wanted to go in, Mr Drawbaugh would take him in as a partner, but he never tried the telephone. That is all that Mr. Eberly knows about it. It appears from Mr. Eberly's deposition that he is a man stricken in years and broken in mind, and his testimony was so ludicrous about things which he swore to as positively as he swore to this, that it cannot have any weight. He swore that in 1867 he saw the flat instrument A, which, as a matter of fact, the defendants allege was not made until 1874. He is that kind of a witness. For the nail-machine enterprise see brief, pp. 239–243.

Next he invented an improvement in molasses faucets. One day the village storekeeper found fault with his molasses faucet, and said that it would not operate in cold weather. Mr. Drawbaugh said that he thought he could make something that would remedy the trouble. He made a wooden model, brought it to the storekeeper in a day or two, and asked him if he would like to put money in and get out a patent, and carry on the business of manufacturing them for half an interest. That was done; and Daniel Drawbaugh afterwards sold for $1,000 his remaining half interest, and got a good indorsed note for it; that was in 1867.

It turned out that the invention involved in the faucet (which was a rotary faucet, — you turned a crank, and it measured off the molasses something as a gas meter does) could be used as a pump for pumping water instead of molasses. Drawbaugh, having sold to these two persons the right to use that invention for a faucet, he proceeded to get up a company to buy of him the right to use the invention in a pump. He got up a pump company among his neighbors. The company was formed of six persons, and it began by raising and paying him $6,000 for the right to use that part of that invention. Daniel Drawbaugh received $5,000 of it in money, and $1,000 in one sixth share of the stock, one sixth of the property.

They did not pay him all in cash at the moment; they paid part in cash and part in notes, which ran along for about two years; but they were all paid in full. That was not all; they next proceeded to fit up a workshop; and, in order that I may be accurate about that, I will read from a deposition, which will be found in the brief at page 243. It is the deposition of John Drawbaugh, Daniel Drawbaugh's brother, who describes it. This company was known by several names at different times. It was sometimes called the Faucet Company, sometimes the Pump Company, and sometimes the Drawbaugh Manufacturing Company; but it was substantially the same concern, under different names. It was substantially and practically one concern, one enterprise. The whole matter of this enterprise is spread in the brief, p. 243. I will read from John B. Drawbaugh's deposition (defts, i, 616; brief, p. 243): —

> "*X Q.* 121. The Drawbaugh Manufacturing Company was the company composed of Gorgas and others who made your brother's patent faucets; was it not?
>
> "*A.* Yes.
>
> "*X Q.* 122. It was the same concern that was sometimes known as the Pump Company; was it not?
>
> "*A.* I guess that will want a little explanation to show the difference. In the commencement, the Pump Company and the Faucet Company were two different companies. After the invention of the faucet was completed, Daniel discovered that he was not able, for want of funds, to bring the faucet into the market. He sold the right of the faucet to a company by the name of Gardner & Crull for $1,000, for which he took Mr. Gardner's paper, with Jacob Croover's name as security. Then Daniel turned the faucet into a pump, or rather made a pump on the same principle as the faucet. On that they formed a company in the name of Mr. Gorgas, Musser, Hursh and others. They were to pay him a consideration of $6,000 as I heard. That company established a machine shop at Eberly's Mills, which some of the company told me cost them from $20,000 to $25,000. After manufacturing the pump for about one year they found the pump to be a failure. The company then purchased the Drawbaugh rotary molasses faucet from Mr. Gardner and others; the price they paid for it I do not know."

Mr. Drawbaugh was examined about that. Mr. Gorgas was one of the partners and bookkeeper of the firm, and was called by the defendants. The details they give are a little different from those stated by John Drawbaugh, but not materially. Mr. Gorgas testified (defts, i, 677; brief, p. 247):—

> "*Q.* 7. Up to what time did that company continue to manufacture and sell faucets and pumps?
>
> "*A.* I think up to the time of the sale to Hauck Brothers & Co."

Which was in July, 1873, six years after the company was formed, when the stock, good-will and everything was sold out to a new concern. I do not think they continued the business all that time very actively, but they were carrying on some business up to that time. Mr. Gorgas says they were carrying on some business up to that time. This shows that he had around him, therefore, during those six years, from six to nine partners at different times. They were men of means. One of them was worth $90,000; another was worth $40,000; another was worth $30,000; and another $20,000 or $30,000; and another is described as "well fixed." They were his immediate neighbors, farmers who lived in that wonderfully rich country, the Cumberland Valley. These were people who had lived within a stone's throw of him; and who, on the faith of his inventions, raised that money and paid it to him, and fitted up a shop. The concern went on; but apparently the demand for faucets was not enough to occupy their works and their capital; so in the spring of 1869 they proceeded to turn their attention to the manufacture of something else; and the first thing they did was to ask Daniel Drawbaugh (who was their master mechanic, their draughtsman and designer of machinery, for they did a general jobbing business as well as the particular business of manufacturing faucets) to furnish them with some other invention of his own, to occupy their $20,000 of capital and their machinery. He suggested that they make a stamp canceller, and a machine for making carpet tacks, and some other contrivances which he had formerly devised. There did not seem to be much money in those, and they did not take them. Finally, it was suggested that they should make a gas governor which he had invented; a contrivance to be attached to the private pipes of consumers, to regulate the flow of gas. It was an old contrivance, but I presume that he had made one of a somewhat different shape, or somewhat different in detail. He went to work and made a new gas governor to exhibit. Let me read from the records of the company what is stated as to them, — I refer to our brief, p. 250: —

"Jan. 29, 1869. Daniel Drawbaugh agreed to give his gas governor that he is now preparing to secure a patent for, to the company, for the company's use and benefit, the conditions to be agreed upon hereafter."

Daniel Drawbaugh testified (defts, ii, 1001; brief, p. 250): —

"I made the second gas governor more complete in order to show it to the Drawbaugh Pump Company for the purpose of illustrating it to them, for the purpose of getting them to take an interest in it. There were some inquiries made about the machine, and it was found that the gas companies would not allow it to be attached to the meter. I guess for that reason there was nothing done. They did not take an interest in it."

Not because they did not believe in him as an inventor, but because the gas company would not let them use it. They went so far as to have the thing tried in the shop. He fitted up a retort in the forge, put up a line of piping in the shop, put in the gas governor, and fired the gas retort. It leaked and destroyed the exhibition, and nothing more was heard of it. Not a word about the telephone. His whole company assembled at his shop to examine his inventions, in order to find something to put their money into; all there in his shop where, if his story be true, he had had telephones for two years: but no exhibition of them, no mention of them. That was in the spring of 1869. But they did not lose faith in him then. The next thing on the records are the minutes of a meeting held March 26, 1869, where you will find the following (brief, p. 251): —

"On motion of Henry S. Rupp and Daniel Drawbaugh, it was agreed that Daniel Drawbaugh shall, as speedily as possible, not to interfere with other necessary work, get up and make a screw machine for the use of the shop and for its benefit."

They had exhausted his list of inventions, and this company, with a machine shop and $20,000 of capital, now they wanted him to invent something new. Mr. Dorsheimer, from Buffalo, a relative of Mr. Gorgas, came there, and he told some of the members of the company that there was money to be made in manufacturing screws.

He said that it was a paying business; and Mr. Drawbaugh said he could easily invent a machine or get a machine that would manufacture screws. But what he did never came to anything.

In 1870 this concern reorganized. They had been a partnership up to that time, and they then reorganized as a corporation under the laws of the State of Pennsylvania, with a capital of $20,000, which was less than they had actually paid in. They called themselves the "Drawbaugh Manufacturing Company"; they named it after him, and formally elected him "Master Mechanic and Draughtsman." They got up a bill-head and an advertisement of what they manufactured, including a list of half a dozen of his inventions.

Now, may it please your Honor, there was that organization (which had raised $25,000 on the faith of his inventions), which had been going for six years, and was now seeking for something more of his to make; seeking some new invention of his; making some of his things and asking for more; he offered them one thing and another, and another, *yet never so much as mentioned a telephone to them during the whole of that time.* What is the use of saying that he never patented or used the telephone because he could interest no one? He never even asked them to put money into it; he never even mentioned it to them! What is the use of saying he had a practical speaking telephone, and that all he wanted was to get some one to put money into it, and to get $75 to patent it, and could not? *He never said one word about it* when he was there offering all these other things to his company. See p. 147, *infra.*

That is not all. On p. 245 of the brief we have a list of the partners, and a pretty fair list of the workmen. There were nine partners, and there were from time to time as many as eight workmen at one time.

We have got the names of sixteen, seventeen or eighteen who, at different times, worked for that company. Over six years this extended, with a shop full of telephones, and everybody knew it, so they say. Nobody could go there without seeing them, they want you to believe. One of their witnesses, George Hosler, the cobbler, testifying about the year 1872, says that a man must have been a deaf man in that village not to know about it, because even the children were talking about it. During those six years he was one of a firm of nine men, appreciating him, naming their company after him in the third year of its existence, with from fifteen to twenty workmen in their employ, and *not one of these twenty-five men ever talked through the telephone or ever was talked to through the telephone, or ever saw the telephone in a condition to be talked through;* yet with the exception of what is pretended by possibly two or three doubtful and discredited witnesses, it is not pretended that one of these men even so much as heard of a telephone during that time. It is certain that they did not. That is a pretty strong statement; but that is what the proof is; the uncontradicted proof, — the proof drawn from the defendants' own record. What is the use, if that turns out to be so, if these parties were there, ready to put money in his inventions, and were asking for more of his inventions, — and we have the positive testimony of partners and workmen who worked alongside of him that they knew nothing about it, — what is the use of bringing in those who only occasionally were there, farmers and idlers who loafed in there at times, to say that they knew all about these things?

At page 245 of the brief you have a list of the partners, — nine of them. *William L. Gorgas* was the bookkeeper, superintendent and time keeper, daily engaged at that shop for a considerable length of time, not for the whole six years, but during 1867, 1868, 1869. The *defendants* called him, and had him testify about some money transactions between Daniel Drawbaugh and the company, but *did not once ask him about telephones.* They called man after man, and man after man, from fifty miles away, to say that they had heard somebody say, that they had heard somebody say that they had heard that Drawbaugh had a talking machine. They put on the witness stand the claimant's partner, the foreman and timekeeper of the company, now the teller and bookkeeper in a bank in Harrisburg, yet they did not ask him one word about that.

Then they put on the witness stand *Samuel F. Hertzler*, a twenty-year-old friend of Drawbaugh, a farmer who lived close to the village, only one field distant from Drawbaugh's house, a man worth $40,000, a wine grower, — makes and sells wine, — who naturally would have known all that was going on. They put him on the stand to prove that Drawbaugh once came to him to borrow five dollars, and that he was very slow in paying it; that Drawbaugh bought provisions from him; that Drawbaugh's children would come and buy provisions and would sometimes not have the money to pay for them, but would say, "Pa would fix it," and they always got the provisions just the same. They put that man on the stand, *yet did not say telephone to him.* They are the parties who have got the burden of making out a case. He is a responsible man, a man of means in that place, but there is not a word said to him about the telephone.

They then put *Mr. William R. Gorgas* on the stand, a man who lived near the village, a mile and a quarter from Drawbaugh, who has known him for many years, and was a partner; who was worth $90,000; and they asked him whether Mr. Drawbaugh ever applied to him for any money. He answered that he had, at one time, after the Faucet Company wound up, between the summer of 1873 and the fall of 1877, at which latter date Gorgas moved over to Harrisburg; that Drawbaugh once said to him at the shop, "I have got an invention that I want you to put some money in." He said that he did not care to do it. That is all. There was no pretence that it was the telephone. Why, the shop was full of contrivances that he wanted men to put money into. There was no pretence that anything was said to this man about the telephone, and not even a suggestion that there was a telephone there. Not only that, but Drawbaugh was asked in his own deposition whom he had applied to put money in, and he named two or three, but did not say that he had ever asked Mr. Gorgas for money for his telephone. So Gorgas was a man to whom he did go for aid about other inventions, but not about telephones, and there is not a pretence nor an intimation that he ever saw one or even heard of one. See for Gorgas also p. 147, *infra*.

Then we called *Mr. H. S. Rupp*, a florist, a man of wealth, the largest greenhouse man in the county, a man of high standing in that community, who has known Drawbaugh for a long time, and he said that Drawbaugh had been to him a number of times about various things, and had shown him his inventions and had talked with him; yet Mr. Rupp had never heard of the existence of a telephone or of anything like it in Drawbaugh's shop until he went there once in 1877, after he had seen speaking telephones elsewhere; and he then listened at that instrument, the tin can, and heard a sound, but could not make out what the sound was. That was in 1877. For H. S. Rupp, see brief, pp. 248–250; app. 435.

Then we called *Mr. John F. Hursh*, another partner, and he said the same thing; that he had heard of it first in 1877 or 1878. Hursh was a man worth $30,000, and was living between two and three miles from Mr. Drawbaugh. There is no escape from that testimony. For Hursh, see brief, p. 248; app. 443.

Now, look at the workmen. We called first of the workmen on that list, *Jacob Carns*. He worked three years for that Faucet Company, from 1867 to 1870; and he boarded for six months of that time in Mr. Drawbaugh's house, and taught music to his daughter; he was the musician of the place and played the organ in the church; but he never heard of the telephone. He was the young man of the establisment, and was just the one who would have been called in when experimenting was going on, and he was called in when there were experiments about other things; but he never heard a word of a talking machine (brief, p. 249; app. 248).

I will not go through with this list of workmen. Curiously enough, the defendants called three or four of those workmen, but they never told the Court that they were men who worked for the Faucet Company (brief, p. 248).

They called *John C. Smith*, who was born and brought up in that village, and whose father lived there at 1878; and he testified that in 1872 and 1873 he was running as a fireman on a locomotive engine; and that on off days and on Sundays he used to go home to see his father, and would spend most of his time in Drawbaugh's shop and, "as near as he could remember," used to experiment a great deal. He is not quite sure about it; but the inference intended is that he spent almost every Sunday experimenting on the talking machine, — with that tin can and tumbler. That is all the knowledge that he pretends to have. The inference you get from the deposition is that that was about the only time when he was much at the shop, and therefore that must have been the time that he saw it, for he was not much there afterwards. Now that fellow worked three years for the Faucet Company, — 1868–70; and he does not pretend to any knowledge of the telephone before 1872. But that is not all. It turns out afterwards, that this man Smith worked at the shop in

1877, was building a portable steam engine there, and was working there for himself, off and on, for about a year in 1877. There was not a word of inquiry about that; we proved it afterwards by Drawbaugh's cross examination. For Smith, see brief, p. 248; app. 91.

If that is true, it cuts off five years of their history. If we were to sift the testimony of these witnesses, one half of it would go to prove affirmatively that telephones were *first* there after 1876; this man cannot be in the least relied upon to prove that they were there before that. His deposition is simply romancing. It is worthless as tending to fix the date. It does not appear from his deposition that he was there in 1877. This important fact to enable the Court to judge of him was not furnished to the Court. He must have clean forgotten that he worked there in 1877 a good part of the year. How many other witnesses are in like case? My brother on the other side would have done well if he had left out that deposition, for it gives us much insight. The witness must have forgotten that he worked there in 1877, a good part of the year. He has substantially no recollection of clocks which were very prominent there in 1877, yet we know from Drawbaugh and from a previous deposition of this man in the faucet case given in 1879, that he worked there in 1877. What is the good of a memory like that? Yet in intelligence and what passes for honesty, — the mere absence of a deliberate intent to lie, — he is as good as others.

There are a number of witnesses among the workmen who were called, who alleged that their first knowledge was obtained between 1873 and 1874, and so on; but they do not say that they were working with the Faucet Company. From some of them we find that out by cross-examination, and as to others we find it out otherwise.

Now, if it were one man only, we might suppose that he had forgotten it; possibly with two; but I think not. The defendants, searching high and low, and calling three hundred and sixty-six witnesses, *have not got a human being during these six years, among the forty partners and workmen, who pretends to have attempted to talk through this machine while connected with the shop, except two of the Drawbaugh family.* Let us see just what they have got. They have one man, E. B. Hoffman, a witness thoroughly discredited as a romancer of the worst kind, who testifies that he thinks that while he was there (and they got the date when he worked there incorrect; they have got it in the latter part of the year instead of the first part of the year, which, perhaps, is of no great consequence, although it is a circumstance that is to be taken into consideration with the rest of his testimony) once or twice he saw lying on the bench something like the mouthpiece of the tumbler instrument. That is all he knows. Three years after he left there he says that he talked through the tumbler and tin can, and heard speech perfectly well. That is as untrue as the rest. He is the bridge witness; for him see brief, pp. 254, 394, 532; app. pp. 134, 750.

This case has been going on for four years. In this last year of the case, and in surrebuttal, they called one John Schrader, who was a workman in the employ of the Drawbaugh Company for six months, and lived in Drawbaugh's house for two months, in March and April, 1869. All that he ventures to say is, that upon two or three occasions Drawbaugh took him into his private room and showed him something like a tin can, he thinks, and something like the cover of a tumbler, or a wooden cap piece, and said that those were for a talking machine; and he thinks that on several occasions Drawbaugh mentioned something of the kind at the table at his house. Now, if Drawbaugh had had a practical talking machine at that time, freely shown and known to all, as is now claimed, you could not have got one whose opportunities would have made him a much stronger witness to prove it than this man. His evidence, if accepted, disproves the story and all the facts essential to a defence during his time. For Schrader, see brief, p. 255; app. 658.

In complts, ii, 1147, appears the testimony of Mr. Henry S. Rupp, a very intelligent man, a man of affairs. He testified for complainants that, being a partner in this Faucet Company and tolerably familiar with Mr. Drawbaugh, Drawbaugh had a good deal to say to him about some other inventions, but that, curiously enough, he had never heard anything of this telephone before 1877. Thereupon the defendants put into his hands what purported to be an affidavit signed by one Dr. Musser, who was at one time a partner in this Drawbaugh Manufacturing Company. Dr. Musser was living at the time this controversy began, but died in 1881, before either side took testimony. But the defendants, before it was known that there would be a controversy, and before we had a chance to know anything about it, and afterwards, went around the country gathering up *ex-parte* affidavits. When it burst upon the world that there was to be a controversy, we found that they covered that neighborhood with *ex-parte* affidavits; and when we came to investigate the question afterwards, we saw the effect of that course in that community.

We then found that that entire community was committed *ex-parte*, upon such statements as could be got out of them, by men zealous for one side only, and employed in taking *ex-parte* affidavits. They were not entitled in any suit, and were sworn to before a justice of the peace. They could not have been used here; they have not been used anywhere. We have no information as to what they were to be used for; they were not produced in court. The effect was to forestall inquiry on our part, and to make whatever testimony has since been produced for the defence little better than *ex-parte*.

They had been to Dr. Musser on the 7th of December, 1880, and had taken from him an affidavit in which he says (complts, ii, 1146): —

> "Between the years 1867 and 1872 I frequently visited the shop of Daniel Drawbaugh, at Eberly's Mills. Some time during that period, Drawbaugh told me that he was at work on an instrument for transmitting vocal speech over a wire by means of electricity to a distance, and showed me an instrument which he had constructed for that purpose. He called it a talking machine. I have it now before me, and am able positively to identify it. This was somewhere between 1869 and 1872."
>
> He further states: "I have known Daniel Drawbaugh for twenty years. I am acquainted with his reputation for veracity and honesty," and everybody ought to believe him upon his oath.

Of course that is an incompetent and *ex-parte* affidavit. It is the affidavit of a man thrown into this case *ex-parte*, and is in every conceivable way foreign to the case. It is, however, of considerable value, as *he is the only one of these nine partners from whose lips those defendants have been able to extract a word about a talking machine;* and all that can be got from him *ex-parte*, and under such circumstances as I have stated, is that Daniel Drawbaugh had told him he had something to show him, and showed him something and said that it was a talking machine. He did not talk through it. Why? That is the most extraordinary thing in this case. There were from time to time intelligent men, and men of respectable education, who visited that shop; but they were not the men who talked through the talking machine. The defendants, in their record, have called three or four witnesses, of respectable education, who testified that they never talked through the talking machine, although they state that Daniel Drawbaugh showed them something and told them it was a talking machine; and they said, "Good morning," and went off. We find, most extraordinarily, that the most intelligent men, who think they were informed by Daniel Drawbaugh that he had a talking machine, never saw one. There are three grades of witnesses in the defendants' record. The better class, the substantial land-owners, neighbors, friends and partners, Gorgas, father and son, Hertzler, Ezra Gilbert, Leonard, John Heck, Jackson Free, knew nothing of a telephone before 1877. Then a lower grade think they heard of something or saw something; but you have to pick out the lowest grade for intelligence and education before you find one who will say he listened; or if there is here and there an exception, his dates are overturned.

Does Dr. Musser tell us what the machine was, which it is claimed Drawbaugh then showed him? What was it? Was it a string telephone? They do not identify it. Was it operated by electricity? What was the thing? They don't identify it. By and by they call the justice of the peace, who swore these *ex-parte* witnesses to their statements. He knew about the clocks and other things, but he did not know a word about the telephone, and he does not identify anything. Musser says, "It is now before me." We pointed out on the record that they did not identify it; they do not even supply this omission.

I submit that the attempt to thrust in a grossly incompetent paper, made under such circumstances, is an impropriety so great that it needs no comment. It is not as if it had been on the files of the court before the man was dead, for then we could conceive a certain propriety in it. But now it is produced to a court for the first time.

[*Intermission.*]

Mr. STORROW. May it please your Honor, if time were of no consequence, I should have liked to have read to your Honor some of the testimony of *Mr. Henry S. Rupp*, one of the partners in the faucet. The most material parts are printed in the brief (pp. 249–254), and I hope your Honor, before you get through with the case, will read it. But there is one incident that appears in the testimony of Mr. Rupp which is worth mentioning.

After we began taking testimony at Harrisburg in this case, in the spring of 1881, and while we were there, a meeting took place at the house of Mr. Gorgas, in Harrisburg. *Mr. W. R. Gorgas*, then living in Harrisburg, was one of the partners in this Faucet Company. The defendants brought there to that meeting a Mr. Hertzler, another partner, and Mr. Rupp, another partner, and the two counsel for the defence were also present. There they sat down to see what the members of the Faucet Company could do to help their friend and a neighbor in this case, for that is the amount of it. They discussed whether they could prove that he was a poor man, and whether, during the time of the Faucet Company and down to the summer of 1873, he was suffering from poverty. Without going into what is said about what took place at that meeting, let us see what they did as the result of it. They called Mr. Hertzler to prove that in 1879 he loaned Drawbaugh five dollars, and that at times before that when his children came to buy provisions, sometimes they would pay for them, and sometimes they would say, "Pa would fix it." They called Mr. W. R. Gorgas to show that at some time or other, between 1873 and 1877, Drawbaugh asked him to advance him some money about some invention, but with no pretence, direct or indirect, that it was for a telephone. They did not mention a telepone in his whole deposition. Indeed, Drawbaugh, being asked whom he applied to for aid about telephones, does not name Gorgas. See dep. of W. R. Gorgas, defts, iii, 1128; dep. of Drawbaugh, brief, 360; defts, ii, 862, 936; and for the meeting, dep. of H. S. Rupp, complts, ii, 1140.

At the meeting there was no talk about machines, and not a word about telephones. Yet, if there were three men in the universe who would have been likely to have known of the talking machine, if it had existed, they were the men. Is there any doubt about the meaning of this fact?

The deposition of *Mr. William R. Gorgas* is peculiarly significant. There had been this meeting of the three prominent members of the Faucet Company and the two counsel for the defence at Mr. Gorgas's house. Drawbaugh had been asked whom he applied to for aid, and he did not mention the Faucet Company nor any member thereof. He had put on the stand the partners Hertzler and William L. Gorgas, and did not ask them about telephones; we had put on the stand two other partners, John F. Hursh and Henry S. Rupp, and by Henry S. Rupp proved specifically and generally in the broadest manner and with the boldest assertions that no such thing as the telephone was known to that company; and that if it had existed, all needed aid could readily have been obtained. There was no doubt about the controlling importance of that fact, which then stood as a fact, unless disproved. The defendants then worked one or two years more hunting for evidence, and called two hunded and thirty-eight witnesses; and finally, on almost the last page of their record and in the fourth year of the controversy, called William R. Gorgas, and by the tenor of his deposition conclusively established the fact, which already stood established unless contradicted, that no member of that company ever heard of telephones; but yet that Drawbaugh felt at liberty, even when that company had wound up and their money been divided, to apply to at least one member of it for assistance about some invention.

This Faucet Company gave up business entirely in July, 1873, and sold out to *Hauck Brothers & Co.*, who bought out the machinery and carried on the business in that shop with tolerable vigor for one year, and with less vigor for one or two years after that. I have already referred to the Haucks and the scene when the deposition of David Hauck was taken in the matter of the faucet interference (p. 126, *supra*). We put them and their workmen on the stand, but they knew nothing of the telephone. It was not possible that they should not have known of it, if it had existed. This is not a question of mere memory. *The faucet interference testimony is a conclusive statement by Drawbaugh that no such thing was there* (brief, pp. 225, 258).

The next concern was called the *Axle Company*, which has already been referred to. Four or five of Drawbaugh's neighbors started the manufacture of a patented axle, and employed him as a foreman to get up machinery and tools, and then to superintend the manufacture of axles for them at his shop. They paid for the machinery, and he had the free use of it for his own private purposes. That began in the spring of 1875, about February or March. There were four partners. In the spring of 1876 two of them went out, and in November, 1876 another went out and then a dissolution took place, and one (Capt. Moore) took the property and agreed to pay the debts and wind up the concern, which had not been successful. These dates are fixed by the papers which the defendants' witness produced. I am going to speak more particularly of this by and by; but I will say now that no member of that company (three of them have been put on the stand by the defendants, but the fourth has not been called, for reasons which we shall see pretty plainly by and by) — no member of that company ever talked through a telephone, or tried to talk through a telephone, or was asked to talk through one, or even ever shown one that was in a condition to be talked through. For the Axle Company, see brief, pp. 259–267, 501–511.

Now, what does this all mean? In the eight or nine years after this man was said to have invented the telephone, and before he heard of Mr. Bell, there were forty people, partners and fellow workmen, in that shop; his neighbors put over $30,000 in money into that shop on the faith of his inventions, and yet he says he could not raise $50 to procure a patent for a speaking telephone. The expense is only $15 for a caveat, $15 for an application, and $20 more when the patent is issued. During all these years, among all the witnesses whom the defendants called, there is not a man, who, while he had regular business at that shop, as partner or workman, ever attempted to talk through a machine, or ever saw a complete apparatus; with two or three attempted exceptions which rather prove the rule, none of them ever heard of such a thing. What is the meaning of that? Can one overstate its importance? Can one possibly be mistaken about it? It is true that many of them have not been called, but what is the meaning of that? Some of them have been called, enough to show the current and drift of what they know. It was the defendants' business to call them; it was the defendants' business first of all to show that his associates in the shop and in business knew about it. This is what the Supreme Court said in Brady's case; and that their ignorance of it was fatal to him. There are a number of cases in the brief (one of them I have before me, but I will not stop to read it) where the Court say that if there is a disputed question of fact, and the party upon whom the burden of proof lies does not call evidence tending to support his side, and does not call those whom the nature of the case would permit, and does not call all those whose positions give them the best opportunities for knowledge, the Court must assume, and may instruct the jury, that his failure to do that is a failure to procure what Judge Nelson called a more perfect exposition, and was conclusive that there was evidence which would justify the inference, that if produced it would have been adverse to them.

Mr. HILL. To what page of your brief do you refer?

Mr. STORROW. On p. 129 of the brief, and p. 249, we have collected a number of cases upon the subject.

Mr. EDMUNDS. What case have you just referred to?

Mr. STORROW. Clifton *v.* The United States, 4 How. 242.

Mr. STORROW. One expression of Judge Nelson's in that case was: —

"It may be well presumed, if the more perfect exposition had been given, it would have laid open deficiencies and objections, which the more obscure or uncertain testimony was intended to conceal."

Standard Measuring Co. v. *Teague*, 15 Fed. Rep. 390, GRAY and LOWELL, JJ.: "It appears from the absence of testimony which would not fail to be produced if it could be found, that this invention was wholly new."

One does not need to discuss the question, when *out of forty persons employed in that shop they cannot bring a witness to prove even an attempt to talk in ten years.*

I spoke to your Honor of the string telephone. I have one here now. They can be bought on the sidewalk. When this thread is extended, and a word is spoken in this tube, the sound made in there can be transmitted. This telephone consists of a tin tube with a bladder at each end of the string.

That leads me to make one further remark about these Drawbaugh instruments, and about those tests in New York. In those tests in New York of these instruments, there were undoubtedly a good many words that got through in the course of the three days. There was one set of instruments which got through fifty or sixty words in the course of an hour or two. What does that mean? They were not Drawbaugh's old instruments, they were improved reproductions. What would it mean, supposing the old instruments had done that? If I take an apparatus and read through it a single sentence of fifteen or twenty words, and hear it all, I do not want to do any more; it is a perfectly good instrument. If I read forty sentences and get twenty words only out of them, I do not want to do anything more, I know it is worthless. It is not a question of whether, in a certain number of days, a certain number of words can be heard; but it is a question whether the instrument is reliable and practically worth anything to tell one man what another man says; in the language of the Morse patent, "for the conveyance of intelligence by electricity." Even the New York reproductions up to **D** and **E** will not do that.

I want now to go back a little and call the attention of the Court to some witnesses whom we have called. They are witnesses to whom, from their positions, Drawbaugh would have been certain to have disclosed the telephone if he had it, but who never heard of it.

One of his friends was *Mr. Andrew R. Kiefer* of Harrisburg, superintendent of telegraphs for the Pennsylvania Railroad Company. Drawbaugh knew him for a great many years. He had put up the electric fire alarm for the city of Harrisburg, and kept a little electrical-supply store in Harrisburg. He was a partner in the manufacturing firm of Hahl, Kiefer & Co., manufacturing electricians, having a factory at Washington and another at Baltimore, and employed in making apparatus for the signal service. Drawbaugh was in the habit of going to him frequently and getting electrical supplies from him, — the old parts of condemned railroad instruments, for instance, which Kiefer gave him. He talked with Kiefer about his own electrical experiments. He showed to Kiefer, at one time, an electric clock; at another time he carried in and showed to him a telegraph key which he had made, and wanted him to use it on the fire alarm. That went on year after year, from 1870 down until after Mr. Bell was heard of, but he never once said "telephone" to Mr. Kiefer. The defendants went to see Mr. Kiefer before we did; they spent two evenings with him before we ever to him. There are a number of cases in the brief (one of them I have before me, but I will not stop to read it) where the Court say that if there is a disputed question of fact, and the party upon whom the burden of proof lies does not call evidence tending to support his side, and does not call those whom the nature of the case would permit, and does not call all those whose positions give them the best opportunities for knowledge, the Court must assume, and may instruct the jury, that his failure to do that is a failure to procure what Judge Nelson called a more perfect exposition, and was conclusive that there was evidence which would justify the inference, that if produced it would have been adverse to them.

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Again another witness, *Simon Cameron Wilson*, now mayor of Harrisburg, was long before 1870 and up to the spring of 1875 superintendent of telegraphs for the Northern Central Railroad, of which Mr. Don Cameron was president. He knew Drawbaugh in the same way. Drawbaugh used to go to see him. He had for the railroad a little repair shop for electrical apparatus, in Harrisburg. Drawbaugh used to go there and would get from him condemned instruments, coils, battery plates, and so forth, which Mr. Wilson could very properly afford to give him. He took Mr. Wilson to see his magneto telegraph key; he took his clock to show him; he went to him from time to time, and talked to him about electrical experiments, but he never showed him a telephone. Mr. Wilson was upon the stand and testified explicitly to that. That, again, is not a question of memory. Think! A man who wanted to get the attention of some intelligent person, and going month after month to men like Mr. Kiefer or Mr. Wilson and never showing them a telephone. For Mr. Wilson, see brief, p. 275; app. 334, 358, 428.

That is not all. We have assertions on Drawbaugh's behalf, repeated by witness after witness, and proving, if they prove anything, that he believed a talking machine was the greatest invention that ever was made, and that it would supersede the telegraph. One of them says that Drawbaugh's brother told him way back in 1869, "The telegraph ain't going to be nothing now no more." It is to be at once superseded by Dan's invention. (Egolf, defts, iii, surbtl, 1024). See for a collection of quotations, brief, p. 80 *et seq.*

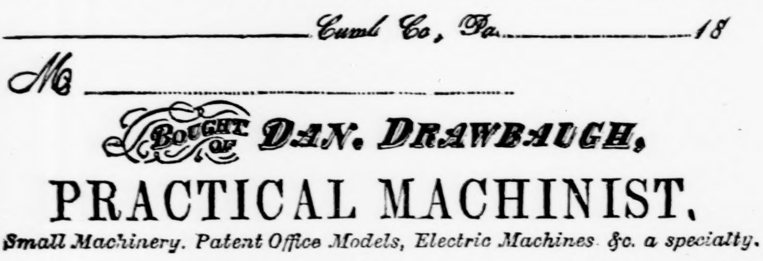
In 1874 he went to work to make a new kind of telegraph key, to work without a battery, — an instrument consisting of a coil like this, for example; an electro-magnet erected upright on a board; and over that was placed a heavy, permanent three or four bladed steel magnet. If you move that permanent magnet you generate a current in these coils. This permanent magnet rested on trunnions, like that, and with a handle or knob put there at the back end [*designating*]. Depress that knob and you lift the front end of the permanent magnet which normally touches the electro-magnet. That suddenly pulls them apart, and in that way you generate a current, and in that way, by properly spacing these movements, you make a succession of currents and spell out the letters of the Morse alphabet of longs and shorts.

Having invented something which was to supersede the telegraph, and from his poverty being unable to make another one for sale, he invented this telegraph. He claims that he invented it. At any rate he made it. It had existed for years in better forms, and was of no practical value then (complts, ii, 1383). His great desire was (as he expressed it to somebody, or as somebody says he expressed it to him) to get a chance to try his — telephone (?) — on a real line (Eicholtz, defts, iii, 154) a mile or so long, which would convince everybody, and then everybody would want to buy his — telephone (?) — they say. One day he got a chance to try something on a real line. David Hauck, in 1874, took him to Mechanicsburg, introduced him to a telegraph operator there, and got for him permission to try — what? Why, this magneto key. This man who had superseded the telegraph by the telephone, and who only wanted a chance to try it on a real line, had also made a magneto key, and when he got the chance to try something on a real line, when he got an introduction for the purpose, he took this key up for the purpose of trying it. The key was very heavy and cumbersome, and would not work quick enough. Did he then pull out from his pocket a telephone and say, "Here is something that is going to supersede the telegraph; never mind that failure"? No, sir. He went home and made another key on a different plan; and that second one cost him more money, time, labor and materials than it would to have duplicated a dozen telephones — if he had had any. When he got that made, he put it on exhibition in a store in Harrisburg, and got his friend Lloyd to come in and see it, got Mr. Kiefer to come and see it, and asked Mr. Kiefer if it would not do to take the place of the fire alarm, and wanted him to try it, and put it on street boxes. His idea was, I suppose, to generate a current and ring an alarm at the central office. He carried Mr. Wilson to see this key. He published an advertising card, one third of which is filled with the description of this magneto-electric machine designed to be used for fire-alarm and for short-line telegraphs. For the references and quotations about the key, see brief, p. 322.

That is the man who, during all these years, they *say*, did not think of anything except a telephone, could not do any work on anything except a telephone, and was trying his best to give publicity to a telephone. But this is what he *did*. Is that positive testimony, or negative testimony? Is that something which merely gives rise to a strained inference? Why, sir, in a life filled with such things as his was, there is not a crack big enough to get a telephone into. A man whose mind was full of telephones could not come down to such things as that.

Let me go on a little further in my statement about the things he did do. I ought to say, of this testimony from Mr. Kiefer, Mr. Wilson and Mr. Hauck, about carrying this key to Mechanicsburg and trying it, and to Harrisburg and exhibiting it, that there is not a word of contradiction. They called witness after witness, but there is not a word to contradict that. Those are facts, authentic facts, ultimate facts.

A good deal was said in the answer about this man's abject poverty and want of tools. I will speak first of the tools. I need not



Cumb Co, Pa 18

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Bought of **DAN. DRAWBAUGH,**

PRACTICAL MACHINIST,

Small Machinery. Patent Office Models, Electric Machines &c. a specialty.

say much more than to refer to this advertisement which he published between June, 1874, and December, 1876. It was printed by Holsinger, and is of the same new type as the card. See defts, ii, 996.

He did do a great deal of electrical work for himself. The story is, that he thought of nothing and did nothing but work at telephones; and he has himself testified and asks you to believe that he never in those ten or twelve years laid aside a telephone for a moment, except for some gainful occupation to support his family, and then regretfully, and that he never thought of anything else, never had a moment to spare for any other purpose. On pages 321–2 of the brief, your Honor will find a list of things which he did make in the years 1872, 1873 and 1874, things which involved more work, more labor, than fifty or a hundred telephones. He pretends that he invented them. If he did, they required more labor and more experimenting than was involved in two hundred telephones. Let me read the list. He made three galvanometers, — pretty difficult and nice instruments to make; also an alphabet and dial telegraph, to spell out words, worked by magneto currents, — a difficult instrument to make, requiring nice work, nice adjustments, clock work, etc.; an autograph telegraph, by which you write upon a piece of tin foil with non-conducting ink, or on a piece of paper with metallic conducting ink, and by passing that through a particular electrical contrivance, there will be reproduced, at a distant station, a fac-simile of the handwriting, — an instrument requiring an extremely nice kind of work, electrical work and clock work. It is very old and of no practical use. He made this magneto key, and when that would not do he made another one. He made an automatic fire alarm, — a contrivance made of two pieces of metal, of different material, so arranged that when they are heated, as in a room by an accidental fire, they expand unequally, bending one way or the other, and thus make or break an electrical contact, start or stop a current and ring a bell — a very old invention. He made one of those.

The assertion is that he invented that or improved it. He went so far in the making of electrical contrivances that instead of buying wire wound with thread, he made a machine to wind the wire. The telephones that he pretends to have made up to that time have, I think, four magnets in all; he could have bought the wire for those magnets ready wound, ready made for use, for one twentieth of what it cost him in time and labor to make that machine; half a dollar would have been enough for all that; but he was doing so much electrical work that he made a machine to wrap his wire with. Then he made a gear-cutting machine, for cutting the gears of the electric clocks which he was making. He borrowed from a jeweller in the neighborhood a gear-cutting engine and then he made one in place of it, and when the newspaper gave an account of the one that he had made, they said it cost from $60 to $70. Perhaps it did not cost him that in money, for he made it himself. Then he made the electrical clocks, which I have described. He made clock after clock, — all of his own resources and before he got any partners in it. Think of what those clocks required! There were three or four large clocks. Brass castings were made purposely for them. They had large carved cases, one of them being seven feet high and four feet wide, of walnut. To make them he constructed a gear-cutting engine; to wind the wire with thread he invented a wrapping machine; and he says he constructed a solar transit to take the time of day by to regulate his clocks.

Can you see in that picture the man who had not the leisure, nor the money, nor the materials, nor the tools to make another set of instruments just like these telephones, and take them over to Harrisburg for exhibition and sale? He spent month after month and year after year upon those things. That is not what he did not do; those are things that he did do. Does not that drive the telephone out of his life? Does it leave any room for it?

It is worth noticing that he says that all those things were his own inventions. Is he that kind of a man? His story is that he invented the dial telegraph, the autograph telegraph, the magneto key (to be used without a battery), the fire alarm, automatic telegraph, the Giffard injector, etc., when every one of them were known, and descriptions of them published years before he touched them. And yet, he made all his neighbors believe all that stuff, and those are the same neighbors who come to testify that he made the telephone. For this see brief, pp. 320–329; and that they are all old, complts, ii, 1383.

This key is of considerable importance in the case in one respect. The defendants have one witness, a pretty intelligent man otherwise, a Capt. Moore, who says that in 1875 or 1876 (1875 he wishes to put it), Drawbaugh showed him a talking machine or something that was to be a talking machine; he says it was the tin-can B with the bladder, and that he told him it was to take the place of the fire alarm in cities. They asked him the question, "Did Drawbaugh tell you what it was for?" and he says, "Yes, that it was to take the place of fire alarms in cities." Did Drawbaugh tell you how it was to be worked. Yes, by a magnet without a battery. Well, nobody ever supposed that a telephone was to take the place of a fire alarm; but there he had in that shop at that time this contrivance, to be worked by a magnet without a battery, which he had been offering to the superintendent and the constructor of the fire alarm at Harrisburg, and asking him to use it on the fire alarm, and which he had advertised for that purpose. When you get that from one of their most intelligent witnesses, whom are you going to believe? He got them all mixed up, those babies, and he didn't know which was which. (Brief, pp. 322–5, 507; app. 209.)

Your Honor would be interested, perhaps, to know, and would hardly suspect it, if I did not tell you so, why he made those clocks and all those things. May it please your Honor, he made the clocks, — four of them, — got up a company, got a patent upon them, and went into the business of manufacturing them, for the purpose of earning money enough to patent the telephone. I will read it (defts, ii, 1114): —

> "*Q*. 1739. You have testified in effect that after unsuccessful efforts to induce different people to take a half interest in your telephone invention, and furnish the money for procuring patents and introducing it into public use, you expected other parties to go into the manufacture of the magnetic clocks, and to go into the manufacture of the improved faucets; what was your object in embarking upon the clock business and the faucet business, in 1878 and 1879?
>
> "*A*. My object was this, that I was pretty poor; I was anxious to get some party to take an interest in and run that business, to make some money by it; I was anxious also to make a raise to have money to secure my telephone improvements; I know that I often desired to have made arrangements — get a job — that I could make some money for that purpose."

Can the ridiculous go further!

One important effect, meaning and bearing of these occupations I have named is this: Witness after witness has come on the stand (I should say a majority of the defendants' witnesses) and sworn that during those years they went to Drawbaugh's shop, some of gear-cutting machine, for cutting the gears of the electric clocks which he was making. He borrowed from a jeweller in the neighborhood a gear-cutting engine and then he made one in place of it, and when the newspaper gave an account of the one that he had made, they said it cost from $60 to $70. Perhaps it did not cost him that in money, for he made it himself. Then he made the electrical clocks, which I have described. He made clock after clock, — all of his own resources and before he got any partners in it. Think of what those clocks required! There were three or four large clocks. Brass castings were made purposely for them. They had large carved cases, one of them being seven feet high and four feet wide, of walnut. To make them he constructed a gear-cutting engine; to wind the wire with thread he invented a wrapping machine; and he says he constructed a solar transit to take the time of day by to regulate his clocks.

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> " *Q.* 1739. You have testified in effect that after unsuccessful efforts to induce different people to take a half interest in your telephone invention, and furnish the money for procuring patents and introducing it into public use, you expected other parties to go into the manufacture of the magnetic clocks, and to go into the manufacture of the improved faucets; what was your object in embarking upon the clock business and the faucet business, in 1878 and 1879?
>
> " *A.* My object was this, that I was pretty poor; I was anxious to get some party to take an interest in and run that business, to make some money by it; I was anxious also to make a raise to have money to secure my telephone improvements; I know that I often desired to have made arrangements — get a job — that I could make some money for that purpose."

Can the ridiculous go further!

One important effect, meaning and bearing of these occupations I have named is this: Witness after witness has come on the stand (I should say a majority of the defendants' witnesses) and sworn that during those years they went to Drawbaugh's shop, some of them repeatedly, and saw him always at work on talking machines, and do not recollect seeing him on anything else. Witness after witness swears to that. Is that true? Why, we know these things that he was making. What is the value of a man's testimony, when one man after another comes up on direct examination and swears he went there day after day, some of them twice a week during those years, and never saw him working at anything but talking machines. Either that is pure romance, or else they have mixed up two or three things together.

On page 331 of the brief, about twenty or thirty of them are there collected. Let me read Drawbaugh's statement (defts, ii, 864): —

"*A*. I have never abandoned it, from the earliest time of working at it. I have left it lay for a time that I was compelled to work on other work, but never abandoned it.

"*Q*. 415. For how long a time did you ever let it lie at any one time without doing anything at it in the way of study, experiment, or the making or testing of instruments?

"*A*. I could hardly say how long I left it lie at one time; it might have been, maybe, six months sometimes that I would not do any work on the machine, but I don't suppose there was a week but what I was engaged in the way of studying on it.

"*Q*. 416. Why were you compelled to let it lie at times and devote your attention to other work?

"*A*. I was compelled for the reason that I was poor. I had a large family to maintain.

"*Q*. 417. Was the maintenance of your family dependent upon your daily labor or not?

"*A*. Yes, sir; it was."

"*Q*. 424. State whether your work in inventing the electric speaking telephone, and in subsequently improving the instruments, from the time of the original cup transmitter down to the year 1879, did or did not consume a great deal of time that would otherwise have been devoted to your daily labor for the support of your family.

"[*Objected to by Mr. Storrow as leading.*]

"*A*. It did.

"*Q*. 425. Did your devotion to this telephone work during that period render it necessary to keep your family more closely — that is, more economically — than would otherwise have been the case, or not?

"[*Same objection.*]

"*A*. Yes, sir; it was necessary for me to economize. I was contracting debts which were demanded of me, and I was compelled to stop working on these machines to try and get clear of debt. I know that went very reluctantly with me, as I was anxious to work on these machines.

" *Q.* 426. Did that occur more than once or only once, that you were compelled to stop working on these machines and pay debts that were demanded of you?

" *A.* Yes, sir, often."

Never left it, except for gainful work, and then reluctantly. This is the picture of an inventor, not overdrawn, certain to be true if he had invented the telephone. Contrast it with the *facts*. They exclude all possibility. More work on this unprofitable jimcrack than on the telephone a dozen times over, whenever it was. Can you trust the man or the party who draws so false a picture?

The money part of the matter is collected, brief, 343. The actual fact proved by his own deposition, or by the testimony of witnesses called by him is, that between the spring of 1867 and the summer of 1876 he received more than $10,000 in cash; these figures foot up to $10,712.91. Besides that, were the most of his earnings as jobbing machinist. He kept a mechanic's shop, and did work for farmers on agricultural implements, made models and patterns and all sorts of things. Those he does not give us any account of, except in one or two instances, which we already knew of. He had a double house, and lived in half of it, letting the other half all the time to a good paying tenant at $110 a year. Those are some of the receipts of which we know. There is one item of $1,000, — proceeds of the Gardner note discounted. That was a note which he took on his faucet invention and discounted, and when the party whose business it was to pay it failed, it was not paid, and never has been paid by any one. It was a lien on Drawbaugh's estate; but he actually got that cash into his own hands. In another case he received $500 money borrowed in 1868. A man who could have borrowed $500 could have borrowed $75. Twelve hundred dollars was received on account of the sale of the house in 1876; about $6,000 to $7,000 of it was money which actually came to him, — fresh money, either from sales or earnings, $5,000 in money for the faucet besides the $1,000 note and $1,000 in stock, and the rest of it was money for turning property over. It is folly to say, considering the nature of this invention and the known character of inventors, that for ten years he was trying to raise $15 or $35 to patent a telephone, or that out of the money which he received he could not have paid that sum.

The defendants put him on the stand. They knew that we knew about that. We had put a good part of that money statement into our moving papers upon the motion for an injunction. They put him on the stand, not to deny that he got any money, but to say what he did with it. Certainly he did not spend it on telephones; they admit that; he spent it on all kinds of things. He could furnish a house, fix it up, and provide himself with a parlor organ and other necessaries of life; he could give $1,000 to his father to help him buy a farm in 1869, and afterwards give his father $400 to stock the farm — a very amiable thing to do. But there was a fortune coming to his family if he could get $50 with which to patent this machine. He might still have given his father $1,350. It is perfect folly to say that he could not have kept $50 out of that, or that out of all his job work during those years he could not have spared $50 to patent the telephone, if he had one.

There are two or three very interesting things in his testimony about money matters. They undertake to account for this money in various ways; they undertake to show how he paid it here and there, and to go into a very minute account. They brought in little bills of $5 and $10 that he paid, — so very minute as that were they, in order to show how he spent his money. It is very ridiculous to see the way they jumped the big things. They brought in those little bills of $5 or $10, and then had him testify that he paid, he thought, as much as $1,000 out of that money for old debts which he had contracted before the Faucet Company began. Well, $1,000 is a good deal of money; its payment would naturally leave some trace behind, some receipt, something to show for it; but he could not say where he had paid it; he had paid out a large amount of money for old debts, he said, — about $1,000 that he could not account for. We asked him to whom he paid it to; he didn't know. Then we asked him again (defts, ii, 1117): —

"X Q. 1749. In your answer to the 488th interrogatory, on p. 876, you speak of using a portion of the money you had from Hertzler and others, in payment of old debts to the amount of $1,000 or more: to whom did you make those payments?

"*A.* I don't remember to whom; I generally had a great many debts of different kinds, — store bills, and bills for flour, coal and wood, fuel — I could not just enumerate, and I could not enumerate the parties I paid it to."

He could not have been in such a very bad condition as to credit, if the storekeepers were willing to let him run up a debt of $1,000. It would have swamped all the storekeepers in the village.

"*X Q.* 1750. Can't you name any of the parties to whom you made those payments?

"*A.* I might name some, but I made payments more than once; if I have to go by the time when I got the money — I can't recollect who had the warehouse where I got my coal — Graybill & Zacharias; I know I paid them for coal; there was a party went by the name of Natcher who run the mill; I know I paid him about that time; as near as I can recollect there were store bills of parties that had stores; I paid them some money.

"*X Q.* 1751. You mean stores at Eberly's Mills?

"*A.* Yes, sir; I cannot enumerate the different bills I made."

So the only men he can name, to whom he paid that $1,000, which he received in 1867–8, were Graybill & Zacharias, for coal, and Natcher the miller. But Graybill & Zacharias did not exist until after he had received the last cent of that. He says that it was paid for old debts previously contracted; but that firm did not exist until the spring of 1869. We brought their partnership articles to prove that. Afterwards the defendants called Graybill to the stand for another purpose, but they didn't ask him about that debt. Natcher, the miller, did not move into that part of the country until 1870, and this money was received between 1867 and 1869 and paid out for old debts, so they want you to believe, contracted long before that; and all he ever paid Natcher in his life was $5.27. His whole bill to Natcher was about $14, and part of it was paid in labor. What are you going to do with that kind of an accounting? J. K. Taylor was brought on the stand; and he testified, from memory, that in the middle of the year 1867 Drawbaugh paid him some money, between $200 and $300, if he recollected right. They brought him to show that that was an old debt. It is pretty bad testimony when a man testifies fifteen years back from memory, to amounts and dates, and no papers are produced. Then *they* asked Drawbaugh (defts, ii, 1118): —

> "*Q.* 1759. Mr. John K. Taylor (on printed page 662 of defendants' record) testifies that you paid him between two and three hundred dollars, balance of an old debt that you owed him for some years, and that you made the payment in September, 1867. Do you remember whether that was out of the money that you received from the Faucet Company?
>
> "*A.* I don't remember; it may have been, I can't remember the different payments."

I will not stop to go through with it all; but two or three of them are very extraordinary statements. They are collected in our brief, pp. 344–358. I will mention one more. He told the story, on his direct examination, that in April, 1873, he, with George Kissinger, who turns out to have been storekeeper at Eberly's Mills, signed a note for $60 in favor of George Leonard; Drawbaugh thinks he had to pay that out of some money he received in July, 1873. In July, 1873, he received $425, when the Faucet Company was wound up. Certainly there was an opportunity to get $40 or $50 for the patent. He used $300 to pay off a bottom mortgage on his house — he had bought a house for $2,300 and had paid $2,000. Well, a mortgage like that does not press very hard upon anybody; perhaps the best thing he could have done when he got $300 was to pay off that bottom mortgage on his house; but it would not have been if he had had a speaking telephone. A mortgage like that does not trouble a man; the security will carry it. What did he do with the rest of the money? The Leonard note of April, 1873 for $60, was produced, and he said, as near as he could recollect, that he paid that note out of that money. Very good. That accounts for $60. They then produced another note for $103 to Leonard, which he says he paid out of some other money a couple of years later, and that he was a good deal pressed. It turned out that he owed the storekeeper, and the storekeeper and he together signed a note for about the amount that he owed the storekeeper, and Leonard, the capitalist of the village and the owner of the mill, trusting to Drawbaugh's credit, discounted this note for $60 — that is the $60 note. And here is a man who could not borrow $15 from his neighbors.

Why, his note was discounted by the money lender of the village. When that note came due, instead of bothering him for the money, Leonard loaned him some more, and the two sums together went into the note for $103. If they seriously proffer this testimony for an accounting, there has enough slipped out there to pay for a patent; yet they spent three days of his direct examination on this mass of trifling and falsities.

But that is not all. He has thus proved himself that his credit was such that the capitalist of the village was ready to discount his note on the security of his name alone, without any other security for $60. See for this, brief, p. 351.

There is another occurrence that is very touching. The defendants called Reneker, a neighboring farmer, who says that he loaned Drawbaugh $20 in May, 1877 (defts, i, 247): —

> "*Q.* 37. At the time you made that loan to him, was there any other transaction between you and him?
> "*A.* There was: he wanted to trade me a bureau and secretary combined, on provisions, such as meat, potatoes, butter, eggs and lard for his family, and we traded in that way.
> "*Q.* 38. Did he or did he not, at that time, say anything about being in want of provisions for his family?
> "*A.* He did say that he needed provisions very bad for his family."

Then Drawbaugh testified on direct examination (defts, ii, 900): —

> "*Q.* 623. Mr. Jacob H. Reneker has testified (page 247 of defendants' printed record) that in May, 1877, you wanted to trade him, and did trade him a bureau and secretary combined for provisions for your family: do you remember that transaction?
> "*A.* Yes, sir; I do.
> "*Q.* 624. Why did you trade off your bureau and secretary at that time?
> "*A.* I needed provisions for my family.
> "*Q.* 625. Had you no means to get such provisions except by trading away your household furniture?
> "*A.* No, sir; not at that time — I can't — I had no other means."

He was moving at that time from the house which he owned in Mechanicsburg, into a house which he had hired at Eberly's Mills. It took sixteen horses to haul merely his household furniture, among which were two secretary-bureaus, one that he had made and one that he had bought. Having no use for two, he put one in his house and sent the other down to his machine shop and stored it, and then sold it to a neighboring farmer and took his pay in provisions. That testimony was put in as if this fellow was in such a condition that he had to sell his household furniture for provisions, when he was simply selling his superfluities. May it please your Honor, if the telephone story is dressed up no more than that, it is like the difference between yes and no. This matter is in the brief, p. 352.

Now, I wish to come to the depositions for the defence. I ask your Honor to read those with a great deal of attention.

You cannot read those depositions, or see their value, by simply taking a statement that a man went there at such a time and saw such a thing, or heard such and such a thing; but you have got to analyze those depositions and to study them with a good deal of care to see their value. They have got to be weighed; it is not simply enough to have noses counted. We begin with rather a bad state of affairs; we begin with this fact: that more than one half of those witnesses, if they prove anything, prove that the tumbler and the tin can were perfect speaking telephones; that anybody could go and talk through them without difficulty. *There are more witnesses to those two instruments than there are to all the others put together.* More than four fifths of the witnesses are to the instruments, which I stated to your Honor yesterday, F, B, C, I, A, alleged to have been made before the close of 1874. They have to begin with that. Now, we shall find another trouble. We shall find that their own proof, when we come to analyze it, is so inconsistent, that of itself it cannot stand. I do not refer to little inconsistencies of detail, in dates and appearances. There is one inconsistency, for example, to which I will refer, and which occurred a great deal.

Drawbaugh's story is that he went on improving these instruments, making them better and better and better, and always showing the best one; I do not mean to say that he swears that he never *showed* the superseded ones, but for exhibition purposes he *used* the best one. We find the witnesses, some how or other, nearly all swear to that instrument, the tumbler F and tin can B. He has witnesses in 1876 swearing to the tumbler and the tin can; but he has not any witnesses, or at most one or two doubtful ones, to the next instrument C, which is alleged to be a great deal better, and which is apparently better, and, therefore, would be the one used as soon as he got it. Those are not inconsistencies of detail, merely. The stories which these two sets of witnesses tell cannot both be true. They may both be false; they cannot both be true.

What does the Court do when it finds that one half of a party's witnesses tell one story and the other half tell a story absurdly inconsistent with the first. Take the case that we have here to meet. They say that these things were known to everybody from 1867 to 1868 — to everybody! Suppose that you find out of their own record that the man's brother never saw one and never was spoken to about one in 1872 or 1873 or 1874; what will you do with those stories? Which are you going to believe? They cannot both be true. Is the Court in such a case to take such testimony as now suits the defendants; discard all those portions which do not now suit the defendants' desires and keep the rest? No; the Court will say, Take it all away; I have no means of telling whether any of it is true.

I have spoken of only three or four of our witnesses: Mr. Kiefer, the telegraph superintendent; Mr. Wilson, a telegraph superintendent; Mr. Weaver, a patent solicitor and an old friend of Drawbaugh's; Mr. Hauck (the one concerned in interference matter); and Mr. Rupp, Drawbaugh's partner. If there were no other witnesses in the case but these, with whom he came in contact before 1876, we should have the most perfect and absolute proof that his story was false. But, besides those we have thirty-five or forty witnesses, whom we have put on the witness stand, frequenters of his shop year after year, neighbors, men who have known him from boyhood, living along by him, knowing all the gossip of the neighborhood, and they never knew anything about it, not one of them.

The defendants have put on witness after witness, neighbors, partners and workmen, and they never knew anything of it. Now, that is not negative testimony. Think of the condition of those men. They produce a man who says, I, being at Drawbaugh's shop at a day which I assert to be at such a time, saw such and such things. How can we contradict that? We had no witness, no friend there. But we bring proof of the alleged inventor's surroundings and conduct. Courts have to rely upon such proof in such cases. It is what they most rely on. But besides that, we call a man who says that he was in Drawbaugh's shop once a week, or once a month, for three or four years, and that he never saw this, that Drawbaugh never showed it to him. Can they contradict that if not true? Drawbaugh was there every time our witnesses were at his shop, and they could have produced him to contradict them; but *they have not done it in one single instance*. That is not all. When a thing like a speaking telephone is shown to a man, he may forget the details, be unable to identify it; but the fact, if it was a fact, sticks. Perhaps one man might forget it, but not many. The trouble with men is, not that things escape the memory and nothing is left of them so that they cannot be recalled; it is that one becomes confused, that one mixes two dates, or mixes one event or one thing with another. The *illusions* of memory are the greatest troubles. Errors come from misrecollection, but not often from nonrecollection. The authorities are full of such instances. In "prior invention" cases, the courts recognize that the difficulties come from misrecollection, not from the vanishing of facts. When it comes to a question of mere detail, the man who recollects is better than the man who does not. But when it comes to a thing which affects the imagination, which rivets the attention even for a moment, it cannot be forgotten, it does not go and leave no trace, though it may leave a distorted trace. It may leave a distorted trace, but it leaves a trace of some kind. That is not all.

A man might under certain circumstances find that he does not recollect a thing, but if he ever knew of it, it will be brought back to him when his recollection is refreshed by suggestions of time, place and circumstances. The defendants have had an opportunity to do this with every one of our witnesses. Some of them might have clean forgot, but that could not have been the case with thirty or forty. About one half of these witnesses who were so called by us were witnesses whom the defendants had been to see before we saw them, and had tried to find something in their recollection. They state that they saw nothing, and Drawbaugh does not contradict them. But that is not all. Witness after witness was produced and cross-examined day after day. Why did not counsel say to the witness, "Don't you remember, Mr. Witness, that on such a day, at such a time, under such circumstances, this man Drawbaugh, sitting by my side, showed you a talking machine, and talked through it?" and then follow it up by calling Drawbaugh? Never once. There was a feeble attempt with one witness to do something of that kind, a witness whom the defendants had gone to see after we had summoned him and an hour before he was to appear upon the witness stand. It failed, and it was never tried again. Drawbaugh has not gone on the stand to say that he ever informed them; this course of conduct shows still more strongly that he knows he *did not. That he was silent about it in his intercourse with them is a proved fact*, the value of which the Supreme Court settled in Brady's case. But here we have ten times as many such associates and an invention more certain to have been communicated, if made.

Now, I go on with their witnesses. I do not propose to go through with them all, but I wish to call your Honor's attention to a dozen of them as samples.

The witnesses for the defence may be divided into two classes: those who say that, going to Drawbaugh's shop, they talked through a telephone, and heard and understood; and those who say that, going to his shop, they saw something which he said was a talking machine, but never took the trouble to talk through it.

It is only the first class which is of any considerable importance, and it is only the first class that even had an opportunity to distinguish between a machine that could talk and a machine that could not. Moreover, a man who says that he went there, whether frequently or not, and that Drawbaugh talked to him about a talking machine, but didn't talk through it, admits that it was to him a something so inconsiderable, so trifling, that it did not make any impression upon him; he cannot amount to anything as a witness to such a matter after many years.

They have forty-eight or forty-nine witnesses who say that before the date of the Bell patent they heard speech through Drawbaugh's instruments. I wish to go through the testimony of six or eight or ten of them, to show what it amounts to. They are collected in the brief, arranged by years, beginning at page 382.

Zacharias (brief, 383; app. 22) was a miller in that neighborhood. He says that at various times he has been at Drawbaugh's shop, and at times between 1869 and 1874 he went there and saw talking machines, which he says were F and B, and talked through them, and understood everything perfectly. Now, the Court knows that is not true. Then he tried to fix the date more exactly. He said it was between 1869 and 1874, and he thought it was about the time that the Haucks were making faucets. But they did not begin to make faucets until the summer of 1873. Then they asked if it might not be that some one else was making faucets about that time, and he said, "Yes," it might have been the old Faucet Company. They dismiss him after the statement that he saw this on one occasion, when he went to Drawbaugh's shop to buy a tram to level off a new set of stones which had been put into the New Cumberland Mills. Then they offered the millwright who testified from his books that he put in and set up the new mill stones between June 18 and July 3, 1869, and who recollected that at that time, while he was there, the tram was bought from Drawbaugh for the purpose of facing up these stones, and that the tram was bought between June 18 and July 3, 1869.

All this seems quite neat and logical until it turns out when the treasurer and book-keeper of the Faucet Company is called by the defendants, that instead of the tram being bought at the time stated, it was actually bought four months before, — March 17, 1869; that he did not buy one at the time stated at all. Now, what are you going to say about that? He is building his date upon an association which turns out to be false, though they have two witnesses to swear to it; the whole bottom drops out. He may just as likely have seen it at any of his visits in 1876-7-8. They would have to begin again to build up. But they did not attempt it.

Samuel Nichols (brief, 384; appendix, 69). He began by saying that he was a civil engineer; but it turned out that his profession was that of running a steam engine at $33 a month, and that he had been doing that for twenty years. He said that he lived at White Hill, about a mile from Drawbaugh's shop, in 1868, and the second summer after that he went to Drawbaugh's shop with his "son-in-law, Samuel Bruce," and that he then heard talk through a talking machine and "heard all that was said." He was asked on cross-examination how much it was that he heard and he said, "Two words," and he was asked how much his son-in-law heard, and he said, "Two words." We do not know now whether those two words were spoken. He says that he went there with "my son-in-law, Sam. Bruce"; but it turns out that Sam. Bruce did not marry this man's daughter until June, 1876, three months after our patent; and that Sam. Bruce's first wife did not die until 1875, and that he was not a visitor at the house until 1875; that he was only courting Miss Nichols three months before he married her, and that the marriage was against her father's wish. We proved these facts by calling the clergyman who married them, by producing the marriage certificate, and by Nichols's son. The clergyman knew Bruce's first wife and knew when she died, and by calling a son of this Nichols, who had been a workman in Drawbaugh's shop in 1874, we proved that there was no telephone there when he was there. Afterwards they called Bruce's widow about some other things, but they did not ask her about Bruce coming there to visit the family. Well, that is not all. Nichols described the way in which they talked, — the instrument in one room and a wire run through a partition, and across a space into another room. He said that was the way they talked from one room to another. Now, those rooms did not exist until 1875. The partitions in that shop had been changed from time to time, and the rooms did not then exist. So he went there with a son-in-law, who did not exist in 1876; and talked through partitions which did not exist until 1875.

But that is not quite all. Nichols said that before he went there he talked with George Free about this. George Free was one of their witnesses, and he don't pretend to any knowledge of this thing before 1874 (defts, i, 505, ans. 6; p. 507, ans. 17). He is a relation by marriage of Drawbaugh. Thus Nichols was one of their first-rate witnesses who fix a date and who know it. It was the second summer after he had moved to the White Hill, he said, and yet he is as wrong as wrong can be. All that was heard was two words. It was the tin can **B**. Who does that witness help? There is his date shifted; they do not call anybody to patch him up, nor do they recall him to patch himself up. The tin can as the exhibition instrument, after midsummer, 1876, and two words the best it can do!

H. K. Drawbaugh (brief, 386; app. 170), a nephew of the claimant, is another witness. You will recollect that they said that before **C** was made, and at a very early time, — 1868–9, — they got perfectly good speech through these two instruments, the tin can and the tumbler. The first thing that H. K. Drawbaugh, the nephew, proved (I am not discussing whether any of it is true) is, that in the spring of 1870, when he was there, they did not even attempt to get words through. And yet they want you to believe that those were good talking machines for three years before that.

Harmon testifies (defts, i, 575): —

> " *Q*. 11. Did he talk to you, or did you talk through those machines **F** and **B** at that time, early in 1870?
>
> " *A*. No, sir; *not in words, not at that time*."

Now, these gentlemen want your Honor to believe that it is clear beyond question that three years before that he had got an instrument which did not need any trial, caused no trouble, but talked right off. That first answer that I read of H. K. Drawbaugh has a good deal of strength in it.

> " *Q*. 11. Did he talk to you, or did you talk through those machines **F** and **B** at that time, early in 1870?
>
> " *A*. No, sir; not in words; not at that time. He used to get me to make sounds at that time, — sounds that he thought had more force or more vibration to move the instrument clearly; I remember very distinctly of playing the violin in it.
>
> " *Q*. 12. How soon after that did he talk to you through the instrument, if at all?
>
> " *A*. A very short time afterwards. There were some words that we could understand only.
>
> " *Q*. 13. Give your best idea of the time.
>
> " *A*. It was not more than ten days or two weeks; it just happened while he was experimenting with that machine; I remember that very well.
>
> " *Q*. 14. When did you go to Waynesboro, Pa., to work?
>
> " *A*. In the spring of 1872.
>
> " *Q*. 15. Prior to your going to Waynesboro to work, did you talk much or hear him talk much through the instruments?
>
> *Ans*. Yes, sir; I was about the shop then a great deal.
>
> " *Q*. 16. Were the instruments in such a condition prior to your going to Waynesboro that you could hear and understand all [illegible] as said through them, or not?

"*Ans. Just for a little while at a time; they appeared to require a great deal of adjusting and working at — merely trials that he got me to help him.*"

They want your Honor to believe that five years before that (1872) they had instruments that needed no adjusting and made no trouble and through which they could talk off whole sentences. But the first answer that I read has a good deal of truth in it with regard to that: "He used to get me to make sounds at that time, sounds that he thought had more force, or more vibration, to move the instrument clearly."

The curse of this thing when we tried it in New York was not that we could not get enough of *vibration.* Any jar, any loud voice, anything except a most careful voice made it break, and the articulation was gone. Now, that man was in such a condition of knowledge and experience, if you believe this witness, that in the spring of 1870, so far from having the remotest notion of what a transmitter was to be, and how it was to work, that, when he did not get words, *he tried sounds that had more vibration.* Why that was the very thing that he should have avoided; the very thing that Reis ran into. If he were experimenting with a Reis transmitter, that is exactly what he would do. He had not the remotest idea of the operation of an instrument such as was "reconstructed" and operated in New York. (See pp. 102–5, *supra.*)

Mrs. Mary A. Darr (appendix, 617). We called for another purpose William Darr. At one time he had lived at Eberly's Mills, and moved away from there in the beginning of 1870 or 1871. The defendants had been to him and searched his memory long before we had seen him, and found that he had no knowledge of telephones. We called him, and he testified that he had no knowledge of them. They went to see him after we had summoned him, and an hour or two before he came on the witness stand; and when they cross-examined him they asked him, "Didn't Drawbaugh tell you that the time was coming when he was going to talk across the sea? and didn't you say to him, 'You had better try the Yellowbreeches first'?" which was the name of a little stream there. Then they ask whether Drawbaugh didn't tell him that he was making a machine? Nothing of the kind, he said. Then they called his wife. They had separated from each other, his wife accusing him of drinking; but Drawbaugh, who had known him twenty years, went to get him as a witness before we saw him. Among other things she said that she knew all about the telephone, that it used to be the most common talk in her household before she moved away in 1870, and that before she moved away in 1870 the talking machine was about the only thing that was talked of; that she didn't know anything about Drawbaugh and the village since, but before she moved away it was talked about and it was said that if he could get it to work he would be the richest man in the valley. We asked her what other inventions of Drawbaugh she had heard of while living there. His clock, she said. "What had she heard of the clock while living there?" Why, she had heard that he had completed it and taken it to Harrisburg and exhibited it. Well, he completed it, and took it to Harrisburg and exhibited it *in 1878*. This woman moved away from there in 1870; yet before she moved away she had heard what he did in 1878.

George W. Drawbaugh (brief, 391; app. 197) is another witness of some importance, — a nephew of the claimant. He lived next door to his uncle. He was a wagon maker, and worked somewhat in the shop at an early time, and afterwards he worked there considerably in later years. His story is, that the first time that he ever saw any talking machine was at a date which he stated to be the spring of 1870, three years after they want your Honor to believe Drawbaugh had them, when he was repairing a certain wagon known as Sadler's wagon for Mr. Sadler. He said he could not fix exactly the date when he did it, but he thinks that was the time, and that the lumber for the wagon was bought at Lee's lumber yard. Lee was then produced, with his books, and he proved that in March, 1870, he sold George Drawbaugh some lumber, and never sold him any afterwards. That seemed to be a pretty good way of fixing the date. This wagon was painted at Daniel's shop, and George says that at that time he and his uncle were trying to talk through the tumbler **F** and the tin can **B**; that his uncle talked and then he heard, but that when he talked his uncle could not hear anything. I believe, with possibly one doubtful exception, that is the only time that George says he ever attempted to talk through a talking machine at that shop. Well, upon the question of date, it seems to be as good evidence as they ever get; the books prove that he never bought any lumber after May, 1870. Now, it turns out that *the wagon was not made until* 1871. Daniel and George were painting a hydraulic ram on that wagon. Daniel Drawbaugh and Sadler were in partnership that year on hydraulic rams, which were Drawbaugh's invention, and were going to carry them around the country. They were only in partnership one year, so Drawbaugh testifies. We have their bill for a ram which they put in in 1871. Other evidence in their record proves the date. Daniel Drawbaugh, relating the incident over again, says that he recollects well that while painting that wagon, Norman Kahney, a neighbor, came along and they had some talk. Norman Kahney was called as a witness for the defence, and said that he did not move into that part of the country until 1871. What are you going to make out of that kind of association and fixing of dates? The moment you get a fact on paper there is found to be not a word of foundation for the story they build on such associations. They are only memory; memory in the weakest and most delusive form, because self-delusive. It is the well-known fallacy of the books on logic and of the juggler — fixing the attention on an immaterial fact, while the important assertion goes unchallenged.

But that is not all. They had a witness, *Joseph Ditlow*, who testified that he lived at Milltown a good many years, that he had been a good deal in Drawbaugh's shop, but had never heard of a talking machine until George Drawbaugh told him of it in 1877. After some transaction, which, if I have time, I will refer to, the defendants brought him back upon the stand, and in answer to their question, he testified that he did first hear of it from George Drawbaugh, but he thought it was a great deal earlier than 1877, though he had not any recollection about time. Then they brought a man who said he was living in Indiana in 1870, and that this man Ditlow boarded with him in the spring of 1870 and never again (fixing that date by books), and then told him there that he had heard that Daniel Drawbaugh had a talking machine — Ditlow saying that he had heard of it from George Drawbaugh. Now all this looked very nice. But when you find that George Drawbaugh did not know of it until next year, 1871, what becomes of that house of cards? If association upon association, structure upon structure, falls, on what are you going to stand? For this see brief, pp. 375, 392; app. 198.

Henry Bayler (brief, 354, 401; app. 44) is a retired merchant, apparently a man of some means, who had carried on a lumber yard and a planing mill, at a place called New Cumberland, three miles from Drawbaugh's shop, from the spring of 1873 until into 1877. It was an old lumber yard; there had been several partners; Eberly and Lee carried it on; then Lee alone, and then Lee and Bayler. Drawbaugh had been for many years in the habit of doing their machinist work, repairing their engine, and from time to time getting lumber from them, so that there was an account between them. Bayler testified that when he went there they were fitting up their works in the spring of 1873, and Drawbaugh did considerable work for them; that while Drawbaugh was doing that work, he had invited Bayler to come up to his shop and see an invention, a curiosity, but he did not tell Bayler what it was. Bayler went there. He says that he went to Drawbaugh's shop, he thinks in June, 1873; at any rate, it was in the first half of 1873, and there talked through a tumbler and tin can and heard Drawbaugh; and that he said, "Why, Dan, that is virtually a talking telegraph; why don't you patent it?" And Drawbaugh said, "I would if I had the means. Won't you come in with me and furnish some money?" Bayler says that he thought seriously of putting in $200 or $300, but that he was not satisfied with his partner and was a little disturbed about business arrangements, and he concluded not to do it. There is one thing that is certain under these circumstances, and that is, that if Drawbaugh showed him anything, he showed him the best he had. Now their story is, that in 1873 those old instruments **F** and **B** had been superseded for two or three years by this cuspadore thing **I** and by **C**, and that the tin can **B** had gone to the attic, and that the mice had eaten out the membrane. That is Drawbaugh's explicit testimony (brief, p. 154). Yet this man says that Drawbaugh invited him to come there, and showed him that very thing, and talked well through it. The Court knows that one of these dates is wildly false, or both.

We will go a little further. We asked him, How did they talk through the telephone? Where was it arranged? He says they had a tumbler in one room, and a wire went through the partition, and across a space or entryway, into a third room, as it were, where the receiver was, and where the person listened. But no such arrangement of rooms existed until 1875. This man says he never went there but that once in his life. He says it was in 1873. He describes on direct examination, as part of the answers upon which they rely, the rooms and the partition, when those things did not exist until 1875. Now, if a man makes an error of two years such as that in his testimony as a witness, he goes over the precipice. If he went there when our patent was a year old and saw the tin can and the tumbler, what is his testimony worth?

Mr. Bayler was then asked about Drawbaugh's finances. He said that Drawbaugh was very poor; that it was very hard to get money out of him, from his personal knowledge; that Drawbaugh did work for the firm at their lumber yard on their machinery, and that he wanted to be paid in cash as fast as he did the work; that he had heard at times that Drawbaugh did not know at night where his children's breakfast was to come from in the morning; that at times they had let him have lumber on credit, but that he wanted to be paid in cash for the work that he did, and to let the lumber go on credit, and that finally the man who wound up their business in 1877 had to sue Drawbaugh. Now, what is the fact? The fact is, that these firms, Bayler's firm and its predecessors, never paid Drawbaugh one cent of cash in the world; and that on the very day when Bayler says he went there, and that Drawbaugh was anxious to obtain a patent, when it required only $15 to file a caveat on an application, the firm owed Drawbaugh $20 or $30 for work that he had done, and there never was a time for five years, including that period, that these firms did not owe Drawbaugh from $20 to $50 or $60; that he never asked for the money, but was contented to let it go on; and from time to time he took some lumber to repair his house, etc. But that is not all. The last lumber that was delivered led to a quarrel, and to some litigation, and a suit arose. They had not failed, but a quarrel arose between the partners, and the business was put into the hands of a third person to wind up their affairs; and a suit was brought, a quarrel having arisen upon some difference between this third person and Drawbaugh. In that suit Drawbaugh filed an affidavit of defence, *telling the story as I now tell it;* that he worked for them and took lumber from time to time in payment; and that at the end they still owed him $60, and that he got about $75 worth of lumber, and that he was ready to pay that difference.

Bayler was put upon the witness stand, and swore to this story of poverty, of his own knowledge, and that Drawbaugh was always collecting up close. Yet Drawbaugh had signed and sworn to that affidavit only fourteen months before. What do you make of that? Did Bayler mean to tell the Court the truth? Did he know anything about it? Did Drawbaugh keep from his counsel these things, and then help them to put upon the stand a man who swore to a story which he knew was a falsehood? But that is not all: it is not merely that this is a falsehood, — I do not know whether this wretched man is a falsifier or a romancer, or whether he has been subjected to the charms to which so many of these witnesses seem to have been subjected. But that is a further importance in this fact.

Talk about this man's poverty all those years: why, he had only to go to Bayler, a man well off, and ask him for what was owing to him — for the $20 or $30 — and he would have enough to file his caveat. Yet he wanted to persuade you that sometimes he did not know at night where his children's bread was to come from in the morning. That was during the years when he was making these electrical contrivances, — his dial telegraph, and all the other things I have mentioned. He had money in plenty for that; and there was money due to him that Bayler says he never called for. Drawbaugh only wanted $20 or $30 to secure his invention. There was a fortune in it for him if he could only patent it. In four weeks from the day Bayler says he was there, Drawbaugh received $425 in cash upon the winding up of the Faucet Company. He says that he paid $60 of that on a note, — the Leonard note, that is admittedly untrue. He also says that he spent $300 in paying off a bottom mortgage on his house. No such terrible poverty or urgent need for $50 to send to the Patent Office to get a fortune with.

But that is not all yet. He says that the tenant of his house, *Fettrow*, a blacksmith, paid him $110 per year rent. They put Fettrow on the witness stand. Fettrow said that Drawbaugh was poor; that he not only paid him his rent as it became due, but that he did more than that, that he frequently gave it to him in advance; that Drawbaugh and Drawbaugh's wife would frequently come to him and get little sums of money for provisions, etc.; that he would get produce and provisions from his customers and turn it over to them, and charge it up on account of rent. Fettrow says that sometimes at the end of the year, when they settled, he would find that he had overpaid his rent; that sometimes the balance would be one way and sometimes the other. They asked Fettrow to put in his account, showing everything that he did pay Drawbaugh, and he did so. *The accounts do not tell the same story.* From them it appears that there never was a year when Fettrow paid his rent in advance. There was not a time according to his own accounts (which the defendants have printed in their exhibits), there was not a year, in all these years, when the balance at the end of the year was not in Drawbaugh's favor, of from $20 to $60. If he had been so poor as it is pretended, so poor that he did not know where to get food for his family, here was his prompt-paying tenant, ready to advance him the rent faster than it was due, and he could have gone to him and got money at any time. What do you understand by that kind of story? Drawbaugh produced Fettrow to swear to that which was untrue. His own accounts show that his statement is untrue. Why, this case seems to have been presented with that recklessness which ordinarily belongs to this kind of speculation.

Not only that. Fettrow's accounts were put in evidence. The drift of his testimony was that his advances to Drawbaugh were in money or necessaries for his family. That is not true. You have all the items, but a very small part were advances in the way of money or provisions. The bulk of the items were for blacksmith's work for Drawbaugh's customers. He was doing blacksmith work for Drawbaugh, and Drawbaugh was doing machinist's work for him. When he did blacksmith's work for Drawbaugh and charged it to him, of course Drawbaugh got it out of his customers in return. For this Fettrow matter, see our brief, p. 356; app. 100.

Holsinger is another important witness. He was the printer who wrote too many articles for the newspapers for the good of his cause, Of him I have spoken already.

Of *Dr. Moffitt* (brief, 415; app. 143) I also spoke this morning or yesterday. He was a dentist in Harrisburg who went frequently to Drawbaugh's shop, partly for the trout fishing in the vicinity, and partly because of the interest which he took in Drawbaugh's numerous inventions, having known Drawbaugh for twenty years. The story that he tells is that he went to Drawbaugh's shop at one time in the summer of 1873, and there saw a talking machine. He says that he was led there partly by "the interest he took in the various and numerous inventions that Daniel Drawbaugh was experimenting on" (defts, i, 516).

Then we asked him to look at his fourth answer, and to state what were the inventions there referred to; and he answered (p. 522): —

> "Various inventions, I could not state which ones; I was interested in almost any mechanical pursuit the man was working at, being inclined that way myself to some extent."

Of course he would know about telephones there as soon as anybody would know. His story is that he was a visitor to Drawbaugh's shop from some time before 1870, and that he first saw a talking machine there at a date which he says was in the summer of 1873. I will not now discuss whether that statement is true or not; but this friend, interested in his inventions, a frequenter of his shop, never saw one before 1873; and yet the defendants would have your Honor believe that everybody in the community knew six years before that he had this machine in his shop. I will read from his testimony, at page 415 of our brief (defts, i, 517): —

> "*Q.* 13. Do you remember whether Mr. Drawbaugh talked through the instruments at that time?
>
> "*A.* I can't give any definite time when he talked through any of these instruments, whether it was the first time or a short time after; the first time that he talked through them to me was shortly after I had any knowledge of his having a talking machine, when he handed me an instrument similar to this (indicating A), which he directed me to place to my ear, stating that he would go down stairs, or in some other part of the building, and that I should listen. He went, and I heard Mr. Drawbaugh's voice asking me if I heard him talk. 'Do you hear me talk?' was the way he put it. I was surprised, and I looked around, expecting to find Mr. Drawbaugh

behind me, but did not find him. He came in presently, and attempted to explain to me the principle on which the machine operated; I did not understand his explanation; he alluded to the vibration of a bee's wing to illustrate how the diaphragm operated to produce the sound; that is about all that I remember distinctly on that occasion. There was a great deal more said that I do not remember."

Now your Honor, knowing the best that was got from that instrument by the tests in New York, can appreciate the value of such a piece of testimony as that. But that is not all. If the defendants' record proves anything, it proves that that instrument **A** was not made at that time. I think that I have mentioned the impossibility of believing that such a thing existed in the shop of Drawbaugh for six years before this person knew anything about it. He is the man, judging from his own statements, who thought in 1878 that it was no use to go into the telephone business, because Drawbaugh could not antedate Bell. But now he is produced to prove that he always knew of his own personal knowledge that Drawbaugh was years ahead of Bell. He is, I think, on the whole, the most intelligent man of all the witnesses who pretended to have ever listened at one of Drawbaugh's instruments; and that is his testimony with regard to it. What is the value of the less intelligent class?

William H. Zearing is another witness whom I want to refer to (brief, 419; app. 626). He was a witness brought in in the fourth year of the case. He was a neighbor, and there is no reason why his testimony should not have been brought in before. He was secretary of the school board, a fairly intelligent man. He says that he went to Drawbaugh's shop in 1873, 1876 and 1877. Of course the important question is at which of his visits it was that he saw the instrument. He says that the instrument which he saw, and which he heard speech through, was exhibit **I**. He is going to fix just when it was. He states that on Nov. 25, 1873, he went to Drawbaugh's shop in order to get a pair of steelyards repaired. He had a funny experience to begin with. This man Drawbaugh, according to his present statement, was so busy making telephones that he could not stop for anything else. And he never got any work, and he was out of work all the time. But Zearing went there in the fall of 1873 to get his steelyards repaired; and Drawbaugh said that he was so busy that he could not do it, that it would be a fortnight before he could do the job, though it only came to thirty-five cents; that he would have to do it after night, as he had *other work promised*.

In the same year, Hauck was carrying on the business of manufacturing faucets, and Hauck wanted Drawbaugh to work for him, and said that he would give him his own price per day or by the job. Drawbaugh refused, stating that he had so much work to do for other people that he could not (brief, p. 358).

Zearing has an entry in his account book to the effect that on Nov. 25, 1873, he got his steelyards repaired; and he knows that it was at this time that he heard the speaking telephone, because one of the things which he heard through the machine was, "The steelyards are finished." If so, there can be no doubt about the date. He was asked how things were arranged. His testimony was that the receiving instrument was lying on the *middle* of the table, and that he was *standing* up close to the table. Why, he might as well have been in the next township. It is physically impossible that he could have heard speech through it as he testifies, as much so as to make my voice heard in Kamschatka. It is absolutely, ludicrously impossible. He could not have heard with the instrument lying on the table as he states it was. Think for a moment of these tests which were made in New York by Mr. Benjamin; shut up in a tight closet with the receiver at his ear, yet unable to hear a single sentence. Yet this witness says that while he was standing up by the table on which the instrument was lying he was able to hear distinctly the words, "The steelyards are ready." We have specifically proved that it is impossible (complts, ii, 1377).

Jesse Eicholtz (brief, 421; app. 629). He was a miller, living in the neighborhood, five or six miles away from Drawbaugh's. He says that he went to Drawbaugh's shop on the 13th of November, 1873, to get a piece of machinery that Drawbaugh was making for him; and he knows that it was on that day, because he has an entry in his book about the machinery. His wife went with him. They talked through the talking machine, and heard and understood perfectly well. Well, he got into one little trouble. In giving his direct testimony in describing his visit, he said that when he and his wife drove away on that day, "John Teahl rode along with me that day from Teahl's mill, where he was milling at the time." Now, the fact is that John Teahl had sold his mill two and a half years before, and had moved away from that part of the country. Not only had he quit milling, but he had left the country, and did not live anywhere near there. This man's power of association does not seem to be first rate. His deposition proves as absolute impossibility just as readily as it proves the existence of the telephone. On cross-examination we were able to get from him some further particulars. He said that when they first talked, the machinery was not running, that afterwards Drawbaugh started the wheel and the machinery to satisfy them that they could hear perfectly well in spite of the noise, and that they did. That was certainly a recommendation for that instrument. That cannot be done now. In their tests with the instrument in New York, there were horse-cars in the middle of a wide street, and the listener shut up in a closet in the middle of a building, but a passing horse-car sometimes drowned the voice. Then we asked the witness whether he told the defendants' counsel this little anecdote about starting up the mill. "Yes." But they did not bring it out. It was a little too strong for them, I presume.

Mrs. Eicholtz went on the stand to sustain her husband's testimony. When she came to be cross-examined, we asked her whether she had ever heard any talk about the machine before she went there, and she answered, "Yes; her husband talked about it; he had been there before." It looked rather curious that the defendants did not ask the husband about the other visit. So they had to recall the husband for that purpose. He said, "Yes, he had been there in 1871, and talked through the machine and understood." Had he told defendants' counsel of this earlier visit? Yes. But they had not brought it out. By and by he said, just as he was leaving the witness stand (defts, iii, 162): —

> "As to that first visit, I would say that that first talking machine was entirely different from the second. The first consisted of a tin can and a glass tumbler. They were connected by a string; if I mistake not, it was a string instead of a wire. The second was connected by wire. That is my recollection; but it has been so long since that I wouldn't positively swear that it was a string or a wire, but I think it was a string."

The pair of telephones he saw in 1871 *were connected by a string.* He is not perfectly positive of that, but that is his recollection. If that is his recollection and his testimony, then which side is he on? Do you want to keep one part of his deposition, and not the other? Do you want the 1873 part, and not the 1871 part? What will you do with it?

There is more about this string-telephone business. One of their witnesses, *David M. Ditlow,* said that he went there in 1873 or 1874, and talked through an instrument. What was it? He said it was composed of two tin tubes with bladders over them. The tin tubes, at the end of which were the bladder, was connected by wire, wrapped with string. Then Drawbaugh testified that he thought the witness had meant to refer to the tin can **B**. But **B** is not the telephone which the witness describes. What is the trouble? Has he mistaken another instrument for that? The witness did not think he had. He testified that he had looked at the exhibits in the case, but could not recognize it. It was not because he had forgotten what he had seen, but because what he had seen is not among the exhibits produced. (Brief, p. 313; app. 187.)

Again in the course of the case, we called, for another purpose, a witness by the name of *Eppler;* we did not call him about telephones, but merely to prove the date of a collateral matter. The defendants had been to see him before we had seen him. They had talked with him about telephones before we saw him the first time, to learn if he had any knowledge on the subject. He was not a man whose residence or position naturally gave him any knowledge, as he lived some miles away. They had been to see him; they talked with him. Their counsel went to see him twice after we had seen him. Both parties had been to see him several times. We put him on the stand and had him swear to other matters, for the purpose of fixing another date. Then the defendants asked him whether he did not tell the complainants that he had been to Eberly's Mills, and to the shop there, and had seen a telephone or talking machine there; and whether the man at the shop was not Drawbaugh, and whether he did not tell the complainants' counsel all about this. Had he not only told the complainants this story, so that the complainants knew of it and were apprised of it; but had he not told the defendants so that they knew it, and had he not told them that he visited the village in 1872 or 1873, and then saw this talking machine. He said that he told them about it, but had not told them that it was in 1872; that he had not told them that he was there in 1872; that he told them he did not *know* positively when it was, but that his recollection was that it was in 1873 or 1874. They kept putting it in their questions whether it was not 1872–73.

To make a short story of it, — not altogether creditable to us, *if true*, — they created an appearance as if we had one witness who had been there at Eberly's Mills in 1873, and had seen a talking machine. We knew the truth, and so when we came to re-examine him we asked him the question and developed this state of facts. That he did go there at some time or other, that he went to a wagon maker's shop, not Daniel Drawbaugh's shop, but to that of his brother, John Drawbaugh, and *that what he saw there was a string telephone*, and that *he went home and made one like it*. Now that is a pretty important fact in this case. The defendants put it in. They made him their witness when they began to examine him about it. They brought it out, *but with a false color*. They had talked with him, and knew what he was to say. Moreover, they knew all the actual facts, as we did not. This took place at the shop of their own witness, their man's brother, across the road from their man's house, in that village, and they put in as a fact that this witness went there at some time in 1872, 1873 or 1874, and saw a talking machine there in that village; but it *turns out to have been a string telephone. They did not call John Drawbaugh, in whose shop they saw it, to deny or dispute this statement or to contradict Eppler, and there his testimony stands.* Now, when we find that their witness Eicholtz says that when he went there it was a string telephone, according to his recollection; when *they* say, and ask the Court to believe, that Eppler saw a talking machine, that there was an instrument there in 1872–3, and it turns out to have been only a string telephone, — *and they know what the fact is and do not contradict this*, — then there is a good deal of help towards an understanding of the case. For this string-telephone matter, see brief, p. 311.

H. B. Musser (brief, 424; app. 87). He is a farmer of the neighborhood, and as intelligent as those farmers ordinarily are. He says that he went to Drawbaugh's shop in the summer, in the last of June, 1874, to get some repairs to his mower. He fixes the dates very exactly. He went again in the summer of 1876 to get his mower repaired; he went again in 1877 for the same purpose. He says that upon two of these occasions he saw the talking machine, and had talks through it. It is pretty material to know when this was. If it was in the summers of 1876 and 1877, then his testimony is not very troublesome. He swears that in June, 1874, he saw the tumbler **F**, and tin can **B**, and talked through them, and heard perfectly well. He says that in 1876 he saw the two little magnetos **D** and **E**, and talked through them. Whether he saw telephones on the first or second or third visit, at each of which he had the reaper repaired, is a matter of mere memory. On direct examination he undertook to state how the instruments were arranged, not in the same room, but one instrument in one room, with a wire running through two partitions and an intervening entry way to a receiver in another room. I asked him to draw a plan of the way the rooms were arranged, and he did it. Between the two rooms, as indicated in the plan which he drew, there is an entry way six feet wide. The first arrangement of partitions which had an entry way between the two rooms did not exist until 1875, and remained until 1878. It is certain, therefore, that his visit was not until after 1875. He made no visits between June, 1874, and June, 1876; thus the most he can prove is that the tumbler and tin can were the best instruments in the summer of 1876, — then, or at some time after that, for when once his association is broken, there is nothing to anchor to.

But that is not all. The witness undertook to describe the clocks that he saw there. We know when the clocks were made, from Drawbaugh's statement and from the testimony of his own witnesses. Musser says that he then saw these fine clocks, *which did not exist until* 1877 *or* 1878; he says that he saw them at the same visit when he saw the talking machine **F** and **B**, which he talked through.

W. H. Decker (brief, 425; app. 251) says that he went to Drawbaugh's shop in 1873, 1874, 1875 and 1877, and that he saw these instruments. He says that the shop was lined with them. It may be that they were not all talking machines, but, according to his story, he there saw more talking machines than all the exhibits put together would number. His testimony, if your Honor pays any attention to it, must be read and examined pretty thoroughly. I will not stop to do that now, and will state only one thing in connection with it. He says that he went there and talked through this contrivance in the summer of 1874; but he made a mistake, and rather a serious mistake. He says that in the summer of 1874 the instrument that he talked through was exhibit **D**. Now, there is no pretence that **D** was then made; on the contrary, the defendants expressly assert that it was not. This date, therefore, was too early. He had desired to fix the time early enough, but he fixed it too early. Next he says that in August, 1875, he saw and had a conversation through one of the machines; and as to this he testifies (defts, ii, 1155): —

> "*Q.* 33. State what you remember of it.
>
> "*A.* 'How is my old friend Jacob May and his family?' he says. I said, 'They were all well when I last saw them.' He says, 'I understand there is an increase in the family.' I told him I wasn't positive of that, and couldn't give him no positive answer. He says, 'Well, they are all well, so far as you know?' I said, 'Yes, sir.' He said, 'I am much obliged.'"

That increase did not happen until a year afterwards. There was no increase between March, 1872, and August, 1876, when the event which they inquired about happened. We called Mr. May, and by him proved that fact.

I beg your Honor to understand that if I do not go through all this testimony, it is because life is not long enough, and not because I think it of no importance to examine it.

Urias R. Nichols (brief, 429; app. 27) is rather an interesting witness. He was a soldier. He had been a machinist. He was in the signal service at one time. At another time he was assistant keeper of a lighthouse. He is a farmer at the present time, and has been for a number of years. He says that he went to Drawbaugh's shop in January, 1875, and that he then saw this instrument, exhibit **A**, and heard and understood what was said through it; that it repeated speech perfectly; that it was a perfectly admirable thing. He says that the boy who was talking with him through the instrument was Drawbaugh's boy, as nearly as he could make out; that he called Drawbaugh "father." Now, Drawbaugh's oldest boy was only eight years old at this time, rather small to take one of these instruments which have baffled the experts in New York, and talk whole sentences through it. Nichols came there, according to his statement, in January, 1875, and the date he gave appeared to fit in first rate with other circumstances. Just before him they called D. W. Smith, who testified that he was in Drawbaugh's shop in November, 1874, and that Drawbaugh was then making this instrument, exhibit A. Nichols says that when he went there in January, 1875, he saw this same instrument, and says that Drawbaugh told him that it was about sixty days old. Thus the statement of Smith that he was in Drawbaugh's shop in November, 1874, and saw him making this instrument, and the statement of Nichols that he was there and saw it in use in January, and was then told that it was about sixty days old, fit in as nicely as possible. Nichols apparently fixes the date exactly, and says that he knows that that was the time, because he came to Harrisburg to see a member of the Legislature about some business. Then he says that he knows that was the date, because he then bought some lime at Hake's lime kiln in that vicinity. His way to and from the lime kiln was by Drawbaugh's shop. He remembers that he bought some lime, and said that he had a memorandum at home showing that it was delivered on the 18th of January, 1875. He forgot to bring the memorandum with him, but he had no doubt about it.

We called Hake's lime burner, Henry Kintz, and he brought his books. He was the lime burner at Hake's for many years, and up to April, 1876, and sold all the lime; and he proved that he never sold that man a pound of lime. They did not call Nichols back to explain that, nor to produce the "left at home" memorandum.

On cross-examination we asked Nichols what he went there for. He replied that he went there to see the clocks. He said that he had read about them in a Harrisburg newspaper of two or three months before, and read that they were run by electricity from the earth, and required no winding. The defendants tried to get him to back out of that, for *no such account was contained in any Harrisburg newspaper, or in any other paper, until January*, 1878. He then said that possibly it might not have been a Harrisburg newspaper, but that he was pretty positive that it was, because he did not read any other. But the first account of the clocks in the Harrisburg newspaper, as I have stated, was in February, 1878; and this man says that he never was in Drawbaugh's shop but once.

He was then asked, on cross-examination, who he told about it when he went away; and he said that he mentioned it to Col. Maish, a lawyer of York and a member of Congress. Col. Maish says that Nichols did tell him that he had seen a telephone and an electric clock at Drawbaugh's, but also testified that he had previously talked through a Bell telephone in Washington, with Mr. Robeson and Mr. Blaine, in the fall of 1877. They did not call Nichols back to explain that discrepancy.

What do you make out of that story? There is no doubt about the time that he went there. We fix that absolutely as the spring of 1878. He swears that this telephone **A** was then about sixty days old. That fact is an end of the case, if it be a fact, for **D** and **E** were made after **A**. What will you do about the man's testimony? If he is worth anything as a witness, if he is not a liar, if he has not been stuffed up with this story, the dates and circumstances of which fit together so nicely, then what explanation can you give? Did such a thing take place? Drawbaugh put him on the stand, and he swore that Drawbaugh told him that that thing was then sixty days old. Now that we know the true date of that visit, what reply can you make to that? They have not called him back; they have offered no explanation of the testimony. What then will you do about it? That witness did not make a mistake. A misconception is not conceivable. He says that he was told that the instrument was then sixty days old. A man would not imagine such a statement as that unless it were true, or unless it were said to him, had been told to him, and stuffed into him. I don't care which horn of the dilemma they take. One is fatal to their case, and the other is fatal to their character.

Updegraff (brief, 432; app. 247) is the next fellow I want to call your attention to. He says that he went there twice in the spring of 1875, and heard through a talking instrument; but he cannot identify which one it was. He says that he went there twice about a month apart, in the spring of 1875, and that he never was there after that time. Updegraff is a quack doctor. At that time he was an oculist; at the present time when he testified, he was selling seashells; between times he had made hats and magic lanterns. He never was there after that spring he says. He was there in 1874, also, he said. He fixes the time by saying that he went to visit a patient; and that he had the charge for it in his book; he meant to have brought the book but he forgot it. He lived in Philadelphia, and came up from Philadelphia to Harrisburg to testify.

It turned out on cross-examination that defendants' counsel had seen his book and had examined it a half dozen times. It looked rather curious after that that it should not be produced. I do not mean to cast any imputation upon the counsel, but it certainly rather shook the value of the testimony of this witness that under such circumstances it was not produced. Then he said that he could fix the time by the horse that he hired at a livery stable; that he had asked the livery-stable keeper to look at his book, and that he had done so, and had told him that it was in 1875. But they did not produce the book or call the livery-stable keeper, nor any witness to testify who had seen the book; Updegraff had not seen it. Well, that testimony looked pretty weak under those circumstances. Then he said that on that expedition they went to Zacharias's Mill and went fishing in the stream, and that Zacharias's Mill was four or five miles above Eberly's Mills, where Drawbaugh's shop was. He rather thought that Zacharias did not own the mill, but was the miller. He says that they camped there the first night. "The next day they put their boat in the river and floated down to Eberly's Mills. They pitched their tent on a little island at Eberly's Mills in the creek, and fished there till evening." He says that in the evening he went into the shop and talked through the talking machine.

He says that he only knows that Zacharias was the man who ran the mill a few miles above Drawbaugh's, or attended to it. Now, that man Zacharias was called as a witness, and he swore that he did not go to that mill until 1876. What will you do about that? But that is not all. The companion of this man, a person by the name of John T. Smith, was brought to support him. He testified in the same way, but a little more fully. He says that in the morning, after sleeping there that night, he went up to the village grocery store and bought some coffee, and something to eat for breakfast, and then came back and had breakfast. Now, it has been brought out by the defendants in their evidence, that that village store was blown up by an explosion of gunpowder in January, 1875, and was not rebuilt until the autumn of 1875, and that there was no store there in the spring of 1875. One gets a good deal perplexed by such testimony. One fails to place any reliance on that sort of testimony from that sort of witnesses. If you had them piled up as high as the court room would hold, it would not make that perfect freedom from every reasonable doubt which must be resolved against the claimant — that freedom from inconsistency — and which is required in this case more than in any which was ever heard of, to make your Honor believe that **F** and **B**, the tumbler and the tin can, gave perfect speech. That is the problem the defendants have got before them.

I do not mean to say that all their witnesses are of that kind, but lots of them are. But I have not gone through with all. Suppose you found one in ten or one in five of that class: what will you say about the rest? The happy accident that we got from Nichols the statement that he went there to see the clock in consequence of reading of it in the newspapers, settled his business. It was a mere accident that he made that statement which disproved his evidence. How can you know whom to believe? How can you place any confidence in the testimony of witnesses who are contradicted in that way; or how can you place any confidence in testimony as to dates, which exist only in the memory of the witnesses. It is all memory, memory, memory, — not a paper, not a line, before our patent, *except the advertising card.*

Abraham Fisher (brief, 373; app. 233) is another witness who is produced, a pretty interesting and rather an important one. He did not hear Drawbaugh speak through a machine. He says that he went there twice: the second visit is the important one. He went there in the summer of 1873; he is sure that that is the time, and that Drawbaugh then showed an instrument. He is not perfectly positive that this **A** is the instrument, but he has no doubt about it. This is fixing the date pretty early; for the instrument did not exist, according to their story, at that time.

Possibly they may try to stretch it back to that time chiefly by this witness, but that is not the tenor of their depositions. Fisher knew that was the time, because he bought a hydraulic ram at that time, and had an entry at home and had looked at the entry the night before he came, but he too had forgotten to bring the paper with him. But it so happened that afterwards we find in the faucet interference case that Drawbaugh had produced a memorandum book, and part of it was copied into the faucet interference, and in that book was an entry of a charge to Fisher of $63.57, under date of June 7, 1873, for this very hydraulic ram; and Drawbaugh testified in that case that that was an entry for a ram sold to Fisher, and that the entry was made at the time he sold it. When Drawbaugh was on the stand on cross-examination, we asked him if Fisher had bought two rams. No, only one ram, and Fisher was wrong in his date; and it was in June, 1873, when he sold him the ram. Fisher had said that he had fixed the date by an entry which he had at home; and so we wrote to Fisher and asked him to send us a copy of the memorandum which he had; he did not send it, but he said that it was all right. And he was sure about the date; he had talked it over with his folks. We wrote again, but he would not send a copy of the memorandum, but said he had talked it over again with his folks, and that it was in 1874; of that he was sure. Well, things began to look very curious. After Drawbaugh had testified to this, and had, by his own written memorandum, made by himself at the time, shoved the ram over to 1873, it began to look bad for Fisher. So they called Fisher back again, and he said in substance, "Yes, it was in 1873, come to look it over, that I was there. My memorandum was not a memorandum as to the purchase of the ram, but my recollection was that I bought the ram at the time that Jacobs worked for me, and Jacobs worked for me, according to my books, in 1874. When I got complainants' counsel's letter, I looked it over and talked it over with my neighbor. He said, 'That ram was put in when Jacobs worked for you,' and Jacobs worked for me in 1874."

Another neighbor said, "I put in the pipe for that ram, and I know I quarried stone for Abraham Smith in 1874, and it appears to me it was the year before"; and another said, "he knew it was in 1873, because it was a year before he lived in such a house," and Fisher talked to his wife about it, and she says, 'Don't you remember

Jacobs's family worked for us two years in 1873 and 1874 both?" So Fisher remembered that, and then remembered that in 1873 he paid them every Saturday night and kept no account of it on his books. Just so.

Now, I want to read to your Honor an authority which bears on a case like this. There was a case of *Woodman* v. *Stimpson* (3 Fish. 98), before Judge Lowell, and a witness in that case undertook to settle a question of date, as between 1860 and 1861, by association with some event. Either it was 1860 years after the Christian era, or it was some other event. In that case Judge Lowell, with his grim sense of humor, said (p. 10): —

> "The value of these aids to recollection depends upon two or three circumstances; on the importance of the event itself, primarily, and next on the closeness of its connection or association with the fact it is adduced to support. If Mr. Perkins tells you, 'I enlisted at such a time, and I did this job immediately before I went,' there is a natural connection between the events, and he would be likely to remember them. If he went to the war, and knew that he did this job just before he went, he would be pretty likely to remember it. If he had not been to the war, and had been doing jobs for the defendant all along, it would be difficult for him to recollect in what year he did do it. You ask a farmer in what year he saw a new plough which his neighbor was using, but which he did not think much of, and which he did not think worth while to buy. His neighbor is dead now, and you want to know when that plough was first used. Well, he thinks it was the year he had a certain field sowed with rye. His wife thinks it was the year he had it sowed with barley. His head man thinks it was the year he had it sowed with clover. They talk it over and finally settle that it was the barley year; they do not recollect the time, but that is the best they can do, and you have to take it with that qualification."

What weight can we give to the testimony of witnesses as to dates which are fixed by such associations? And especially after these matters have been talked over by the witnesses amongst themselves in the way in which it has been done in this case? Why, sir, this case and this testimony are the interest and the talk of that whole community. The people in that little village of seventy-five inhabitants are talking of this case and of nothing else. They sit around in the evenings at the grocery store, and the post-office, and they talk about it. They finally agree as to certain dates and facts.

They say, "This thing was done about so; and if we can get the Court to ratify the action of this caucus, it will be a pretty good thing for our neighbor Drawbaugh. If he can get $500,000 to bring to this village, we would like him to do it. He is a good fellow whose money does not stick by him, and we would like to do him a good turn. It is, therefore, the opinion of this caucus that he had a talking machine, and that we all knew of it, and understood all about it perfectly well."

They called one witness of a different stamp. That was *Prof. S. B. Heiges* (brief, 270; app. 622). I wish they had two or three like him. It would save us much trouble in arguing this case. Prof. Heiges is now the principal of the State Normal School at Shippensburg, twenty or thirty miles from Eberly's Mills. He was formerly professor of physics in the academy at York; and was also the superintendent of public instruction in the county of York. At one time, about 1859, he taught school at Eberly's Mills. He not only taught school during the day, but in the evening he had a class to which he gave instruction in physics, especially in electricity and magnetism, by lectures and experiments. Mr. Drawbaugh attended those lectures with a good deal of interest, and Heiges and Drawbaugh talked a good deal about these things. Drawbaugh told him that a clock could be made which would run by means of magnetic currents from the earth, and without winding. This is what Heiges says. He might have told him that it had been made ten or a dozen years before, and was a perfectly well-known thing.

It is a little doubtful, however, whether Drawbaugh did tell him that. For, when you look at Drawbaugh's cross-examination, you will see that when he speaks about a clock which could be run by electrical currents from the earth, and without an ordinary battery, it seems to me that the meaning is that that plan had occurred to him in consequence of some previous experiments in swinging a pendulum by a battery, which were made in 1867 that is the year when he moved his shop (defts, ii, p. 938, x 828); and it appears to me that Prof. Heiges got two things mixed up, — some old talk about something else with Drawbaugh's clock of a much later period, — and that he has blended subsequently acquired information with prior knowledge. He says that Drawbaugh told him at that time that the time would come when they would talk by telegraph, though he did not tell him how. It was nothing remarkable to say that.

Mr. Heiges says that the next time he went to Drawbaugh's shop, after this, Drawbaugh showed him an instrument. The date of this he does not exactly fix, but the circumstances he names are intended to point to July, 1872. He says that he was then staying with his father-in-law at Shiremanstown, about three or four miles from Drawbaugh's shop; and that he went one day while he was staying there, with his brother-in-law, Dr. Mosser, down to Drawbaugh's shop. Dr. Mosser was a partner with Drawbaugh in the Faucet Company. Dr. Mosser and he went down one Sunday forenoon to find Drawbaugh, and have a talk about faucets; and they were there three quarters of an hour talking about them, and while there, Mr. Heiges was looking around the shop, not taking any particular part in the talk. Just as they were coming out — so Prof. Heiges says — something was said about the telephone, and Prof. Heiges saw something which he thinks was the instrument **C**. It does not appear whether Heiges first asked what it was, or whether Drawbaugh first called his attention to it; but the consequence of what was said was that Prof. Heiges took into his hand something which he says is **C**; he says that Drawbaugh said that it was a talking machine. But let me read to you his testimony about it (defts, iii, surrbtl, 99): —

> " *Q.* While you were there at Mr. Drawbaugh's shop with Dr. Mosser on that occasion, did Mr. Drawbaugh say anything to you about an invention of his; and if so, what invention?
>
> " *A.* Yes, sir; he spoke of and exhibited to me his talking machine, as he called it."

Now, that man ought to be a very important witness. If there is anything in this business, he is the man to find it out, and he will know everything about it, — how the machine talks, and the whole operation. He is the only man who ever went into that shop with the education — intellectual capacity — to understand the mode of operation and the structure of this thing. He ought to know everything about it.

> " *Q.* 31. Did he talk through it to you?
>
> " *A.* No, sir.

" *Q.* 32. Did he, at that time, make any statement to you about it having been talked through by himself or others, or not?

" *A.* He did, and said that he had talked through it, and some other parties had."

The machine which they had in there when that conversation was going on is this machine, exhibit **C**, which, with possibly one exception no witness in the case testifies to the use of. Not a witness testifies to any knowledge of any attempt to use that instrument before the day when this man says that he went there. So that part of the story is not true. There is something mixed up there.

" *Q.* 33. Did he say whether or not, when he and others had talked through it, it had operated so that the talk could be heard through it?

"[*Objected to, etc.*]

"*A.* Yes, sir, he did; he said that it had so operated."

This man is a professor of physics, and yet they have to lead him like an infant.

" *Q.* 34. Will you please look at the machines now shown you, marked **A**, **B**, **C**, **F** and **I**, and state whether you recognize among them anything that you saw at Mr. Drawbaugh's shop, at the visit when you and Dr. Mosser were there together?

" *A.* This is one that I saw [*taking up instrument* **C**].

" *Q.* 35. How long, on that occasion, did Mr. Drawbaugh talk to you about his talking-machine invention?

" *A.* I suppose not more than five minutes; our conversation occurred after Dr. Mosser and he were through.

" *Q.* 36. Did you take the talking machine in your hand at that time or not?

" *A.* I did. I remember I caused the diaphragm to vibrate just as I do now, by placing my finger against it and pressing it in.

" *Q.* 37. What kind of a diaphragm was on the machine at that time — metal, or wood, or membrane, or what?"

Why did they ask him such a question as that, except for the purpose of leading him?

" *A.* A metal diaphragm.

" *Q.* 38. Did Mr. Drawbaugh say anything at that time about how the sound of the voice operated the machine? If so, what, so far as you remember?"

Now, there is a question which will draw out the whole thing.

" *A.* Yes, sir; I remember he said the voice produced pulsations."

Pulsations! That is not a description of the mode of operation. What kind of pulsations? That is not what they wanted of that witness. They have not brought a man like him merely to testify that this thing is operated by pulsations. A string telephone does that; they must get electricity into it.

"*Q.* 39. Did he, or did he not, make any reference to the use of a magnet in connection with the machine?
"*A.* Yes, sir; he spoke of applying both magnetism and electricity."

An electric speaking telegraph was one of the wonders of the world. It was then one of the unperformed miracles, the impossibilities of the world. Speech had been transmitted by speaking tubes, but to transmit speech by electricity was the wonder of the world when Bell accomplished it; yet when this professor of physics is asked how it operated he does not mention electricity! When a vigorous leading question is thrust at him all he says is, "he spoke of applying electricity." When; in the future? "Spoke of applying electricity"; this about a thing which, if it is what they allege, rested in nothing except electricity! Why, if the man had a string telephone, working by pulsations, and had a vague fancy that somehow or other — he had no notion how — electricity might be applied, he would naturally enough use such language. But to so speak of that which was nothing unless electric, — there is something wrong here.

"*Q.* 40. Are you able to say whether there was or was not, at that time, a small electro-magnet, with its poles in close proximity to the armature of the diaphragm?
"*A.* I am not able to say whether there was or whether there was not."

An electro-magnetic telephone is alleged; a professor of physics sees it; "really I cannot say whether there was a magnet on it or not."

His recollection became better in the course of the examination. Then we put the instrument into his hands and asked him: —

"*X Q.* 51. When you saw the instrument C at Mr. Drawbaugh's shop, was it in the same condition it is in now, and if not, what were the differences?
"*A.* As I remember it, it was in the same condition as now, but not so much soiled, and did not have the writing upon it, which I presume has been put upon it by the examiner."

On examining it carefully, his recollection is so good that he notices dirt and marks which were not there twelve years ago, he thinks, but with so sharp a memory his recollection is that it was the same then as now, — *and there is now neither electro-magnet nor permanent magnet.* Why, if this were one of the farming witnesses, I should say that the whole story was the mere wantonness of ignorance and romancing — or dishonesty. But in his case it becomes very fatal for the defence· Is it possible that that man, that professor of physics, should have gone there and that brief conversation taken place about such an instrument as this, if it was what they now allege, and nothing more be said? Is it possible that Drawbaugh would let him go away without saying anything more about it than that? That one man of this long list of witnesses was the only one who possessed the intelligence which would have enabled him to answer the questions and to give the information which your Honor wants. The most he does is to load the defence with another impossibility.

But that is not all. That man went there to his father-in-law's several times a year, for ten years after that, yet never had the curiosity to go over to Drawbaugh's shop to see that thing again. He was in the village again, but he thinks he was never in the shop. He never had the curiosity to go and see it. That is all the effect that it had on him. He says that afterwards, after the speaking telephone became known, he told some of his classes about it. He does not say what he told them about it.

> "*Q.* 46. When you first learned of the speaking telephone coming into public use in this country, can you state whether you, at that time, remembered and spoke of the fact of your having seen an electric or magnetic talking machine long prior?
>
> "*A.* Yes, sir; I referred to this instrument incidentally in class; and, if I mistake not, publicly at Gettysburg, at the Teachers' Convention, in connection with the instrument used to represent sound by flashes of reflected light."

They do not tell us just what he did say. What did he tell his class? What did he tell them this machine was? Did he tell them it was a talking machine? He did not know that. He had never tried it, and had never asked to try it. He only saw one end of the apparatus, and never saw it connected. If their statement of it is true, that C is a thing which was always ready to talk, all that you had to do was to attach the wires to it and it would talk right off;

and yet, did that professor of physics say to his class, "Gentlemen, I want to teach you to observe, as a student of physics should observe; whenever the first talking machine in the universe is shown to you, just ask the man if it works by pulsations; don't even notice whether it has a magnet, or rather conclude that it has not, and then lay it down and go away and don't you ever go near it again"?

That is the effect which such an instrument as Drawbaugh had — whatever it was and whenever it was, sworn to be in that condition at his shop, — had on a professor of physics; a man who was an old friend and to whom he had prophesied ten or a dozen years before, who went and spent his pleasure vacations in that neighborhood several times a year ever since, and yet he never went to see and never had handled that instrument. There was no machine that would talk there; he did not believe that there was.

It is a little curious that to Kiefer, to Wilson, to Weaver, the patent solicitor, Drawbaugh never mentioned his telephone. But he gets all these rustics to say he showed it to them. He didn't show it even to his partners; he didn't show it to his workmen in the shop; the professor of physics gets into his shop and he manages it so adroitly that that professor of physics gets out without any information about it, without the test which would prove that it was *not* a talking machine.

And yet he says this invention was disclosed to the public. Certainly that means that he was willing to disclose it. But in fact he never did. If I put a telephone in a box and talk to it, and your Honor listens at the hole in the wall at the other end, you get results, you get speech; you may know that I have got something that I can talk through. But that is no disclosure of the invention. That does not tell anybody how to do it. All that you could so learn, printed and published in a foreign country, would not spoil a patent here.

Such an exhibition does not amount to a disclosure of the invention. Now, no man ever knew what Drawbaugh's invention was. The whole thing, if he had some instruments at the date alleged, depends upon what the structure was and how it worked. There is not a man in existence who had so much as the glimmering of an idea of what their mode of operation was. Here is a professor of physics who sees it, but all that he learns about it is that it is operated by "pulsations"; and he does not know whether there is an electro-magnet connected with it; he does not even know whether there is electricity to it, until he is led up to an answer. Drawbaugh's own nephew says that he made those two instruments under his uncle's direction; and he thinks that he could, from memory, reproduce them. That, within the chain case decided by Judge Blatchford, is not a disclosure to the *public*. More than that, testimony of that sort is worthless. With the greatest desire to believe that nephew, one could not place any confidence in his statements. He is the only man in the world who pretends to have had the slightest knowledge of the structure of these instruments. I do not mean to say that some other man does not say, "I think when I saw this thing it had a magnet to it, and I think I saw some spools on it." But Drawbaugh is the only man that pretends to have a knowledge of the structure that will give the least light to any one.

I am not arguing what the truth is: I am trying to find out what the defendants' record teaches, what it amounts to, where it leaves us, what certainty it inspires.

There is another thing that I want to call attention to. I spoke of the magneto key, which consisted of a large horseshoe magnet placed on a frame and hung in trunnions, and with some spools, an electro-magnet, as near as I can make out placed in this position, at any rate placed on the front end of the permanent horseshoe magnet. Did the witness think he recognized that, by reason of the big magnets and the two spools attached? It is very much the same kind of thing as this big horseshoe magnet with the two spools in "C reproduced." I do not mean to say that they look exactly alike, but there is likeness enough between them for an ignorant countryman to be easily mistaken about them. We know that one of the more intelligent witnesses (Capt. Moore) mixed the talking machine up with the magneto machine. There is much in the evidence to suggest that a good deal of confusion existed with reference to those two machines. (See brief, p. 322.)

[*Adjourned to Sept.* 24, 1884, *at* 10.30 *A. M.*]

Mr. Storrow. Will your Honor please turn to defendants' Vol. I. p. 673. *Wilson N. Miller* was a witness, whose father at one time ran a grist mill at Eberly's Mills. He afterwards had the warehouse at one or two of the neighboring railroad stations, and carried on business that way. The son, Wilson N. Miller, the witness, was keeper of the warehouse at the station nearest Drawbaugh's shop, White Hill station, about a mile from there, and was for a long time the station agent. The defendants called him, under these circumstances, not asking him for any knowledge which he might have acquired, if he could have acquired any, about an alleged talking machine, while his father ran the grist mill in the village in 1872 and 1873, or 1873 and 1874, but asking him for knowledge which he acquired while he was station agent. He was station agent, or employed at the railroad station, from early in 1876 to April, 1878. He said that during that time he acquired some knowledge of a talking machine from Drawbaugh, in this way: Drawbaugh mentioned it, I think he says, once or twice, but he particularly showed it one day; took from his pocket, as he was at the station, an instrument, and, although the witness does not distinctly identify it in terms by examining the instruments on the stand and swearing to it by letter, yet he describes it so as to leave very little doubt that it is the large flat instrument **A**. His description is, "It was a small wooden box, with a tube to it to talk in; as near as I can tell, it was about five or six inches across, and an inch and a half thick." That is the only one which corresponds with that description. It has become interesting to know the date when he saw that. The witness himself does not have any definite recollection of the date. He was asked (page 674, Q. 29): "Referring to the time when Drawbaugh showed you the talking machine, do you recollect whether that was about the time when he first began to live at Mechanicsburg, or not?" Drawbaugh lived at Mechanicsburg from April 1, 1876, to April 1, 1877, and they asked him whether it was during that time. Miller said, "I don't remember."

"*Q*. 30. Referring to the time when you first talked about putting up the line from White Hill to Shiremanstown, do you remember whether that was about the time when he first began to live at Mechanicsburg, or not?

> "*A.* I don't remember; it was in the summer, but I can't remember what month."

He also testified that Drawbaugh suggested to him that his father should put up a line of wire between the two warehouses, a couple of miles apart, along the railroad, and perhaps borrow the use of the telegraph poles for that purpose; and he would furnish a telephone instrument. The witness told him that perhaps he would; but he did not really mean to, and nothing was ever done about it.

His first sight of any talking machine was the exhibition of this instrument to him, this instrument **A**. Now, when was that? The witness, with a very vague recollection, rather thinks that that was between the spring of 1876 and the spring of 1877; but his recollection is extremely vague. I have quoted one answer. There are some others to that effect. He said this on direct examination: —

> "*Q.* 28. Prior to his showing you the instrument at the railroad station, had you ever had any conversation with him about his talking machines?
>
> "*A.* Yes, sir; but I was so little interested that I don't know what it was any more. I might say, that my business there was about some money that he owed my father for coal; in the conversation, I found that he had no money, and I didn't ask him for it."

His first knowledge, then, was at the time when, as he says, he was there at Drawbaugh's shop dunning him for coal procured from the father of the witness, and which Drawbaugh owed him for. After that, the incident of showing him the instrument **A** took place. The witness had nothing but the barest recollection of the instrument. Subsequently, in our evidence in reply, we called that witness, and had him produce his father's books, which were kept in his own handwriting; and from them we proved that that first sale of coal to Drawbaugh was in December, 1876, and that it was only about a dollar; that, subsequently, there was another sale of a dollar or two, and then another sale; then two at the very end of 1877. The whole bill only amounted to about $6, and nothing paid until April, 1878. The first cash payment made was in April, 1878, and was a payment in full. It is perfectly plain, therefore, from the witness's own statement (now that we get the date to fix it by), from his own statement on direct examination, and from the sequence of facts, now that we have nailed those facts by the book, that his first knowledge, acquired when he went to dun for the coal, must have been at least as late as Christmas, or thereabouts, 1876, and apparently after the last coal was sold in December, 1877.

Now, when we find that at some time after that (because that was before this instrument was shown) Drawbaugh was carrying around to show to persons, apparently as the most suitable and best thing that he had, the instrument **A**, it gives us a very good insight as to the dates of those things which are alleged to have been better than **A**, and made afterwards. It gives us a very good insight as to the value of this way of fixing dates. The man says from mere memory, "I think it was about such a time"; but he also says the sequence to be that it was after he had dunned Drawbaugh for coal; and it so happens in this case that we are able to fix that date. After we had called him as a witness for that purpose, and proved that date by him, the defendants, apparently misconceiving or not understanding the purpose of the testimony, called him back again for them, and had him prove that Drawbaugh had paid him two bills — one already had been proved, April 4, 1878, and another of April 6, 1878. But it happened that the bill which we had reference to was a bill for coal sold on *credit;* Miller went to Drawbaugh's shop to dun him for it. The defendants proved that on the same day when the old bill was paid, or the day before, or the day after, he sold $12 worth of coal for cash, paid at the time and not charged. The defendants, according to their brief, seem to have put that in as though we were trying to accuse Drawbaugh of swearing to one sale when there were two made, or of swearing to two sales when there was but one. Your Honor sees the effect, the conclusive effect of those proofs.

Another witness (I cannot call him a witness in the ordinary sense, for he has not appeared on the stand, but he ought to be called one) was a man named *David Stevenson*, now a resident of Harrisburg, a machinist. It appeared in the evidence that he kept a machine shop and a machinists' supply shop, and that he worked for and with the Faucet Company, not as a mechanic in their shop, but as a maker of patterns, or in doing work for them in his own machine shop, in 1867 and 1868, and that he and Drawbaugh had many and intimate relations with each other ever since. He has done work for Drawbaugh, and Drawbaugh got up some pumps and a flue cleaner, etc., for him. They appear to have been partners, or jointly engaged in the manufacture of certain pumps and putting them out. He has been and still is a friend of Drawbaugh's, and at the end of this case he turns up as a man hunting witnesses for the defendants and in their employ. Now, here is a machinist, a machine-shop man, a keeper of a machinists' supply store, having intimate relations with Drawbaugh, having worked for him in his shop and doing work for him in his own, — doing work for each other, — *quasi* partners, jointly interested in making pumps according to some invention of Drawbaugh's (all this given in Drawbaugh's examination), and in the employ of the defendants at the close of his case. If there was a telephone there, he must have known everything about it, but they do not put him upon the witness stand. I do not need to argue the importance of that line of conduct. When you come to read the brief, you will find case after case with comments upon the conclusive effect, under such circumstances, of the failure to call a witness by the party upon whom the burden rests, and upon whom a very heavy burden rests. Brief, p. 269.

Another witness (defts, i, 498) is *William B. Stone;* fifty-four years old; a farmer by occupation, who says that he saw a talking machine at Drawbaugh's shop on the 15th of October, 1871.

" *Q.* 4. How do you fix the date?

" *A.* On that day I went over to George Free's, near White Hill station; I took over a couple of papers of chicken powder; then I went from Mr. Free's down to 'Squire John Drawbaugh's, a brother of Dan Drawbaugh, and from the 'Squire's down to Dan Drawbaugh's factory; he was in the factory.

" *Q.* 5. Did you make, at the time, any written memorandum or book entry of your visit to Mr. Free?

" *A.* Yes.

" *Q.* 6. Will you please produce the book and point out the entry to the examiner, in order that he may copy it on the record?

" *A.* Here it is.

"*The witness produces a book, and points out a memorandum which the examiner copies; as follows :*

"Sold Mr. George Free 2 packages of chicken powder, 25 cts. = 50. Oct. 15, 1871."

"*Q.* 7. Was this entry made in your own handwriting at the time?

"*A.* Yes, sir; in my handwriting."

"[*Objection to the use of the entry in the book unless the book itself is put in evidence. Witness states that there are a few pages containing private entries which he prefers not to exhibit, and by consent, those pages are cut out by the witness and retained by him. The book is then put in evidence by* **Mr. Hill**, *marked on the outside, and also on the page containing the memorandum above referred to, with the words 'Exhibit Stone.'*]"

Here is the book. It is one of Dr. Pierce's memorandum books. It was copyrighted in the year 1876, five years after this man made his entry in it "at the time." That fact, undoubtedly, was a surprise to defendants' counsel, and on the re-direct examination he asked Stone: —

"*Q.* 18. This memorandum book, which I had not examined until during your cross-examination, was not printed until as late as 1876 or 1877; explain how you could make a memorandum in a book in 1871, when the book was not printed for five or six years afterwards?

"*A.* I had an old book that I carried in my pocket for a long while; it had become almost worn out; it was nearly all destroyed and obliterated, that I hardly could read it; I took and copied this out of that book into this.

"*Q.* 19. What has become of that old book?

"*A.* It is all worn out; it may be lying round home somewhere, or leaves of it, but I don't know where it is; my attention was particularly called to this, because this chicken powder, that I sold to Mr. Free, was the first I ever sold; it is my own invention."

Then he says that he did not understand that it was an original entry which was required, but supposed that a copy would do. He came to testify, saw the defendants, and apparently told them that he could fix the date by an entry; they sent him home; he came back the next day, and this is what he produced — an entry, fortunately made in a copyrighted book. It is rather a curious book in some ways. This entry is made right in the middle of the book. Before this entry giving the date 1871, is an entry dated and stating some transactions in February, 1881. This man was examined in June, 1881. Then, after that, are some entries of transactions made in February, 1881. It is, of course, physically possible that he might have entered in the middle of that book, in 1876, something that he copied from an old book, and then in 1881 began again to make entries; but it is a very curious condition of things, and it is a very nice illustration of the value of that kind of witness, who swore as strongly as a man could, to an entry as being made in his own handwriting "*at that time*." I do not know what entries the witness took out of the book as being private memoranda, but here is one entry that he appeared to be willing to leave in, because he was permitted to take out everything that was private: —

> "Emma Stone told Butcher Myers's children that I stole money from her mother. Now I am going to prosecute that case to the bitter end. This was told Butcher Myers's children in the month of February, 1881. You will have to take the consequences for what Emma Stone said. She says her name is Emma Stone; but she is not legitimate, as got by her reputed father."

There is a little more of that sort of literature in there which he was willing to show. That appears to be what he wrote down as being what his neighbors thought of him.

Mr. HILL. He does not say that of himself, but of somebody else.

Mr. STORROW. Let me read some more, in order to be sure.

This is in William B. Stone's book and it is in the same handwriting as the entry which the defendants put in: —

> "Emma Stone has been at Butcher Myers's. You have been telling some one that I took your mother's money; and you also said that I was lying around loafing. You told this to Butcher Myers's children."

That looks as if it referred to the writer of the book.

Mr. HILL. That may be only some report of a conversation.

Mr. STORROW. *Peter C. Zimmerman* (brief, 307; app. 119, 500) says that he knew all about Drawbaugh's telephone from an early time, from 1867 or 1868. In 1871 he saw it. He was intimate with Drawbaugh from childhood; had known him for forty-five years; they were schoolmates together, and lived near each other, only a few miles apart; says he saw **F** and **B** in 1871; never talked through any instrument. It appeared that Drawbaugh and some of the defendants' counsel were at the village where this man lived to see some witnesses, and apparently they met this witness there at that time, during the preparation of the case. Here is a question put to him on direct examination (defts, i, 437):—

> "*Q.* 43. Have you had any talk with them about talking machines since that first visit?
>
> "*A.* I have spoken to Mr. Drawbaugh about it; yes, sir; several times, —talking about the machine and about the idea of vibration, and a certain remark he made to me in conversation; the remark was this, that he heard Mr. Samuel Hertzler's daughter play on the organ probably a quarter of a mile from his place of residence; while she was playing the organ, he took notice that there was a sound of a cut-off in that organ, just like a tap, tap, tap, a cut-off in that sound; being anxious to know what caused it, he went to Samuel Hertzler's, and found a break in the window glass; being loose, it would jar; from that he seen what the cause was of that there sound cutting off like; then he said that that showed him that he was right; that give him an idea that he was right in his study."

That gave him an idea that he was right. *Now, Mr. Hertzler never had an organ until the summer of* 1875.

Henry F. Drawbaugh (defts, i, 414; brief, 395; app. 112, 718) is the brother of Daniel. The story that he told in the summer of 1879, in the faucet interference case, when he was asked whether his brother was a boaster, and what machines he had made and completed, to his own knowledge, your Honor remembers (p. 128, *supra*); and it will take a good witness to do away with the effect of that statement. This same man appears to have been at his brother's shop pretty constantly from a very early period, although he lived some miles away. According to his story, told on the witness stand, his first knowledge of talking machines there was in July, 1872. I will read the question and the answer (defts, i, 415):—

> "*Q.* 10. Please look at the machines now shown you, marked **B** and **F** [tumbler and tin can, the first ones], and state whether you ever saw them before; and if so, when and where you first saw them.
>
> "*A.* I seen them at my brother's shop at the time we was making that cylinder and hoist rigging in 1872."

He had already produced his book and shown that they were making the hoist rigging for his distillery at his brother's shop in August or July, 1872; and he does not allude to nor suggest, directly or indirectly, any earlier knowledge. Now, there is the man's own brother, with no knowledge of this thing, according to his own story (I am not discussing whether it is true or not), until July, 1872. The defendants want your Honor to believe that the whole community had known of it for five years before.

His deposition is of the vaguest kind about every date except that; he don't know when he saw things; he saw them some time, and rather thinks it was about such and such a period, but cannot tell. This date however he is sure about. Apparently after a while it dawned upon the defendants that he made rather a bad story for them. If the Court was to believe this witness and take his testimony, and the picture that he gave them, five years of their story is knocked over. When he went there, the best thing was a tumbler and a tin can, whenever that was. It was the strongest date he fixed; it was the only one he pretended to fix. What do they do? Did they recall Henry Drawbaugh, this brother of the claimant, employed by the defendants in this case to hunt up testimony: did they recall him and ask him to eat his own words? Not quite that. They produced a witness, one McHenry, to say that in 1868 he heard a man by the name of Bricker say, that he had heard Henry Drawbaugh say, that he had seen a talking machine at his brother's shop and had talked through it. Henry Drawbaugh swears that the first of his knowledge was in 1872. They produce a man who says that he heard another man say four years before that he had heard Henry Drawbaugh say that he had talked through a talking machine at his brother's shop. They produced witness after witness, six or eight of them, to say what they heard Henry Drawbaugh tell them about this, six years, or five years, or four years before Henry Drawbaugh, the brother of the claimant, says he knew anything about it. That is rumor, it is only rumor, and it has only the value of gossip. But they expect this Court to believe it; and if this Court does not swallow that as reliable proof, it has got to find that the first five years of the defendants' story is untrue. But this is not all as to the value of that testimony.

Harry Drawbaugh was a man evidently of considerable means. At one time, in 1872 or 1873, he ran a distillery. In 1876–8, he ran a line of railroad cars from Cumberland County to New York, another to Philadelphia, and another to Baltimore. He owned the cars himself. About 1875, 1876 or 1877, his brother Daniel invented another improvement in molasses faucets, and Henry proposed to go into business with him to manufacture them; and he was in such convenient and comfortable circumstances that he proposed to buy a factory to make them in; and he bargained for one near his residence, and would have got it if the parties had not changed their minds and concluded to continue to use it for their own business. There was Daniel, with his brother alongside of him running at one time a distillery, at another time running cars to the three principal seaboard cities of this continent, and then proposing to buy a factory to make molasses faucets; and yet Daniel could not raise $50 or $75 with which to get a patent on his telephone. Well, of course, that had got to be explained away. So they had Henry testify that although he knew all about his brother's machine, and never went to his shop, from 1872 on, without seeing him at work on it, and he himself spent hour after hour assisting Daniel in experiments upon it, yet he really did not believe that there was any money in it; he would have loaned his brother money to support his family, but as for loaning him $50 or $75 for a talking machine, he didn't see any way of getting it back! That he *now* says was his opinion of the talking machine.

Well, it was hard enough to believe that; but the defendants (I don't know whether purposely or not) contradicted that. Brief, 83, 84. They got a man (Egolf), who was a partner of Henry Drawbaugh in the distillery, to testify that, in a conversation with Harry Drawbaugh, he had said that the telegraph was "nothing now no more," and that his brother had invented a talking machine by which persons in different places could talk personally with one another, and that Harry Drawbaugh expressed himself as thinking that this was more wonderful than the telegraph.

Another witness (Graham) says that in 1867 Harry said, "You will see. It will take the place of telegraphing in the next five years."

Another witness (Murphy) says that Harry Drawbaugh said that "It will take the place of telegraphing after a while." This was in 1867.

Bricker says Henry "went on to tell me that as soon as they could get it completed, they were going to use it in place of the telegraph."

North says that in 1869, Henry Drawbaugh said talking machines are "intended to take the place of the telegraph, and be cheaper." (These are in brief, bottom of pp. 83 and 84).

Now, Harry Drawbaugh says that he did not think it of any mortal use in the world, and that is the reason he did not put any money in it. Harry Drawbaugh says, to confirm his opinion that it was of no use, that he asked a telegraph operator if it would be of any use on a telegraph line, and that the operator said, "No; that everybody would overhear what was said, and that telegraphing was so private that it would not be fit to use." Then they got an operator to come and submit to have that question put to him, and he said he might have said something of that kind. Think of this man, with his brother alongside of him, a man of means, proposing to buy and set up a factory to make molasses faucets, who, for ten years, had known that this telephone was going to supersede the telegraph, to take its place, and yet not a cent to put in it!

John B. Drawbaugh (brief, 404; app. 189) was another brother, who lived in the village next to Daniel, and worked in the shop at times. He is a man of the vaguest memory, but, such as it is, he says that the first time his brother ever spoke to him about a talking machine, or showed him one, was about the first part of 1873; and they say that six years before that he had got a perfected machine. Are you going to believe that? He then says, that before that he had worked for the Faucet Company for a year or so, or a considerable time. He says that while working for the Faucet Company, he saw something or other which he understood was a talking machine, or intended for a talking machine, once or twice, lying on the bench; but his brother never spoke to him about it. Then they tried to turn the edge of that by having somebody swear that John disapproved of his brother's experimenting.

If John's story is true, we cannot wonder that he should discourage

Daniel, for even according to John it did not really talk; but John testified that he helped his brother experiment; and the knowledge he had of it, and of the attempts to hear through it, was acquired in that way, when he was assisting his brother to experiment with it. When they talked through the machine he thinks he heard some words, but not all; and thinks it was about 1873–4; and that it was after he began to work for Hauck & Co. in July, 1873; that he only heard "some words, but not all." At last, they closed his deposition by the question, "Your hearing is slightly defective, is it not?" He was testifying ten or a dozen years after the alleged event. Well, that is not quite all. The defendants gave one piece of testimony which is instructive as one of those little things which give an insight. It is the attempt to show that Daniel had a perfectly good talking machine, but that John thought it was not worth anything, even though it was a good machine. John's own testimony is that he never could get anything out of it, except on one occasion, when he got "some words, but not all." Did he think that a talking machine *that talked* was not worth anything? See what he said. Did he think that his brother, having a perfectly good talking machine, could not possibly raise the money to patent it, and that that was the reason that it was not patented? See what he says. He says that in 1873, when Daniel first showed it to him, he said to him (defts, i, 614, cross-answer 102), "Dan, if this is as good and profitable a machine as you represent it to be, *why don't you get it patented?*"

That is the question which your Honor will ask; you have got to answer it for yourself. The brother did not know any reason, if it was as good and profitable a machine as he said it was, why he should not get it patented. What is the use, after that, of saying that everybody knew that it was a good machine? The evidence is — the defendants' record is plenary — that the neighbors said that a talking machine that *would talk* was a profitable machine, and that he said so also. They attempt to make us believe that the reason why he did not get it patented was because he was too poor, that everybody knew that he was too poor; but his brother said, "Why don't you?" His brother knew whether he was too poor or not.

Deafness does not seem to have made any trouble in hearing persons talk through the machine. I have said something about the character of these witnesses; that they were mostly country farmers; but occasionally there is one of apparently higher grade. Such a one was *W. N. Kline* (defts, i, 656). He was forty-four years of age, and an insurance agent; for aught I know he was a life-insurance agent; and he must be a skilful man who can talk a delusion into a life-insurance agent. He has known Drawbaugh since July 12, 1867; and his particular knowledge of talking machines is that, in the spring of 1879, Drawbaugh showed him this machine **P**.

Now we have a man of a better grade than most of the others, a sharp and shrewd insurance agent, testifying, in the spring of 1881, to an incident which took place only two years before. This is the instrument. [*Exhibiting instrument to the Court.*] It is a kind of double-barrelled instrument. *This* part, connected with the short mouthpiece, is a carbon microphone, which will serve as a transmitter. *This*, with the long rubber tube mouthpiece, is a magneto contrivance, which will serve as a receiver to such a transmitter; it has a diaphragm and a magnet, a permanent magnet, at the back of it.

The magneto part is intended as a receiver, and the carbon microphone part as a transmitter. Now, when you place two of those at different stations, and connect the transmitter of this one, in my left hand, the part with the short mouthpiece, with the receiving part of the one at a distant station, you can talk into the transmitting part at one station, and the person at the distant station listens at the receiver of his set. The convenience of this particular arrangement, having the transmitter and receiver mounted on one board, with a long tube to the receiver is, that the operator using it may place the tube at his ear, and his mouth at the transmitter, and thus, without moving his hand or turning his head, he may listen and speak at the same time. This, which Mr. Ott now hands me, is a reproduction of the instrument made recently for the purposes of this case. Drawbaugh never made but one; and in using that one, in experimenting with it, instead of connecting this transmitter with a receiver at the distant station, a corresponding instrument, he ran his wires around the back of the board so as to connect the transmitting part directly with the receiving part only three inches distant; and thus you had a transmitter and receiver on one board three inches apart. You could thus talk into one, and listen at the other, although the line was only three inches long instead of a mile. There is one obvious inconvenience. This tube, and through which you listen at the receiver, is said to have been at one time six or eight feet long; but, of course, even at that distance, the person listening would hear through the air and not through the machine the voice of the person speaking less than six feet off. Moreover, your Honor knows how feeble the best telephones are. You lose from ninety to ninety-five per cent of the sound, even with good telephones. A telephone that will lose only ninety per cent of the sound is very good; one that will lose only ninety-five per cent is called good. A person listening in this way [*illustrating*], even if this tube were six feet long, would of course hear through the open air what was said by a speaker within three or four feet of him, and would fail to hear the much fainter sound which came through the instrument and the tube. They produce one witness, the insurance agent, Kline, and he is the only one, I think, who pretends ever to have heard through that instrument; and this is his testimony. He is speaking of something which occurred in 1879, two years before he testified (defts, i, 656): —

"*Q.* 18. Show us how you used the machine in listening.
"*A.* I took this here [*witness takes up the mouthpiece attached to the free end of the flexible tube*] and put it right to my ear, and he talked into the short tube on the other side of the machine; that is the way I think he did."

So they were separated at most by the length of the tube when it was distended.

"*Q.* Was the flexible tube of the same length as now or not?
"*A.* That I could not say. There was a short one, that he had in the first place; this was first; then I put this to my left ear, and then I could not tell any more what he said; I mean I don't remember the words that he spoke through it; then he put it to my right ear, which is my deaf ear; afterwards he wanted to show it more distinctly, and he took this tube off, and he put a longer one on, — perhaps six or eight feet long, — and I put that to the ear in which I am hard of hearing,"

[which left open his well ear, the one nearest to the speaker as this instrument is arranged], "and he spoke into the other side of the instrument, and said that Harrisburg was situated on the banks of the Susquehanna River; this was on the deaf ear: it was as distinct as could be; that is what makes me remember it, because I had not heard anything in that ear since I was a young man."

That is a sample of the better class of witnesses; but he reeled that off, and did not seem to see in what a position he was putting himself.

I wish to turn back to one thing in Henry Drawbaugh's deposition (defts, i, 419). There has been a great deal of talk in this case by the defendants' witnesses of what they heard Mrs. Drawbaugh say — that Mrs. Drawbaugh said that she wished Dan would stop his experimenting. There has been a great deal of talk of the opposition of his wife to experimenting. It was hearsay talk, all of it, — mere second-hand gossip. *They have not dared to produce her and put her on the stand as a witness;* for she is a perfectly competent witness. Her husband is not even technically a party to the record. They have called witness after witness to say what Mrs. Daniel Drawbaugh said. They called two servant girls out of her household to tell, from a fourteen or seventeen year old memory, what they say they had heard her say; but they have not dared to put her on the stand, although they called three hundred and sixty-six witnesses. They call two servant women, his nephew's wife, and lots of other women, but have not dared to call her. There must have been some reason for not calling her. I think we begin to see from Henry Drawbaugh's deposition what that reason was. He was asked this question (defts, i, 419): —

"*Q.* 46. Did you ever hear your brother Daniel's wife talk about his spending his time experimenting; if so, how often and during what years?"

It was the defendants who put that question. He answered: —

"*A.* I have heard her make mention of it very often *during the year of* 1876 *and from that up, not from that back;* she said she wanted him to stop his fooling and go off; he had good offers to superintend for other firms; and then they would try and live better; they had been living so poor for many years on account of his experimenting.

"*Q.* 47. Did she talk pretty strongly on that subject or not?

"*A.* She did, very."

Was there anything that happened in the world in 1876, which should set experimenting on telephones, a man who took an interest in whatever interested the scientific world? Why, if the defendants' story be true, all those instruments, with two or three trifling exceptions, were finished by midsummer of 1876, or early in the fall. No room for work and experiment on telephones after that high-water mark was reached.

I spoke to your Honor yesterday of the magneto key. Here is a common call key, such as are in commercial use on telephene lines.

It is not his key, but in the essential features of its construction it is not unlike his, and works on the same principle, so that your Honor can understand how his worked. [*Exhibits instrument to the Court.*] There is a large permanent horseshoe magnet. Here, opposite to the end of it, are two coils. These coils are mounted on the end of the magnet. The lower leaf of the magnet is prolonged, and they are mounted on that, and so they become magnetic — deriving their magnetism from that powerful magnet. We have there, in that condition, a powerful magnet, or rather, I should say, an electro-magnet, with two cores, surrounded by coils of fine wire in the usual way, which cores are powerfully magnetized by a heavy permanent magnet. The more heavily magnetized they are the better. We have here an iron armature: the armature rests on top of the cores, and pressing this push-button pulls it away. The movement of that armature will generate a current. This push-button pushes on a lever which carries the armature. It is a familiar contrivance, and has been in use for years. It is not a new idea, but an old one. It is not a very good contrivance; I mean not practically desirable, because it generates one current only, and as it rings by striking a bell, and there is only one stroke, it is rather hard to wake a man up with it. At the present time, they prefer to put a magneto machine on, and turn a crank because it rings the bell more noisily. Instruments of this class have been known for a great many years. The contrivance that Drawbaugh had was not unlike that. It consisted, as I have explained to your Honor, of a heavy horseshoe magnet with an electro-magnet placed in front of it, and that horseshoe magnet was to be rocked. It was a bad contrivance, because the operator had to rock a heavy magnet instead of a light armature as here. Afterwards he modified it so as to keep the heavy magnet steady and rock a smaller one. He had one of that kind, which was to be used for the purpose of fire alarms, and was so advertised. He carried the instrument to Mr. Kiefer, who built the Harrisburg fire alarm, and wanted him to try it. The fire-alarm boxes in the street are not designed to ring a church bell, but simply to signal a man who is supposed to never sleep, in the central office. An instrument of that kind would, he thought, signal a watcher perfectly well, and it would save the expense of furnishing batteries to supply currents to run lines all over the city.

Although it is not a very good contrivance, yet a person who might wish to save the expense of a battery might think it was a very good affair, when used for that purpose. Another of the purposes for which Drawbaugh intended it was that it should ring bells. He describes, in his cross-examination, that he arranged different bells, connected with different magnets, which he proposed to ring by themselves. He was endeavoring, though he never succeeded, and apparently does not know how he ought to have proceeded to do it, so that he could ring one bell or another at his pleasure. He did have one arrangement by which, by changing certain circuit switches, he could ring one bell here or another there. He had this arrangement put up in his workshop, where he was making the experiment. One purpose was to call rooms at a hotel, and to call each room at pleasure.

He had one witness on the stand by the name of Jacob Shettel. Shettel was a nephew of his by marriage. He became one of his partners in the clock company, which started in the spring of 1878. Mr. Shettel was the most active man in starting that company. He had been a farmer, but for many years had owned and operated a thrashing machine, which in that country they take about from farm to farm at the proper season. He was called, among other things, to testify to the machine **H**. He was asked when he saw it (defts, i, 217): —

> "*Q.* 18. Please look at the instrument now shown you, marked ' ,' and state whether you ever saw it before; and if so, when you first saw it, to the best of your recollection.
>
> "*A.* I saw it early in the spring of 1877.
>
> "*Q.* 19. Was it, or was it not there, at Mr. Drawbaugh's shop,

at or prior to the time when you first began to investigate the electric-clock business, with a view to going into it?

"*A.* Yes, sir; it was there in the spring of 1877, the year before we went into the clock business, I saw it.

"*Q.* 20. Did you hear any conversation through it, at that time?

"*A.* Not any conversation; he rang the bell attached to it; that was all that he did to it.

"*Q.* 21. Did he tell you what it was for?

"*A.* Yes, sir; he told me what it could be used for, *for giving alarms and calling at rooms of hotels.*

"*Q.* 22. Did he tell you what the machine **H** was; what name did he give it?

"*A.* I don't remember that he gave it any name.

"*Q.* 23. Did he speak of its being a talking machine or not?

"[*Objected to.*]

"*A.* I don't remember that he said anything about its being a talking machine.

"*Q.* 24. Did you understand at the time whether it was a talking machine or not?

"*A.* *I don't know as I did;* there was very little explanation of that instrument that he gave to me at that time."

Now, is it not plain beyond question that, while offered as swearing to a talking machine, this man's memory is that Drawbaugh showed him something which looked like **H**, which rang a bell, and which Drawbaugh said was to be used for calling rooms at a hotel; but that he did not try to talk through it, and did not say that it was a talking machine. It is as plain as can be that he mixed up the alarm bell which he did see, with that instrument which he did not see, because as we believe it did not exist at that time. We believe it was made two or three years afterwards. That witness is one of their more intelligent men. He is familiar with machinery, and making his living by owning and running a thrashing machine. He was enterprising enough to go into the manufacture of electric clocks. And yet that is the best testimony that that witness can give. Other witnesses were not mechanics, but mere laborers. They have not the intelligence to give the description which destroyed him; how much can you trust them?

But there is a little more about this man that I wish to state. He was, as I said, in these relations with Drawbaugh. In the spring of 1877, they began negotiations about going into the clock business, and Mr. Shettel got his two brothers-in-law — the Grissingers — to join him and become partners in the clock. Now Shettel's testimony is that Drawbaugh never said a word to him or made any application to him to put money into the telephone; nor did he ever hear Drawbaugh say anything about trying to patent it. I will read from his testimony (defts, i, 216) : —

> " *Q*. 35. State whether or not you saw other talking machines there along during that time from 1872 to 1878, besides these instruments **A**, **B**, **C**, **D**, **E**, **F**, **G**, and **H**.
>
> " *A*. Nothing else; that is all I saw.
>
> " *Q*. 36. State whether at any time during that period [1872 *to the spring of* 1878; *our patent was in the spring of* 1876] there was any conversation between you and Mr. Drawbaugh about patenting the talking machine, or as to why he did not patent it at the time.
>
> " *A*. I don't remember of any conversation between us as regards patenting.
>
> " *Q*. 71. Did you ever talk to him, prior to the establishment of the Clock Company, about going in with him on any other invention than the clock?
>
> " *A*. No, sir; not to my recollection."

Shettel was called, also, for another purpose, — to prove Drawbaugh's poverty; and he proved it in the most heart-rending language. He said that Drawbaugh told him at times that he was very poor; told him he did not have any money to get what he really ought to have for his family (defts, i, 221) : —

> " *Q*. 49. When did he tell you that?
>
> " *A*. Along during the year 1878."
>
> " *Q*. 50. State any other facts that you remember, bearing on the subject of his poverty during that year.
>
> " *A*. We came to Harrisburg at various times during that summer, and he didn't have the money to pay his toll, five cents, across the bridge, and I paid it for him different times; and also he didn't have money to buy tobacco for himself, and I bought that for him several times; and I several times gave him a dollar when we were over here to buy groceries for his family."

Drawbaugh was a partner in this Clock Company at that time. He had just received $500, a part of which he used to pay off a mortgage on his house; he had by that time bought another house on which he had a mortgage, and was paying that off; the other part of the $500 he says he had used in paying bills for the support of his family. His bargain with the Clock Company was that he should go in wit them, and work for the Clock Company, but get no pay for his labor unless profits came at the end. He was plainly in that condition of credit and resources where he would not be obliged to have daily pay to live on, or he could not have gone into a contract of that kind. On cross-examination we asked Shettel something about that. We asked him if he had not overstated his poverty. Not at all. He was as poor at all times as then. Finally we asked him (defts, i, 233): —

> "*X Q.* 156. If he was as poor as you say, how did you suppose he was going to live at all and support his family under such a contract?
>
> "*A.* Just as he did before he made that contract, by working many days for nothing, and depending upon his creditors to give him as they had been giving him before; but if he had asked of me for the loan of $25 or $50, I should have done it, but he never asked me for the loan of any money, with the exception of several dollars that I gave him at times here in Harrisburg, when we were over."

Now we begin to get a little insight into the credit of that man. He had resources and credit. Here was a man who would have loaned him $25 or $50 any time if he had been asked for it. Here was a man who went into the Clock Company with him, who was intimate with him, frequently in his shop, and he never asked him for $25 or $50, and never spoke about patenting a talking machine.

They put in a lot of judgments which had been obtained against him at different times. He appears to have been a man very slow to pay his debts. They put in judgment records; but it appears there never was an instance where the sheriff seized his goods and sold them. They would get judgment liens on his property. If there was a judgment, as of a justice, which only reached personal property, which could only be satisfied out of personal property, he, as was the case several times, got the attachment extended and the execution postponed for six months or a year, as under the Pennsylvania statutes he could do, by swearing that he had unincumbered real estate sufficient to meet it. There are certainly two cases on the record, where he got the execution extended six months or a year in that way (brief, p. 346). But when the sheriff came to him and said, "Now I have got to have that money," he always paid. Never were his goods seized in all those years.

I want now to turn to the deposition of *Cyrus Orris* (defts, i, 178). Your Honor will find throughout this record two things: one is, that evidence which appears to be of any importance is to be found in the question, rather than in the answer. The use of leading questions was the method almost invariably adopted by the defendants in extracting from their witnesses whatever they did extract. Right through from beginning to end, they would ask a man, "Were you there at such a time, and did you see a talking machine at such a time?" They would thrust under his nose an exhibit, and ask, "Did you see that at the time?" The Court knows that practised counsel do not do that habitually, unless they know it is necessary. A man may occasionally lapse into that method, but counsel of skill and long practice do not do that all through a case, unless they know it is necessary. It is not now a question of excluding such evidence. I am commenting on its value.

Mr. EDMUNDS. Some of your evidence, I think, is of that kind.

Mr. STORROW. I will tell the Court how they got their testimony. One man is asked for a simple fact, or a date, and the fact or the date is put in his mouth. I think I know the case that Mr. Edmunds refers to, and it is very proper to refer to it. In the case of Mr. Rupp (whose testimony I referred to yesterday), at the close of his testimony, we put to him, as we did to many witnesses, a question of this kind: "If Drawbaugh had had a practical speaking telephone all those years, and had shown it to his neighbors, and made it known that speech could practically be transmitted through it, do you think he would have had any difficulty in getting money?" That kind of question was put. I do not think those questions were necessary, because the Court would infer as much; but I think they were proper questions, and were properly put in that form. Such questions cannot very well be put except in that form. *They bring before the Court very pointedly the fact that the prominent men of that community do not believe the story.*

There is one other thing to be observed generally, with regard to the questions put throughout the defendants' case. They would put a question to the witness, "Will you state *to the best of your knowledge, recollection or belief?*"

Now, when you [illegible] getting a dull witness, a countryman, to testify to things four or five or ten years old, and you don't dare to put a question to him except in that qualified way, by salving over his conscience and permitting him to say, if he hears any question about it afterwards, "Well, I didn't know; I only answered to the best I knew," — there is nothing positive about it. The whole of their testimony is, by that fact, degraded below the level of evidence. The testimony of Cyrus Orris is of that character. This witness is a very good example, also, of the worthless testimony of the man who thinks he once saw something there, without anything to fix the date, and who lived alongside the shop ten or fifteen years. He is asked whether he made one of these affidavits about what he was to testify to (defts, i, 183): —

"*X. Q.* 56. Did you make an affidavit about them?
"*A.* I told them to the best of my knowledge; I couldn't just think of it at that time.
"*X. Q.* 57. Did you sign and swear or affirm to a statement at that time?
"*A.* Yes; to the best that I knowed."

He says he "couldn't just think of it." Your Honor will find that form of answer running all through their evidence, — "To the best of my knowledge"; "As near as I can tell"; "The best that I can remember."

John C. Smith (brief, 394; app. 91) was the witness I spoke of (p. 142, *supra*) who worked three years for the Faucet Company, and lived in the village, yet does not profess to have known anything about this until 1872. He began by testifying that he was at the shop considerably on Sundays. Then they asked him this question (defts, i, 351): —

"*Q.* 20. Did you hear any talking carried on through those instruments during that year?
"*A.* To the best of my knowledge, I did."

Well, in one sense, a man can only answer to the best of his knowledge, but when you find that kind of testimony on the vital points of the case, running through deposition after deposition, it makes the testimony very doubtful; it brings it below the level of evidence. This man, Smith, worked at that shop during a good part of 1877, the year after Mr. Bell's patent.

David H. Good, the storekeeper of the village, is another witness to whom I will refer. He is asked this question (defts, i, 527; brief, 378): —

"*Q.* 4. While you resided there [*which was from the spring of* 1867 *to the fall of* 1870] did you, at any time, have any conversation with Drawbaugh with reference to his talking machine; if so, what was the conversation, and when was it?

"*A.* No, not individually, but heard some; in the fall of 1868 I heard him tell two men in my presence that he had a machine that he could convey sound, or talk as plain as he was talking now" [*the Court knows that that was not true*]; "then he went on, of course, with a great rigamarole, that he had experimented; he did not say just what distance, but that he could talk at a distance, or hear."

We called one of those men (Hart), who said that nothing of the sort took place. The other one never was called by either party that I know of; they say his name was Ditlow; but as the other side have called three or four Ditlows, I don't know whether this man was one of them or not. Good was cross-examined about it.

"*X Q.* 15. When you heard him say that he had got a machine that would do what you have stated he said it would do, I suppose you believed, right off, that he had got such a machine, and that it would do it, did not you?

"*A.* I had every reason to believe it.

"*X Q.* 16. What do you mean by 'every reason?'

"*A.* I never knowed him to say anything of the kind but what he brought to perfection, in the way of machinery and invention.

"*X Q.* 17. Did it not strike you as rather a startling kind of machine, if it could do what you said it could do?

"*A.* Yes, sir.

"*X Q.* 18. And, notwithstanding that, you were ready to believe right off, that he had invented and made such a machine, just because you heard him say so to two men in your store; is that so?

"*A.* Yes, sir.

"*X Q.* 19. Do you think that the most of people who knew him in that community were disposed to accept his remarks about his own inventions with the same confidence?

"*A.* To a great extent."

That is the community, and those are the kind of people upon whose testimony your Honor is asked to rely. They testify to the best of their recollection, so far as they know.

Turn to the brief, page 283. It seems very startling that, in a dozen years of work on a telephone, by a man who was a good draughtsman, he should never have left a single piece of paper, or a single sketch, or any writing, or anything of the kind. It does not seem possible that a man could work out such an invention without a single sketch, or an indication of some kind of what he was doing; and apparently it so seemed to the defendants, for they had Drawbaugh testify (defts, ii, 782): —

> "*Q.* 26. Have you been in the habit of making and preserving any written memoranda or records to show the dates of your various inventions and improvements in telephones?
>
> "*A.* No, sir; not further than that I used to make plans on drafting boards for working by.
>
> "*Q.* 27. Were they preserved?
>
> "*A.* No, sir."

Well, a drafting board is a curious kind of contrivance for the drawing of a little instrument like a telephone. The back of a letter or a piece of paper is sufficient for that. But was that his habit? They put in the testimony of Mr. Lory, and he said that he recollected seeing a sketch by Drawbaugh in 1864, and they asked Drawbaugh about that, and he said, in reference to that alleged sketch of a telephone (defts, ii, 785; ans. 39): —

> "I was in the habit of making sketches or drawings at the time when I would be working on any inventions; not only this particular one, but all inventions."

That is not all. In the summer of 1879, testifying about molasses faucets (alleged to have been invented along about the same period as the telephone) in the faucet interference case, he produced sketch after sketch of this faucet. On cross-examination he said he had a box in his shop with perhaps five hundred letters and papers in it; and that he was in the habit of making sketches on the backs of letters and on pieces of paper, and he produced sketch after sketch. He did a little more. His evidence about it is in complts, iv, 100, quoted in brief, 284. Let me read exactly what he says. He produced a sketch of a faucet and said: —

> "*A.* 68. It was made about 1871 or 1872; I can't get within a year, perhaps; there are a number of other sketches in the same

book of other machinery made about the same time; they are all old sketches.

"*Q*. 69. Will you produce any other sketches?

"*A*. Here is a sketch that I made about the time that I was experimenting on telephones or phonographs, about 1874 to 1876.

"*Q*. 70. To the best of your knowledge, when was that sketch made?

"*A*. About 1876; it might have been made before.

"*Q*. 71. Was it made later than 1876?

"*A*. To the best of my knowledge I don't think it was.

"[*Book marked* 'G,' *produced.*]"

He said that he then (1879) had a box with about five hundred papers in his shop. Then another sketch is produced, and he was asked: —

"*X Q*. 151. [*Sketch and book* G *handed witness.*] Give us, if you can, the exact date, or an approximation of it, when that sketch was made.

"*A*. That might have been made three, four or five years ago. I go by the nature of the drawings; I mean the telephone drawing and the old plan of faucet. I was working on the telephone about that time."

Now, that is curious again. He fixes the time when he was "working on the telephone" as an epoch to date other things from; and the year of the epoch was 1876, perhaps sooner (three years before 1879, when he testified), but he thinks about 1876. That, an epoch of *work?* According to his present story, it was really the end of a dozen years of experiment, and he has never made any progress since. But apart from that, what does he mean by saying that he had no telephone sketches except such as had been made on a drafting board, and which had been planed off, when two years before he testified (in 1879), he *produced a book with telephone sketches in it*. Certainly the man's memory is not very good about it. That telephone sketch we have not got; it is not in the case; it is not on file in the Patent Office. It has been taken away; I do not say improperly, but as exhibits are usually used at the Patent Office; they are produced and shown, not filed, and then after the hearing, are taken away. He certainly did have sketches of the telephone, during all these years, yet they do not produce a paper showing anything about telephones. (See brief, pp. 283–285.)

Now, I think I have said enough, without going through any more witnesses, for your Honor to feel, more than ever before, the importance of the rule which the Court has laid down, that in cases of this sort, an important patent, on so stale a claim as they have presented, cannot be overthrown on memories nor on anything less than proof from conduct or unmistakable paper.

There are, however, one or two more witnesses whose testimony I want to speak of in this same connection. And first I will ask your Honor to look at defendants' surrebuttal, page 254; the witness is *Augustus Kahney* (app. 613). The particular and important thing in his testimony, and the only thing which has any direct bearing on this case, is his statement that he worked about ten days for the Axle Company at Drawbaugh's shop, helping them to put up their machinery, in the spring of 1875, about February or March; and that while there, at that time, he saw two instruments. He describes them at the bottom of page 258:—

> "One was about two inches through, and, as near as I can tell, from an inch to two inches high, with a mouthpiece on top of it. The other one was about six inches through, as near as I can tell, and an inch, or a little over an inch, through, that is, high, and had a mouthpiece on the side, or top, towards the edge of it."

Then he was asked, with a dramatic touch, to accompany Mr. Ott, the examiner, to Mr. Ott's office across the street, to go over and pick one out; and he goes over, without counsel, and picks out an instrument and brings it in. Well, that was not much of a feat.

He was a pretty important witness — *in one respect.* Your Honor will see presently how lame was the case which needed to be supported by such testimony. His testimony was that the instrument he saw at that time was one of those magneto instruments **D** and **E**, and flat instrument **A**. Now this was important evidence, for **D** and **E**, your Honor will find, are the instruments upon which this case must turn, as matter of law. They were terribly lame on witnesses to those instruments; he was a very important witness. Why didn't they have him before? He was called in the fourth year of the case, last winter, in surrebuttal. He lived right alongside of Drawbaugh all these years. Why did they not call him before? We found out, on cross-examination, that when they were taking their first testimony, three years ago, they visited him twice; that Mr. Drawbaugh, the counsel, and a justice of the peace, twice saw him, twice talked with him, and yet they didn't call him as a witness until after the lapse of three years. What does that mean? That is not all. About six months before he was called, he met one of the complainants' representatives in Harrisburg, and told him about the talking machine. He said that he worked at that shop, putting in machinery for the Axle Company, for a week or ten days, in the spring of 1875, and that he didn't see any talking machines then and was sure there were none, and that he remembered when he did first see a talking machine; that the first talking machines he saw were two machines like those very two, **A** and **D**; that he first saw them when he was living on a certain farm, and that he moved to that farm in the beginning of 1879. That he did then move to that farm is proved, because it was sworn to when he was on the stand for the defendants. He not only told all that to one of the complainants' representatives, but it was written out, and he signed it; and now, when he goes on the witness stand, that is put in his hand and he admits it, and he says, "Yes, I did write that; that was my recollections at the time"; but his recollections changed afterwards. So that when they were preparing their testimony in chief, they twice visited him, but did not call him. Six months before he testified, his recollection was that at the time the Axle Company was doing business, there was nothing of the sort there, and that he first saw it four years afterwards, in 1879; and he then says that after that it came to his mind; and now he comes and testifies as one of their prime witnesses, — if you can believe a word of his testimony.

There are some other witnesses to whose testimony I must call your Honor's attention (which appears in the same volume, page 224). They are his brother, *Orlando Kahney*, and two men by the name of *Joseph* and *Abraham Ditlow*, brothers, who were brought by us from the West to testify. The two Ditlows lived in Indiana and Kahney in Illinois, west of Chicago. They testified that, being at Drawbaugh's shop a good deal, frequenters of that shop more or less, under such circumstances that they would have known about a talking machine, if there were any there, they did not know of any, and did not hear of any until after the fall of 1876. They came on from the West together, and testified about the 1st of January,

1882. Those are witnesses whose subsequent conduct was such that I should not feel obliged to speak of them, or of their value in the case, were it not for the fact that I find in the brief of defendants an attack made upon me, about them; and I propose, therefore, to have your Honor read the testimony about them. I know perfectly well that when my brother Dickerson gets up to reply to what may be said about it, your Honor will come to a right conclusion, but I do not propose to have your Honor go for one moment with any doubt upon your mind, or to have one moment intervene between the time when your Honor's eye strikes such a thing in their brief, and the time when your eye shall see the refutation which the testimony affords. I do not propose to have any question about such a matter as that.

These men came from the West to testify for us, as I have stated. They were cross-examined. It would have been a very good thing for the defendants to have proved by a witness whom we called, that one of those men knew that there was a talking machine there. They were all old friends — warm personal friends — of Drawbaugh's. We had to go into that community for them as we did for everybody else, — among his friends and intimates, in his neighborhood, among those interested in him, — I mean in a friendly sense.

These persons were cross-examined; and if Drawbaugh had had the slightest recollection that upon any occasion he had ever shown to one of them a talking machine, he and his counsel would have put the question to them on the stand, "Don't you remember at such a time and place he showed them to you?" Nothing of the kind was done. Well, the defendants brought them back here. After they testified for us, they went up to Eberly's Mills, to the neighborhood where they or their families used to live, and one of them stayed there for two or three weeks, and the other six or eight weeks, and they visited Drawbaugh. They went to his house. One of them stayed all night with him; the other stayed in the next house, with Drawbaugh's nephew, George Drawbaugh, all night. They spent a long Sunday, two of them did, and I think another was there many times at his shop a week after; and they talked about the case with the whole Drawbaugh family. Then one of them comes back and says, "Why, I now remember that I spent a whole winter experimenting with Daniel Drawbaugh on his talking machine. I can't remember what it was, but I remember that I spent a whole winter experimenting on it."

That is one of the Ditlows. But he is not the witness I mean to speak of particularly.

Another one of them comes back — Orlando Kahney — and says, "Yes; I am all wrong. I had forgotten I was there. I was there in the summer of 1875. I went there with a fellow hireling, Basehore; he and I went there together to grind scythes, and we talked through the machine, — at least I did." And they produced Basehore to support him. And such a support! Kahney swore, even then, that that was the first that he knew of it; but Basehore swore that it was an old thing to Kahney. Basehore's story is that they went there and talked (he did not, but he saw Kahney do it) over a line which ran from Drawbaugh's shop to his house, in the summer of 1875. Now, we know from Mr. Drawbaugh's own testimony that no such line existed in that year. We know from the testimony of others that about 1878 a line running all the way, or part of the way, in that direction, did exist. That is enough to take care of those witnesses.

But that is not all. The defendants introduced this witness, Orlando Kahney, with a good deal of flourish of trumpets, because he had testified for us; and because, after going back to the West, he wrote the letter which is at the bottom of p. 225, dated Jan. 1, 1883 (it should be Feb. 1; it is so understood). He had spent a day with Drawbaugh; had seen him again and again; had been at his house. He goes West and then writes this letter (defts, iii, surbtl, 225): —

"TRIUMPH, Jan. the 1, 1883.

"*Friend Daniel,* — I thought I would write you A few lines to let you know that I got back all right again and to let you know that last night there was some things came to my mind the first that I ever heard of a talking Meshien it was in seventy-five and know exactly when it was or can find out with very little troubel and thare was A man told me in Mendota to-day [*Mendota was where he lived*] and he said that he knew of you talking of having being working at the talking maschien in the year of seventy and let me know whether I shall see Smith or not right soon for I may leave here soon with this I close my respects to all, address Mendota, Lasalle County, Ill."

Smith, it appeared, was a man in Illinois, in Chicago, with whom this person had been a fellow workman. Before he went West, and before he wrote this letter, which professed to be the first announcement of a change of views, he had told Drawbaugh that Smith would probably be able to support him in proving that he had known of the thing at a date earlier than he had testified for us.

Mr. Hill. That is your inference. You do not state that as a fact?

Mr. Storrow. State what?

Mr. Hill. That he had told Drawbaugh.

Mr. Storrow. Your Honor will read it; but my recollection is that he had talked to Drawbaugh about going to see this Smith. The letter shows that. "Shall I go to see Smith or not?" What he expected to get from Smith was to get Smith to swear that he (Kahney) had made to Smith statements inconsistent with what he had sworn to when he testified for us.* Kahney went to see Smith, and thereupon Smith was not called. Then they asked Kahney (p. 230): —

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* Kahney testified (defts, iii, surbtl, 231): —

"*X Q*. 61. Who was the person referred to as Smith in the letter?

"*A*. David Smith.

"*X Q*. 62. Where does Mr. David Smith live?

"*A*. He lives in Chicago.

"*X Q*. 63. What is his business?

"*A*. He is a dentist.

"*X Q*. 64. Had Mr. Drawbaugh asked you to see Smith?

"*A*. No, sir; I told Mr. Drawbaugh I would go and see Smith.

"*X Q*. 65. What were you to see Smith about?

"*A*. To see if he remembered of the time that I spoke to him about the telephone.

"*X Q*. 66. How came you to offer to go to see Smith about the telephone?

"*A*. To see if he remembered if I had made any dates on the day that we spoke of it.

"*X Q*. 67. Did you tell Mr. Drawbaugh that you thought that you had spoken of it to Smith?

"*A*. Yes, sir.

"*X Q*. 68. How long have you known Smith, and where did you first know him?

"*A*. I have known Smith, I think, since 1880; I ain't just positive; I got acquainted with him at Triumph, Ill.

"*X Q*. 69. When did you talk with him about the telephone?

"*A*. The fall of the same year that I first met him. It was while husking corn for B. J. Hall, at Triumph."

"*X Q*. 72. When was it that you told Drawbaugh that you would go and see Smith?.

"*A*. It was before I went out to Illinois."

"*X Q*. 104. Have you seen the dentist, Smith, since you first wrote to Mr. Drawbaugh?

"*A*. Yes, sir.

"*X Q*. 105. When did you see him.

"*A*. I think it was in February that I saw him."

"*Q.* 47. What caused them to come back to your memory?

"*A.* I was studying over being in Philadelphia and everything, and it come to my recollection that I had seen and talked with Mr. Drawbaugh on the talking machine.

"*Q.* 48. Do you mean, talked with him *by* the machine or talked with him *about* the machine?

"*A.* Talked with him *by* the machine, or that he rather talked to me by the machine.

"*Q.* 49. And you wrote to Mr. Drawbaugh informing him of it, in order that no injustice might be done by the mistake which you saw that you had made at Philadelphia; is that the way of it?

"*A.* Yes, sir."

He had done an injustice; and that made him write that letter.

Now let us see what he did. That is what he swears to as the truth. Well, after writing that letter to Mr. Drawbaugh, he wrote a letter to me, and this is the letter (defts, iii, surbtl, 243): —

"TRIUMPH, March the 8, 1883.

"FRIEND STORROW:

"I thought I would write you a few lines to let you know that I got home all right, and am feeling as good as ever, and to let you know that I herd from Dan, and that he wants me to come back again, and I have thought over some of my deposition, and I find that I have testified to some things that I wasn't right about, and would right them if I could, or would get A Chance, and hope that I will. I do now believe that there was a telephone there as far back as 1873" [he swore to 1875 finally, concluded to take 1875] — "and know there was, and know there was, and am glad that it has come to my rekalection, and am very sorry that I have give in the evidens that I have. I have had telephone on the brain ever since I got back, and I want you to wright to me and tell me what I had beter do. I can keep out of their way if you say so dont fale to write and give me advise, and tell Comfort that I still Play seven up sometimes. with this I stop, your

"Friend ORLANDO B. KAHNEY.

"Adres Triumph, Lasalle County, Ill."

MR. HILL. That is your witness, and not ours.

MR. STORROW. That is your liar. He is your *liar*.

Again: —

"MENDOTA, ILL., May the 23 1883.

"FRIEND STORROW:

"I thought I would rite you and let you know that I am getting along well and to ask an advise of you whether I had better or not come and testify on the on the other side Dan he says he wants me to come rite and let me know what you think about it.

"ORLANDO B. KAHNEY.

"Address Mendota, Lasalle County, Ill."

What would your Honor have done if you had got such a letter?

Would you have said to the man, "I will send you a check": or would you have put the letter in your pocket and kept it to use when he came along, and made no reply? My associates and myself of course made no reply. And that is the man upon whom they rely.

And now, on those facts, on those letters, which we left without communication of any kind between us and that scoundrel, they state in their brief to-day (pp. 305, 307):—

> "The extraordinary methods of the complainants in prosecuting this case ought to be looked into and strongly condemned by the Court. The most unscrupulous means have been resorted to at every point to prejudice the defendants and mislead the Court."
>
> "They refused to allow Orlando Kahney to return and correct his testimony, although he applied to them for the privilege of so doing."

That is the assertion they make; and they have brought a senator of the United States here to illustrate that, and to try to make your Honor believe it.

Now I turn to the instruments **D** and **E**. The story is that these were made in the spring of 1875,—February or March; about February, I think. This set, **C** and **I**, as your Honor remembers, are alleged to have been made five years, and this **A**, during the year before. This instrument, "**C** reproduced," I hope your Honor will not handle, as it is a dangerous thing. Let me prop it up so it will not tumble down; if the heavy magnet were to fall on your toes it would be very painful. Mr. Benjamin, who is a gentleman of intelligence, having a proper regard for personal comfort, as soon as he came to see this, put a clamp on there and screwed that heavy magnet down, so that disaster could not happen. Mr. Drawbaugh, a first-rate mechanic, a handy man in the use of tools, used that all that time, continually, year after year, so they say, and he never screwed it down! There is not any fastening to it, and there is no fastening to the block, no screw hole in the board by which it ever could have been fastened, and you could not handle it, and yet they expect your Honor to believe that story.

Their story is that, after making **D** and **E**, he made this pair (**L** and **M**), and this pair (**G** and **O**); then this (**H**), — this Blake transmitter, as we call it; and that, after making **H**, he made this instrument (**J**). The story is that **D** and **E** were made in the beginning of 1875; and next **L** and **M**, which were microphones and magnetos, in 1876; that Drawbaugh jumped at one bound from this broken tumbler **F** to these very refined structures, **L**, **M**, **G**, **O**; that these four, **L**, **M**, **G**, **O**, were made very nearly at the same time, and this **H** soon afterwards. And they produce witnesses, from whom they wish your Honor to believe that **H**, that Blake transmitter, was made in August or September, 1876.

Your Honor will remember Mr. Bell's patent was in March, 1876. Mr. Bell's exhibition at the Centennial was June 25, 1876; and by midsummer, 1876, he became famous everywhere. That was the time when he became publicly known in all the papers as the inventor of the telephone.

After making that Blake transmitter **H**, Drawbaugh, they say, made this (**J**). They say a year or two afterwards. Your Honor will see that this is the same thing, really. The difference is that the circular diaphragm of **H** is expanded in **J** out into an ellipse, and there are two sets of contacts on **J**, instead of one as in **H**. But all the parts and details are the same in both; **J** is only a double-barrelled **H**. Instrument **J** was made under a foolish notion that if you got so much result out of one set of contacts, you would get twice as much out of two. It is like an effort to make anybody believe that half a dollar is less in proportion to one dollar than one dollar is to two. It is the same sort of fallacy.

Drawbaugh testifies that he found in practice there was no advantage in this duplication, and that **J** was not a better instrument than **H**. He made this instrument **P** afterwards, which is no advancement on that **H**. It is the carbon microphone called **P**. Instrument **P** consists of a carbon microphone transmitter and a magneto receiver fastened to one board in a compact form. The only thing in this was connecting them together and fastening them on to one board, a mere matter of mechanical arrangement. Of course this microphone is a little differently arranged from that in **H**, but there is no difference of any importance; and Drawbaugh testified he did not find any particular advantage in this. He afterwards made this instrument **K**; but it is pretty hard to know whether he claimed to have invented it or not. It had been described in the newspapers two years before he said he made it, and it is what is called a rotophone. This crank is turned and a friction clutch is applied to it, which is fastened at the centre of the diaphragm. That friction clutch is controlled by a magnet which pulls it more or less. If it is pulled down hard, it drags the diaphragm rather hard back. If the friction clutch is applied gently, the diaphragm is not drawn so far back. By varying the pressure of the friction clutch on the wheel, you can pull the diaphragm more or less, and in that way vibrate it.

Now, that pressure of the friction clutch on the wheel is arranged to be operated by this electro-magnet, which in turn is operated by the varying currents which come from the articulating transmitter. In that way the current due to the articulating transmitter varies the attractive force of that magnet, and the pull of this clutch on the diaphragm. It is a machine which, even when properly made, gives results which, as Drawbaugh says, are not worth having. Drawbaugh never finished one. The mechanical imperfections of the instrument produce so many disturbances that the sounds are not true, although they are very loud.

The instrument was invented by three different inventors, independently of each other, Mr. Edison, Mr. Dolbear, and Mr. Berliner. A later improved form, made by Edison, has been known for some time, and with it you can get fair articulation and a loud sound; that is, you can hear it anywhere in an ordinary sized room. But Drawbaugh says he did not finish this, because the sound was so poor that it was not worth going on with any further.

Your Honor observes these statements in his history: That up to a certain time, the beginning of 1875, he had made those, **F**, **B**, **C**, **I**, **A**. Your Honor knows that no telephone apparatus made up out of those instruments will talk enough to anticipate a patent. The New York tests settled that question. Then came those curled magnet instruments **D** and **E**, **L** and **M**, **G** and **O**. Instruments **L** and **M** were origi nally microphones and magnetos combined in one box. He found that to be a poor plan, and took out the microphones and used what remained in **L** and **M** as magneto instruments. These, **G** and **O**, are microphones, — transmitters merely. You cannot hear at them, you can only speak in them. This set **D** and **E**, then, are the first really speaking instruments. They are said to have preceded the microphones by a year, more or less. Their allegations are that **D** and **E** were made in February, 1875, and that **H**, this Blake transmitter, was substantially completed in August, 1876, and that **L, M, G, O** came in between. I find in their brief, in one place, that they say **L, M, G, O** were made in 1875 *or* 1876; in another place, that they say *this* group, **L, M, G, O, H,** was produced after February 14, 1876, and that those instruments, **D** and **E**, antedate our patent; and they wish us to understand, I suppose, that those instruments, **L, M, G, O, H,** are the ones that came immediately after our patent.

Defendants' allegations:

D and **E**, the first real speakers, February, 1875.
L, M, G, O, microphones, March, 1876.
H, Blake transmitter, August, 1876.

Also: —

Mr. Bell's patent, March 7, 1876; application Feb. 14, 1876.
Mr. Bell's Centennial exhibition, June 25, 1876.

The condition of things then was, if their story be true, that fifteen or sixteen months before Mr. Bell's invention was generally known, and before he became famous in the world, in all the newspapers, as the inventor of the telephone, and even before the telephone was ever mentioned in any newspaper in the world, that Drawbaugh had had **D** and **E**; that he then had *this* group, **L, M, G, O,** a few weeks old, and *this* **H** nearly finished, or just finished.

He testifies that he heard of Mr. Bell in the summer of 1876, and heard of his speaking telephone exhibition. He thinks he read of it, but does not remember where, or in what paper (defts, ii, 858, 1048). He has an impression that he read it, or that somebody told him of it; but he does not remember where nor from whom he heard it. At the time when he heard it or read it, if their story be true, he had got **D, E, L, M, G, O** finished and in working order, and the Blake transmitter **H** just about completed. Now, there is no doubt about their excellence. I don't say that they are good for commercial use, but you can talk through them with proper skill and care. They are defective instruments, because they are liable to break contact. I have mentioned already the defects which run through these instruments, but they are good enough instruments to anticipate a patent, and good enough instruments to be put into practical use in skilled and careful hands. He never could have any doubt in his mind about his own priority, if he had **D** and **E** fifteen months before he heard of Mr. Bell; and if he had **L**, **M**, **G**, **O** before he heard of Mr. Bell, and was about finishing **H** before he heard of Mr. Bell, he never could have had any doubt in his mind that before he heard of Mr. Bell he had a good instrument. Think what a shock it must have been to a man, in the summer of 1876, after ten or a dozen years of work, having these instruments **D** and **E** for a year or eighteen months, and all these microphones just completed, just finished, to hear that another man was becoming famous as the inventor of the speaking telephone! Why, the very stones in the street would cry out if such a thing happened to them!

Let us see what this man thereupon did. There could be no doubt about the effect which those two instruments **D** and **E** would produce on any inventor who had been struggling with these things for ten or twelve years, if his story is true; and I will not stop now to criticise whether his story is true or not; I am now taking just what they assert, and asking your Honor what you will believe *on their record and nothing else.* These two magneto instruments **D** and **E**, if they came when he says they did and were what he says they were, must have produced a great effect upon him and upon everybody else. If he had been laughed at because he was trying to invent something which everybody knew could not possibly be invented; if he was walking through the streets with his head bowed down trying to invent a speaking telephone, why, he had got it there! All doubts were gone. The thing was done. He had been trying, but now he had succeeded. That is an epoch, that is a time, that is a fact, — if it be a fact,— which could not have failed to have impressed itself on everybody's mind; not only upon his, but also upon the mind of everybody about him. If he had had these magnetos **D** and **E**, think what would have happened. When people came in there, he would have shown them these telephones; if the story be true, everybody would have seen them. They would have been always ready; they needed no battery, no adjustment was required; you had only to take them up and talk through them. There could be no difficulty about proving those, — if there was a word of truth in that story. The handwriting on the wall was not plainer than would have been the effect of these instruments, — if he had made them.

Now, let us see what their record is about them, and what the proof is. In the first place, how material are they in the case? If I have time (perhaps I shall not, but it is in the brief, p. 516) I shall ask your Honor to look at the rules of law, and at the authorities (one in particular) as to the date which the law assigns to Mr. Bell's invention. Perhaps the most conclusive authority is the telegraph case — O'Reilly *v.* Morse. There, a foreigner had published his invention in June, 1837, and, to sustain Morse, the date of his invention, the date which the law assigned to him, must go back of that. Now at that time — June, 1837 — Morse had not made an instrument. He had not put his invention upon paper. Four months after that he filed a caveat; that was the first thing. But the Supreme Court said that they were satisfied he had worked out in his mind the plan of his telegraph, and the character and nature of the instrument which he afterwards described in his patent; and that that was enough. That and many other authorities are collected in the brief, which your Honor will go through, of course.

Those instruments **D** and **E** are not alleged to have been made until after Mr. Bell had disclosed his invention to Dr. Blake and Prof. Cross. We understand the rule to be that a defendant, to anticipate a patent, must set up a practical machine at a date earlier than that which the law assigns to the successful patentee as a date for his invention. If that be so, that is an end to the case. But I go on now, regardless of that, to see whether they were or were not made before the issue of our patent.

To prove that they were made before, they have got memories, and nothing but memories; the same kind of memories which I have been discussing for half a day or a day. That is all, and there is but very little of that. We have collected the matter about those instruments at the latter end of the brief, beginning at p. 450.

Drawbaugh was asked on his direct examination (p. 452 of the brief): —

> "*Q*. 259. To what extent did you use the instruments D and E?
> "*A*. I used them very often; I couldn't state how often.
> "*Q*. 260. Did anybody talk through them or listen through them besides yourself?
> "*A*. Yes, sir; a great many persons. What I mean by that is a great many persons who come to the shop there."

If that be true, we shall have a great many persons listening through them, from the time they were alleged to have been made, and before the grant of the Bell patent. We shall have a great many persons listening through them during the year after the time they were alleged to have been made, and before the date of the granting of the Bell patent.

In the first place, if we apply to the *Drawbaugh family*, we don't get much information out of them. I will speak of Daniel Drawbaugh presently. His brother John has seen them, but he doesn't know when. His brother Henry says he began to run his line of freight cars in May, 1876; and his recollection is that he saw D and E some time before that, but he cannot tell in what year. Afterwards he says he rather thought on the whole that it might have been in the summer before, but he says squarely that he can't tell in what year it was. Mrs. Daniel Drawbaugh, as I have already said, they did not call. George, the nephew and the next-door neighbor, was called. The difficulty with his testimony is that he says he saw them, but he don't know when. He was not even asked when he had ever used one of them. Upon all those members of the family, startling as these machines would have been under these circumstances, they made no impression. Harmon Drawbaugh, the nephew, says that he made them, under his uncle's direction, of course. He is the only one in Mr. Drawbaugh's family who gives any help. We shall examine his deposition by and by, and see just what it means. For the Drawbaugh family, see brief, pp. 456-468.

I now want to take up the witnesses (beginning on p. 469 of the brief) who say they heard speech through those instruments before the date of the Bell patent.

William H. Decker (brief, 469; abstract, 251).— He heard them six months before the time when Harmon Drawbaugh says that he made them. He says that he heard them in the commencement of the fall of 1874; Harmon Drawbaugh says that he made them in 1875. Let them settle that quarrel as the please. Decker is the man who heard about Jacob May's baby a year before that was made also (p. 184, *supra*).

Jeremiah Fry (brief, 469; app. 43). — Kept the store at Eberly's Mills. He lived there from the spring of 1875 to the spring of 1880, right alongside of Drawbaugh. At the time he kept the store he was right alongside of Drawbaugh. He began to keep store in the fall of 1875. He was the one who began to keep the store after it was blown up, which was in January, 1875. He says that he saw them, and he was sure it was the 9th of April, 1875; he was sure of that date, because he sold some potatoes to Drawbaugh, which he had raised on a particular farm; and he is quite sure that is the time when he saw them. Of course that is not enough to fix the date; but there is a good deal about his testimony which is valuable. Those are instruments which would talk, and talk well; not very loudly, but well and perfectly plain. They asked the witness Fry (defts, i, 150): —

> "*Q*. 14. Did he talk through any of the machines to you at that time?
>
> "*A*. He sang."

And that is all he knows about it. "He *sang*." Are you going to believe that when Drawbaugh had those talking instruments, the first that really talked, and made an exhibition of them to this witness, that all he did was to *sing* through them? It is impossible that those could have been talking machines, or that he could have heard **D** and **E**; or else he got the date wrong, and got the whole thing mixed. What effect did that exhibition produce on Fry? Why, he says that he talked with several persons about it, whatever it was. His statement is: "I talked with several persons; that is a very good thing, if he gets it accomplished." What! Have instruments like those, and the only use made of them to sing! And the effect produced on that man be, "It is a good thing, *if he gets it accomplished*"; and the neighbors thought so too. Why, the tin-can and tumbler instrument will produce that effect, will do that thing, but **D** and **E** are *talking* instruments. That witness doesn't hurt us.*

Isaac B. Millard (brief, 470; app. 90). — He has nothing but memory. He began by saying that in 1869 he talked through the tumbler and tin can, and heard perfectly well. That was an impossibility. He says that he heard it over an outdoor line which ran from the shop out on to the bank; but, according to the description of his circuits given by Drawbaugh, no such line existed for eight or ten years after that. Afterwards, in 1877 or 1878, such a line did exist, but that was after telephones were known everywhere. Then he says he saw **D** and **E**, and he tries to state the date. First, he thinks, as near as he can get it from a vague recollection, that it was in 1874. That was before the defendants say they were made. Then he thinks along somewhere in 1875 or 1876. Finally, he thinks that, on the whole, he has not been at that shop since the winter before the Centennial, and he must have seen them then. His testimony about the instrument is worthless, for his memory is very vague, and he has no means of fixing the date with any degree of positiveness.

Daniel Fettrow (brief, 470; app. 94), a very important witness. He was the blacksmith at Eberly's Mills; the only mechanic who lived there besides Drawbaugh; Drawbaugh's tenant and the man to whom I have already referred. He testified that the first time he ever saw a talking machine or that Drawbaugh ever spoke to him about one was in March, 1875. Now, think of that! The only mechanic in the village, interchanging work constantly with Drawbaugh, *living under the same roof with Drawbaugh ever since* 1868, yet never was spoken to on the subject, and never saw one of them until 1875, so he says. And yet they want you to believe that eight years before that, and during the whole of that time, there had been a perfect instrument there, and that everybody knew of them, and they were the chief thought and chief occupation of Drawbaugh's life. He had heard, he thinks, something about it before that; and this is what he had heard (defts, i, p. 366):—

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* Jeremiah Fry testified, defts, i, 156: —

"*X Q.* 67. Did you ever, while you lived at Eberly's Mills, talk with other people besides Mr. Drawbaugh about his talking machines?

"*A.* Yes, I talked with several persons; that it is a very good thing if he gets it accomplished.

"*X Q.* 70. Did these people that you talked to about it think it would be a good thing if he got it accomplished?

"[*Objected to.*]

"*A.* Yes; *they all allowed it's a very good thing.*"

"*Q*. 26. You had heard" [this is what I call a leading question]—"you had heard his talking machine spoken of in the neighberhood before, had you?
"*A*. Oh, yes.
"*Q*. 27. What did people say about it?
"*A*. Called it tomfoolery."

That is all he knew about it—a man *living in the house with Drawbaugh for eight years*. That was the extent of his knowledge. What is the use of bringing loafers to testify to the existence of perfect talking machines, and that everybody knew of them, when this fellow mechanic, under the same roof with him, knew nothing about them? That is not all. There were some other people under the same roof who didn't know. They did not call Mrs. Drawbaugh, and I confess I do not see any sufficient reason why they should not have called her.

Again: this Fettrow has a son, William, who has been spoken of again and again as a frequenter of that shop. He was twenty-one years old in 1879; he was old enough in 1875, or before that, to have known all about it,—older than some of the witnesses whom they called. He has been around Milltown and Eberly's for years. In fact, he was one of the company present at the interesting meeting of which I have spoken, at Drawbaugh's shop last winter, when they talked over this case, when the Ditlows were present, and before they came back with changed views and recollections. He was present at that meeting; they don't call him (brief, p. 293; app. 103). They can't get anybody out of that house to help your Honor to believe that these things existed during most of the time alleged, or who will themselves believe that part of the story.

Now, Daniel Fettrow says that he knows it was about March, 1875, because he was there doing a job for the Axle Company; that it was while he worked for the Axle Company. But he had been for years and years before and since doing all the blacksmith work required to be done for the machine work going on in that shop. His own account book shows that he worked for that Axle Company every few days for fifteen months after that. He has work charged to them as late as the 1st of September, 1876. His books show that, and he so testified. What has he got to fix it by? Well, he thinks it was the first thing he did; not the middle, or the last, or some other thing. That is all. Well, if that is competent testimony, it is of the weakest kind. No man would rest a date on such evidence as something which could free his mind from doubt, if there was the least ground for suspicion, even if there was no evidence to counteract it, no weight of testimony to meet it.

But that is not quite all. He said he saw this instrument, and he recognized it by that "*curled magnet.*" That is a pretty good thing to recognize it by. Many of the witnesses say that they recognize it by that curled magnet. The instrument as made had a covering on it like **E**; Mr. Drawbaugh so testifies, and that concealed the magnet. After a while the cover got lost off. He doesn't say how. It could not have been very early, because he had no occasion to take them apart, inasmuch as he says that he never made any change in it. You cannot get off that cover of **E**; this adjusting screw prevents it dropping off. You have got to take it all apart, or deliberately loose the cover, or smash it. You couldn't use it long without a cover. Those screws now on **D** and which now hold the magnet have been put on recently for the purpose of this case. In that instrument the magnet is held a little way off from the bottom, and is fastened only by that little pivot at the centre. Put that in a man's hand, and let him grasp it tightly, to hold it to his ear, and you inevitably shake the magnet or bend it, and it gets out of order. And that is what occurred in this suit, so that when this **D** came to be tried, it was necessary to put a couple of screws and a block of wood in there, to hold that in place, just for a few hours' test. No one would ever think of using that with the bottom off. Now it is said by Fettrow that he saw that thing, when, if their story be true, and if his date be true, it was not a month old, and that he recognized it by the curled magnet; so that the bottom was lost then. They haven't got a witness who ever saw a bottom on that. They all, or pretty nearly all, recognize it by the curled magnet, — early and late. How does that happen? Are you going to believe that within two or three weeks after it was made the bottom of the box dropped off, when the adjusting screw keeps it there, and that it was then lost and never replaced? Impossible! This is shown to them now, and the curled magnet is conspicuous; so they catch on that. One man (Updegraff) says he remembers it because it was like the curl of the ear. He saw it, according to his story, a week or two after Fettrow did, when it was not a month old, if their story is correct. He sees the curled magnet now, and thinks he recognizes it. He does not know that he didn't see it in former times; he doesn't know that when he says he was at the shop it couldn't be seen. He is now ready to swear that he recognizes it by that, and yet he never saw it in the world. That disposes of that class of witnesses. I mean it shakes your confidence in that kind of testimony. As to recognition by the curled magnets, see brief, pp. 471, 479.

One more thing about Mr. Fettrow. Harmon Drawbaugh (for I may as well take the evidence up at this point about that; it will be found on p. 500 of the brief) assisted in making **D** and **E**, he says, and he testifies in this way: —

> "*Q.* 131. Who made the curled magnets for those two machines [**D** and **E**], if you know?
>
> "*A.* He [Daniel Drawbaugh] made the one for the first one, and forged it and shaped it, and I made the other, I think; there were several, — quite a number of them made, — and I know that Fettrow made a couple, but I don't know which of them were used."

Several magnets were made. He forged one, Daniel Drawbaugh forged one, and Fettrow forged a couple. All agree that those four magnets were made when the instruments first were. At any rate, Drawbaugh swears that he never touched the magnets since (defts, ii, 1107, ans. 1700). Plainly the meaning of that testimony is that Fettrow forged two magnets at the time **D** and **E** were made, and Daniel Drawbaugh and his brother, another (the witness does not know which), but that they were all made at the same time. The defendants take that view of it. Our witness, Mr. Pope, testified that those were rather weak instruments; and they wanted to get him to admit that the magnets might have lost their magnetism; while good magnets made of a particular kind of steel — as tungsten steel — will preserve their magnetism longer. The defendants' counsel asked Mr. Pope (complts, ii, 1450): —

"*X Q.* 401. Assuming that Drawbaugh made the instrument **D** and **E** in the early part of 1875, and that he either made the permanent magnets himself, or employed the village blacksmith at Eberly's Mills to forge them for him, would you expect them to be made of tungsten steel, and would you not consider it highly probable that they would partially lose their magnetism in the course of seven years?

"*A.* I don't think they would be likely to be made of tungsten steel under the circumstances; and hence, it is possible that magnets so made might lose a portion of their magnetism during the length of time mentioned."

Now in order to prove the poverty part of their story by Fettrow, they put into the case a copy of his account of *all* his dealings with Drawbaugh from 1868 to April, 1876, which embraced *all* his dealings with Mr. Drawbaugh from the year 1868, and showed everything that he had let Drawbaugh have, so he says (defts, i, 370; defts, exhibits, p. 6). There are in it little items of five and ten cents, for pieces of forging, pieces of iron, nails and so on. Between April, 1874, and April, 1876 (at which time that account ends), *there is not a charge for a magnet; there is not a charge for a piece of steel out which the magnet could have been made; and there is not a charge of any kind which by any physical possibility could have included those magnets.* Now where are we? *That is the only piece of paper that connects itself with any of those instruments.* That is the only time, in the whole case, where there is any proof of the origin of anything used in these instruments. Where does that carry us? The account ends in April, 1876, when Fettrow's relations with Drawbaugh ceased. He then bought his house, and Drawbaugh moved to Mechanicsburg.

E. R. Holsinger (brief, 472; app. 103). — He is the man who proved that Drawbaugh's "whole heart and soul," and his too, were in the talking machine; but which he and Drawbaugh unfortunately omitted when he printed that advertising card, and which Holsinger forgot to mention when he mentioned other things which he did, the clock, etc., in the newspaper article. Your Honor will read this deposition. It is the deposition of a fanatic,—of a fanatic almost on the edge of lunacy. He is full of that power of exaggeration, of self-delusion, of seeing the thing which is not, stronger than the thing which is, and believing it himself, which belongs to that class of men, as you will see by his language and the manner of his deposition, and in the substance of it all through.

Now, may it please your Honor, I have not been long, *but I have named every witness called in their case in chief who pretends to have talked through these machines* **D** *and* **E** *before the date of Bell's patent.* Six witnesses in chief are all who pretend to have talked through them; and such they are. Even they do not all say that they heard talk. Take Fry: did he talk through them? No; he "sang." Decker saw **D** before it was made, and so on and so on.

After that we came to the New York tests. Apparently, one may conjecture, as the alleged reproductions of the alleged earlier instruments had not been tried when these witnesses testified, that the defendants thought it was as fatal to us for them to prove the glass tumbler **F** and the tin can **B**, as to prove **D** and **E.** I don't know whether that was so or not; it is conceivable, however. But the New York tests settled it forever that nothing could carry this case except the instruments **D** and **E.** These are the only instruments which, as matter of law, can defeat Mr. Bell's patent.

Then the defendants went to work and took surrebuttal testimony for a year; and they had had a year to get ready in, while we were taking our proof. They took the testimony of two hundred and thirty-eight witnesses. They did not confine themselves to surrebuttal; they brought in cumulative witnesses, which was natural, perhaps, under the circumstances; they brought in large numbers of purely cumulative witnesses.

Now, of course, we are going to find lots of witnesses — lots of witnesses — who saw these machines **D** and **E**, because Drawbaugh says that a great many used to listen through them. The defendants had been warned that they were the crucial instruments. But *out of all that fine-tooth-comb work, which gave them two hundred and* *thirty-eight witnesses, they could find but two men who dared venture to pretend to think that they had a kind of a sort of a memory that they had once talked through those things* D *and* E *before the Bell patent came out.* They had some others who saw them, — that is all. I will call your Honor's attention to those two, and I think you will find those two are enough to dispel all confidence in the defendants' case.

John Simmons (brief, 474; app. 569) is the first. There is a curious story about him. I have spoken of some witnesses whom we had and whom the defendants brought back, — the Ditlow family and Kahney. We also had to testify for us at the same time one Jacob Evans, a brother-in-law of the Ditlows. He had lived at Eberly's Mills, and had run the mill — not as owner of the mill but as journeyman — for a good many years, from 1874 down to 1881, I think, or until after the time when this controversy began. He then moved away a few miles to another mill. While the defendants were taking their testimony in chief, they went to see him, brought him to Harrisburg, examined him privately, showed him the instruments and sent him home; they did not call him. Then we went to see him. He said that we need not trouble ourselves; Drawbaugh had shown him all the exhibits; he never heard of any at any time material to this case; he never saw any instruments; never heard Drawbaugh had a telephone until 1877, — after the Bell patent. We called him, and he swore to that. He appeared to us to make a pretty good witness. He and his wife were neighbors of Drawbaugh's, intimate personal friends of Drawbaugh's, and visiting there during the progress of the suit. They could not find in him or her any recollection to help them; and we called him to testify to exactly what he had told them a year before we ever went to see him. When the Ditlow family came on the stand, he came back; but he didn't know much. It was pretty hard work for him to swear to anything; but his wife, his sisters and his brother all told a story to the effect that, on the 5th of *December*, 1875 (and they fixed the exact date, if they fixed anything), they came to visit him and his wife, and they all went down to Drawbaugh's shop and saw the talking machine, and Drawbaugh talked through it, and Jacob Evans listened; none of the others listened; they looked at the other things in the shop;

but while this was going on they had not curiosity enough to listen; I think, on the whole, that Andrew Evans, the brother, bears the palm over everybody else in this case for obtuse stupidity. Jacob Evans could not remember what he had seen. They didn't ask him to identify the instruments: when he was on the stand for us he swore he had never seen them. Some of those who were with him thought they saw or saw him use **D** or **E**; I think that one of them thought so. The others didn't know; that was the extent of his knowledge. For the Evans family see appendix, pp. 562–582. The falsity of their story is there conclusively shown.

After that comes along John Simmons; and John Simmons says: "Why, I know all about these instruments; I went to that shop in *November*, 1875, with this same Jacob Evans, and he and I and Drawbaugh talked through this machine, and we talked through **D** and **E**." John Simmons professed to be a first-rate witness. He knows all about it, and he tells a curious little story, the substance of which, as near as I can make it out, is that, with the instrument lying on the bench and he away off by the stove, he could hear it talk. I do not know that that is quite clear, but that seems to be the description of the situation, and that is the account that he gives. Who is John Simmons, and why did they not call him before? He is a neighbor, — a next-door neighbor, — and he lived there in the village during the whole time of this controversy; and the question would naturally arise, Why did they not call him before? He not only lived in that village, but *he has been employed in the shop of these people all through this controversy; has been employed as a workman in Drawbaugh's shop at Milltown.* They talked to him early in the controversy — at least Drawbaugh and Chellis did — about this suit and about this matter, but he never let on that he knew anything about telephones. Finally, he says that he never told any human being about listening through **D** and **E** until the morning he testified, and that then he told one of the defendants' counsel.

That man thought there was a market for that kind of testimony, and he proposed to supply the demand, and that is all you can say of him.

George A. May (brief, p. 474; app. 679), son-in-law of the blacksmith, Daniel Fettrow, is the other witness. He married

Fettrow's daughter in 1878 or 1879, and lived in Fettrow's house during all the controversy, and has lived right alongside of Drawbaugh in that village. I am not sure that he may not be a worthy rival of Andrew Evans, for stupidity. He testifies that he went to Drawbaugh's shop, and talked through a pair of instruments in March, 1875; and he knew that was the time, because he got Drawbaugh to sharpen a razor for him; and he knew that because, when he went to carry the razor to him, Drawbaugh was living in a particular house, which he moved away from in 1876, — the same house that Fettrow lived in. Well, that was quite as good as any other worthless association; but when we came to cross-examine him, he could not tell who he had worked for, nor the people he had worked with, since 1875; he could not tell the place nor give an accurate story; nor, in fact, twice repeat the same story. I don't mean men he did little jobs for, but men he regularly worked for. He could not tell whether he worked for a certain man in a certain year, and, in fact, he got all mixed up. But that is not all. There has been a good deal in this case of thrusting a particular instrument before a witness and asking him, "Did you see that?" "Did you see that instrument at the time?" That has been done all through their testimony in this case. There has been some little chaffing between counsel, in a pleasant way, on the subject; and when the witness, George A. May, came to be examined, they put before him quite a number of instruments, and asked him which instrument he saw at the time of this visit, — the only time he had any knowledge of the machine. He said that he saw **D**, **E** (the little magnetos), **F** (the tumbler) and **H** (the Blake transmitter). "Where was this (**H**)?" His reply was that it was fastened up against the wall. He was quite sure that it was fastened up against the wall in March, 1875. *But they do not pretend that that instrument* **H** *existed until eighteen months after that!*

May it please your Honor, those are the only two witnesses they could find, who dared to pretend to have listened at these two crucial instruments after two years' search, — a search that revealed, among two hundred and thirty-eight witnesses, only two such men as that. Could you get better proof against the existence of those instruments than the fact that under such stimulus, knowing the case would turn on that pair of instruments, they found only two witnesses who would testify as to any attempt to use those machines at that time? Why were not those witnesses produced before? Living right alongside of Drawbaugh in the same village during the whole of this controversy, of course they must have heard it talked of. Simmons was in the employ of these people. May had been working in that village all that time; he had been working for several witnesses for the defence in this case; he had had three years' gossip poured into his ears. "Had he ever been spoken to about it before?" "Yes." We asked him when (defts, iii, surbtl, 994): —

> "X Q. 140. When were you first asked what you know about Drawbaugh's talking machine?
>
> "A It was about two years ago" [that was about the time they were taking testimony in chief]: "Dan asked me whether I didn't mind the time he showed it [a talking machine] to me in 1875."

When asked this leading, suggestive and instructive question by Drawbaugh two years before, what did the witness answer? We don't know; but *they did not call him then.* He had been living in the village all the time; they could have called him before, but when they did call him, he swears he saw **H** in March, 1875, eighteen months before they pretend that it was made.

These are all the witnesses in the whole record who pretend ever to have talked through **D** *and* **E**. *Two of them swear to it before it was made; one of them heard no talk, but a song, and so on. Eight only in all; eight only out of three hundred and sixty-six called, and half of those eight discredited on the face of their own depositions* (brief, 473).

Now I want to call your attention to the testimony of witnesses who say that they *saw* **D** and **E**, but did not attempt to listen. On page 478 of the brief you have the citations; there are not many of them. What is the value of the testimony of a witness who says that he went to Drawbaugh's shop, was interested in his affairs, and spent five minutes, or ten minutes, or an hour talking *about* these two instruments, but never talked *through* them, — instruments which were always ready, no battery required, no adjustment necessary,— instruments that would work without the slightest trouble?

What do you think of such a witness? How are you going to believe a witness who says that he went there, was interested, talked for half an hour or an hour with Drawbaugh about these machines, and Drawbaugh puts one of them to his mouth and says, "This is the way you talk through it," and puts another to his ear and says, "That is the way you listen," and yet the witness did not put one to his own ear, or assist in the conversation which might be carried on through it, who did not listen to it, did not try to talk through it? You do not rest a case on the testimony of such witnesses. It was not these instruments that they saw.

Rufus K. Shireman (brief, 478; app. 79). — He says that in the fall of 1873 he first saw at Mr. Drawbaugh's shop **B** and **F** (the tumbler and tin-can instrument), which Mr. Drawbaugh told him belonged to the talking machine; but he did not speak through them. Not more than three or four months afterwards he made a second visit to Mr. Drawbaugh's shop and saw **B** and **F**, the tumbler and tin-can instruments, and talking machine, and he says that at that time he listened at a machine which he does not undertake to identify; he says, "It was fastened against the north wall of the building." He says he was standing away from the instrument, which was thus fastened up on the north wall of the building. Now there are none of those instruments that could be fastened up against the wall of a building. **H** was a transmitter, which could be fastened up, but it was not made until some three to eight years afterwards. No machine which is alleged to have then existed could be fastened up against the wall of the building; yet he says that the instrument he listened through was fastened against the wall of the building. There were quite a number of other witnesses who say that; but no such instrument existed. They have got something mixed up with it. A string telephone would naturally be so arranged. At later visits he says that he has seen various machines. He says that he saw **E**, **A**, **I**, and **D**. The defendants did not ask him when he saw them first. We did. We asked him what he saw at the time of his second visit, which he says was about three or four months after (not more than four months after) the fall of 1872; and he picks out **E**, **A**, **D** and **I**. One of those magnetos he says he saw at the second visit, not more than three or four months after the fall of 1872. As to **A** and **D** and **E**, the defendants *do not pretend that they were made* *for years after that.* Now does that witness simply wipe himself out, or does he shake your faith in the whole gang of them? On the face of it he appears to be as good as any of them.

Daniel Rupp (brief, 478; app. 121). — I do not know whether he swears to the time of this instrument or not; the date which he names is July, 1874, as I read it. If he gives any date at all, it is July, 1874. Well, they were not made then, according to their story. They confess that that was six months before they say they were made. He thus testifies to seeing them six months before the defendants pretend they were made. Whether he meant to assert that, or to assert no date at all, I am not quite sure; but your Honor will find out. He never used them; but his testimony has a good deal of value in one way. He was a member of the Mill Bush Company, — the company that made mill bushes in Drawbaugh's shop for some time. He was the treasurer, and was in Drawbaugh's shop in 1869, and spent a good deal of time at that shop, as the treasurer of the company. He had also been at Drawbaugh's shop a great deal about faucets. He had known Drawbaugh from boyhood, and lived pretty near him,— only a few miles off. According to his story, he had no knowledge of the talking machine until 1874. That looks pretty bad. He was engaged there in the shop, carrying on business in the shop, in 1868 and 1869, but does not pretend to any knowledge of the telephone before 1874. When they came to the surrebuttal, and were fixing up things, they thought they would fix up his testimony, so to speak; but they could not get Daniel Rupp on the stand again, and so they took the same course they had taken about the testimony of Henry Drawbaugh, but in a good deal worse way. They brought a man who says that he overheard a conversation in Daniel Rupp's store in 1871, about Drawbaugh telephone, but that Rupp was *not* present (defts, iii, surbtl, 378).

Jacob S. Shopp (brief, 479; app. 110) says that he saw **D** and **E**, but never talked through them. He thinks he was there in the year 1874 or 1875, but he has nothing to fix the date by. The defendants' counsel, in examining him, apparently tried to get him to fix the date by having him swear to the time when he had a pump fixed or repaired, and that he saw this when he came there for the pump, but the witness says that no such incident took place; "1874 or 1875" shows a recollection too vague to prove any date. He is a little worse in some respects than the other witnesses. He says that Drawbaugh told him, in the spring of 1876, meeting him somewhere, that he was going to exhibit his telephone at the Centennial. Now, no witness gives a hint of that except this fellow, and Drawbaugh does not pretend to. It has been published in the newspapers that he was going to exhibit at the Centennial *with a clock*, not a telephone (p. 97, *supra*).

W. H. Decker says that he saw and heard through **D** in 1874. So these two are witnesses who, if they prove anything, prove that they saw it before the defendants say that it was made.

Jacob B. Fry (brief, 480; app. 37), moved to Milltown, April 1, 1875, when he was about fourteen years of age. He says that, according to his recollection, he never talked through **D** and **E**,—at any rate, not at that time; that he did a little work for Harmon Drawbaugh, who was working for the Axle Company; and that, according to his recollection, it must have been about May or June, 1875. Well, on putting together the dates, the facts, and the sequences,—I will not stop to read all through the testimony,—it is quite plain from the incidents to which he refers, that the time of the employment there was in 1876, and not in 1875. In 1876 Harmon Drawbaugh (that is, Daniel Drawbaugh's brother) was doing piece work, and that was the time he employed this boy to help him, and not the time that he was employed by the day. The boy destroys their story or goes to pieces, or both.

C. E. Updegraff (brief, 483; app. 247) says that he saw **D** in April, 1875, and that he recognized it by the curled magnet. He is the quack doctor who talked with Zacharias at Hake's mill, a year before the time when Zacharias testifies that he went there; and who bought the provisions at the grocery store after it was blown up. Of course there was no "curled magnet" visible then if their story be true; the bottom was then on **D**, and the magnet covered. See pp. 187–9, *supra*.

Jonathan Balsley (brief, 483; app. 38) says that his wife died Oct. 22, 1875; and that soon after, to divert his mind, he went to Milltown, where he had formerly lived. He does not state whether he has been at Drawbaugh's shop at other times or not. He is a blacksmith. He remembers that he saw the instruments **F**, **D** and because he took notice of the curled magnet. I don't think your Honor will believe that he ever saw the curled magnet; he must be mistaken about that; and there must have been some confusion of ideas. He never saw the curled magnet, for the bottom must have been on. We refer to his testimony on page 484 of our brief. He stayed there an hour and talked with Drawbaugh about his inventions; was much struck with them; says that Drawbaugh explained the operation of the talking machine and all about the invention. He states that Drawbaugh put it to his mouth to show him how it was used, and that he put it to his ear; but he says that he never talked through it. Can you believe that? He might have done that with the tin can and with the tumbler, which would not talk. It is not possible to believe that kind of a story. It is not possible to believe that if he had any such instruments as **D** and **E**, he went through that performance and did not talk with them.

Daniel B. Condry (brief, 484; app. 43) stated that he has lived in the same place, about a quarter of a mile from Mr. Drawbaugh's shop, ever since September, 1875; that about Christmas, 1875, he saw some talking machines there, and thinks that **D** and **E** were two of them. He also stated that he had frequently been at Drawbaugh's shop since, and that he had seen there talking machines, but he does not identify anything else that he saw. He did not remember anything else. He was asked what business was carried on at that time, when he saw those talking machines, and as near as he could get at, it was the clock business. Now the clock business was carried on in 1877 and 1878; and the axle business was carried on in 1875. His deposition is not very definite, but what he thinks and what he remembers as to the time, as he puts it, are fixed by the time that the work he then saw was on clocks, and that did not begin there until some time in the summer of 1877. Nothing to fix any date by.

Jacob B. Shettel (brief, 485; app. 63) is a witness, of whom I have spoken, who was a partner in the clock business with Drawbaugh, and who at one time loaned Drawbaugh five cents and would have loaned him fifty dollars if he had asked it, but he never did (p. 216, *supra*). *He never attempted to talk through a telephone*. He was very frequently at the shop. Thinks he saw **D** and **E** "about

1875," but he cannot fix the date; he was unable even to state it any more definitely.

This witness hurt his character very much by his testimony about Drawbaugh's "poverty." He was a nephew of Drawbaugh's brother, and had known Drawbaugh from boyhood; a man of means, negotiating for a year about going into the clock enterprise, and did go into it; but he swears explicitly that he never heard Drawbaugh talk about patenting a telephone, and never was asked to advance money about one.

John H. Stephens (brief, 485; app. 76). — He has been a constant visitor at Drawbaugh's shop from 1870 up to the present time, sometimes twice a day, and sometimes two or three times a week every year; "sometimes I missed for a couple of months that I didn't get there" (ans. 22 and 23, defts, i, p. 232). He says that he saw **D** in 1875, but there is nothing whatever to enable him to fix the date. Did not use them. We introduced evidence which showed that in the fall of 1876 he returned from Drawbaugh's shop; said that he saw Drawbaugh at work on a talking machine, and mentioned it as an entire novelty.

That evidence was particularly from his hireling, George Rowe. Stephens testified that after he first saw the talking machine he spoke of it to his hireling and to his wife and daughters. He referred Drawbaugh to George Rowe as the hireling, and, in consequence of that, Drawbaugh saw George Rowe and inquired of him about it. George Rowe has testified that Stephens did mention the thing to him upon returning from Drawbaugh's shop, while he was hireling for him, and mentioned it as a novelty; but he never worked for Stephens except in the year 1876, and this incident took place in corn-husking time, October, 1876, and several months after the newspapers had been describing Mr. Bell's telephone. The defendants did not call Stephens's wife or daughters.

J. M. Wisler (brief, 486; app. 112) is a witness of the same kind. He had been at Mr. Drawbaugh's shop a good deal; had known him twenty years. Says that he visited Drawbaugh's shop in 1875, and saw these things, and that he put them to his mouth and ear, and that Mr. Drawbaugh showed him how they were used, but did not talk through them.

George L. Hale (brief, 486; app. 134) is another witness, still more vague, who can bring nothing to fix the date in his memory. He thinks that he went there in 1875. He was employed near Milltown. He has no recollection of having been there afterwards. He is a man whose deposition cannot, in the nature of things, be directly contradicted, and is therefore weak. He has heard these stories, which everybody had heard in that neighborhood and county for the last four years, and has got things confused.

What he says he saw was **C**, the breastwork instrument with the large permanent horseshoe magnet. He professes to recognize it chiefly by the magnet. Undoubtedly what he saw was the magneto key, the most conspicuous thing in which was just such a large horseshoe magnet with an electro-magnet at its end.

Jacob R. Vanasdale and *Jacob R. Ensminger* (brief, 486; app. 668–9). — These two men say that they were employed in the neighborhood of Milltown in February, 1875, which is likely enough, although the statements they make about their employments together do not agree with the book they produced. They also state that while there employed they went to Drawbaugh's shop and saw some parts of machines not put together, and think they recognize the curled magnet of **D** as one of those parts. They are men of the neighborhood. Whether they had been there at any subsequent time or not, and what they did see when they were, rests purely upon their memory. The value of their testimony rests entirely upon the excellence of their memory and their veracity. In the nature of things, we cannot directly contradict it. It is therefore specially significant that they are eleventh-hour witnesses, called in the last year of the case to a point that needed much bolstering.

W. H. Bates (brief, 487; app. 119). — In many ways an interesting witness — a sample witness. He was a blacksmith and carriage maker. He had been a friend of Drawbaugh's for many years and had worked for the Faucet Company in the fall of 1868. In 1872 and half of 1873 he was away living in the West, and then came back to the neighborhood. He says of Drawbaugh (ans. 24): "We were very intimate friends, and I went to see him pretty often and we exchanged opinions about mechanism."

From 1874 to fall of 1877, Drawbaugh did a good deal of work for him turning axles. He thinks that in 1875 he saw D and E, yet he never talked through a talking machine in all the years he visited at Drawbaugh's shop. Now to begin with, the fact that such a man, who was intimate with Drawbaugh under such circumstances, and who had worked for the Faucet Company, should know nothing of this thing until seven years after, is remarkable. His story may or may not be true, but is it possible, under these circumstances, that he never heard of or saw the talking machine during the time of the Faucet Company, or before 1875, if there was one there freely shown? Is it possible, if there was a machine there that talked, that he never saw it, and never tried to talk through it?

I hope the Court will look at the deposition of this witness carefully, especially as examined in our brief, pp. 487–9. He is an example of a witness who professed to have known all about all Drawbaugh's inventions, and who, from his intimacy with Drawbaugh, must have known of all of them; and from the fact that it was mechanical subjects which generally engaged their attention, he would certainly have used them Yet his story is, that, though they must have spent days in talking about the telephone, he never talked through them; and further, although we know (p. 155, *supra*) of the things that Drawbaugh was working upon during the very time when this man frequented the shop, such as his magneto key and all his other contrivances, there is no trace of them in this man's memory. He testified: —

> "*A.* 23. His general conversation was about talking machines: several times that I was there his mind seemed to be taken up with it. He said he would like to get it patented, but he hadn't the means to do it. He said he could make a fortune out of it."

It is perfectly plain that he is of those who find in their minds that Drawbaugh was always busy upon inventions, perhaps upon electrical inventions, and now transfer the whole to the talking machine, which they never heard of till afterwards. It is perfectly certain that if the talking machine occupied that place in their discussions which he now pretends, and D and E and the microphones existed, he would have talked through each of them the first instant he ever went there.

That is all the proof there is to sustain D *and* E. I have named over all those who profess to have seen or talked through these machines before the date of the Bell patent, — nineteen or twenty in all. Now, let us see what there is *in their own record to disprove their statements.* In the first place, the occupants of the shop during that time (particularly during the time the Axle Company carried on business there, from the beginning of 1875, when they began to put their machines in, until the fall of 1876, when they stopped) could not have helped knowing about these machines and using them if they existed. There were four partners in that concern, which was built on a patent; two of them went out in the spring of 1876, and the other two remained until November, 1876, and they were doing some active business until late in that fall, but I do not know exactly when; they certainly were in September, 1876. Mr. Moore thought that they worked actively there three or four months after the two partners went out. Afterwards, when the paper of dissolution, dated Nov. 18, 1876, was put into his hands, he said he had not remembered it was so long. Fettrow has a charge against them of blacksmith work in September, 1876.

Thus the concern existed until six or eight months after the Bell patent of March 7, 1876. That Drawbaugh had some instrument there at some time during that period, — for example, the rudimentary tin-can instrument **B**, — does not help the defendants. They must show that during that period he either had such refined and perfected instruments as would necessarily imply a long ancestry, or, if their proof goes to the tin can, it must prove its existence during the *first* part of the Axle Company's time, — and then it is not a talking isnstrument. Now, the proof from the Axle Company is perfectly fatal to them precisely in these respects. It shows that there was nothing better than the tin can **B** there during the whole of that period.

The Axle Company was a partnership of four members: Kline, the patentee of the axle; Kline's son-in-law, Capt. Moore, who had been the owner and manager of the Soldiers' Orphans' School, a school with two or three hundred pupils, situated about a mile and a half or two miles from Drawbaugh's shop; M. N. Gove, and Wilson Bear. In the beginning of 1875, Mr. Moore sold out his interest in that school and proceeded to go into that axle business, putting into it two or three thousand dollars. They fitted up Mr. Drawbaugh's shop with the additional tools and machinery specially needed for this purpose, and employed Mr. Drawbaugh to make machine tools which were necessary to the manufacture of their axles. They were people, therefore, who were friendly to Drawbaugh and appreciated him; who knew his skill as a mechanical inventor, and that he was an ingenious man, a good mechanic, and a good workman. They employed him steadily for a year or fourteen months, and paid him $440 and allowed him to do some work for himself besides. Those men ought to know all about whatever telephones there were; they must know all about them. They were there during the time when Mr. Drawbaugh says he had these machines **D** and **E**, and all these microphones. Those instruments could never have passed unnoticed. They were there when Mr. Bell burst upon the world in the summer of 1876, and became famous everywhere, and Mr. Drawbaugh of it, *yet no one of that Axle Company ever talked through a telephone, or pretended to listen at one, or was asked to talk through one, or ever saw any machine rigged up to talk.*

Capt. Moore (brief, 501; app. 204) says that at some time when he was there, Drawbaugh showed him the tin can; or rather, as he says, Drawbaugh showed him what he said was a talking machine, and said that it was to take the place of a fire alarm in cities. Then the defendants, in examining him, put the tin can **B** before him, and asked him whether he recognized that as the one that he saw; and he said that he did; that the one that he saw was like that, but he did not pretend to identify any other machine, not even the tumbler **F**. He did not see any other machine, though he says that some time while he was there he saw Drawbaugh working on some parts; that he had no conversation with him about them, nor what they were for, but he rather supposed that they related to the talking machine; and that is all he knows about it. Mr. Drawbaugh, he says, asked him if he would put some money in; if he would advance some money to help him patent the machine, and under those circumstances showed him the tin can **B**; and he says, on direct examination, that the bladder was then on it. The tin can **B** is plainly all he ever saw. Now Drawbaugh's express testimony is that when he made **C** and **I**, the tin can **B** became superseded. You cannot doubt it from the nature of the instruments, but he says specifically that

that instrument **B** had been superseded; that the tin can had gone to the garret, and that the mice had eaten off the membrane soon after, when this better instrument was made. Tin can **B** is the only instrument shown to Moore during 1875–6, and he states that *when he saw the instrument the bladder was on it.* Now, if that is a fact, his testimony absolutely displaces the other instruments. Against the defendants it is a fact. Not only does their witness Moore swear to it; not only do they fail to contradict it; but Drawbaugh, in taking Moore's deposition, put **B** before him and asked him if that was not what was shown him *and with the bladder on* (defts, i, p. 650, ans. 26–7). *That is Drawbaugh's statement* as well as Moore's.

Wilson Bear (brief, 509, app. 215) was another member of the Axle Company; he said that he had no recollection of any instrument but **A**; thinks he saw **A** before the Axle Company began; he could not recognize anything, and did not know whether he saw anything else or not, never tried to use one. Finally, he says that Mr. Drawbaugh "must have talked to him about his talking machine," because *he had talked to him about his other inventions.* That shows the state of mind of the witness. He had not the slightest recollection of anything; but he is brought to such a condition of mind that *he assumes the fact* and says, "Of course he must have talked to me about it, because he talked to me about his other inventions." He says this, although he has not the slightest recollection of the fact. Mesmerized.

Michael N. Grove (brief, 409; app. 226), another partner, was a very stupid fellow. He could not tell where he lived at a particular time, about 1874–7, and mixed up the houses he had lived in. He testified that while he was concerned with the Axle Company, and he thought in the beginning of 1875, Mr. Drawbaugh said he had a kind of box to talk to Pittsburg with. Then instrument **D** and one of the other instruments were thrust before him and was asked if they were the ones he saw; he replied that he thought they were. But on cross-examination we asked him when he had been at that shop since February, 1876, and he said he had no recollection when he was last there. That was all they could get out of him.

Jacob Kline, the other man, the inventor of the Kline axle, the man who ought to know all about it, is not called by them. His relations with the defendants are such that they would have called him if he could have helped them. It is a fact proved in the case that since this controversy began he said that he knew nothing about the telephone. Brief, pp. 266, 509.

Capt. Moore's testimony is the most important. He says that a talking machine was referred to, and he was asked if he would not aid in getting out a patent; and he was shown the tin can *with the bladder upon it:* and *that is the only instrument he saw during that time.*

The exhibition of the tin can **B**, and that alone, under such circumstances, with the fact that, according to Drawbaugh's explicit testimony, the membrane of **B** was destroyed soon after the next was made (alleged to have been in 1869), with the fact that Moore was never asked to talk through any, although he was there long after Mr. Bell became famous, are positive aggressive facts, proved by the defendants' own record. They absolutely exclude from that period all real speaking telephones, and especially such refined instruments as **D**, **E** and the small microphones and the Blake transmitter **H.**

With such proof in the defendants' own record, the Court, as matter of law, cannot find what is here needed to enable it to believe the defendants' story or make out their defence. (See this fully in brief, pp. 501-512.)

There is but one other witness so important in their record, and that is *H.C. Springer* (brief, 461, 494; app. 52), a shoemaker, who moved to Eberly's Mills, April 1, 1876, and lived there until the end of the year 1876. That was the only time he ever lived there. He says that while living there, and soon after he went there, he and Drawbaugh were continually experimenting on talking machines, and that he used to go down to Drawbaugh's shop nearly every night for the purpose of aiding in his experiments on the talking machine. He says that for the first two months while they were there (and this was at the time when the Bell patent was three months old) the only instruments they used were the tin can **B** and tumbler **F**; that is, they alone were used for three months after the date of the Bell patent. Then he says that after that Mr. Drawbaugh said to him, "Now come down; I have got a new thing that we can talk both ways through"; and then showed him **D** and **E.** Is that true or not? The defendants tried, *when he was on the stand the next day,* to get him to modify that a little, and asked him whether **D** and **E** when he saw them did not look dirty and old, and he said he thought they looked about as they do now.

The gist of that part of his statement is that **D** and **E** were then produced as novelties. But the strongest part of his deposition is that for *three months after the Bell patent, Drawbaugh used the tin can and tumbler, and nothing else.* Whether that is true or not is another question; that is what their witness says. They ask him about **A**, which they say preceded **D** and **E**, and whether he did not see it; he says that he never saw **A** and thought that it must have been made after he left. Will your Honor believe that witness or not? He is their witness. *Against them these are facts.* They insist that you shall believe him. What do they do about it? Did they examine Mr. Drawbaugh and let Mr. Drawbaugh contradict that statement? When Drawbaugh got to the witness stand afterwards, they called his attention to Springer's statement. There were two things which had got to be displaced to save their case. They had got, in the first place, to get rid of a fact that their witness had sworn to, — that **D** and **E** — the first that will really talk — were produced as novelties when the Bell patent was three months old. More than that, they had to get rid of the fact, or what was a fact as against them, that the tumbler and the tin can were the two things used for the first three months and used every night. Now, a man might forget dates, but that is a thing that he would not forget; so they asked Mr. Drawbaugh about it. I read now from page 463 of our brief, and I invite your Honor's attention to it. It is quoted from Drawbaugh's deposition (defts, ii, 903): —

"*Q.* 644. Henry C. Springer testified, on page 191 of defendants' printed record, that, about two months after April 1st, 1876, you showed him the two little magneto instruments '**D**' and '**E**,' and told him that you had improved the machine, and could talk both ways then; and that the first instruments that you showed him during the two months prior to that time would only talk one way. Were the two little magneto instruments, '**D**' and '**E**,' the first instruments that you made that would talk both ways, or not?

"*A.* No, sir; I had other instruments; instrument '**C**' was one and 'I' was another; but '**C**' was not as well adapted as a receiver as it was as a transmitter: I suppose I wanted to have him understand that those small magneto instruments could be handled more easily from the mouth to the ear."

That is the only reference to Springer that Drawbaugh makes in his whole deposition. Now, there is the fact, sworn to on direct examination by their own witness, that for three months after the Bell patent Drawbaugh used only the tumbler and tin can instruments **F** and **B**, and afterwards produced **D** and **E** as novelties. Nearly eight months after Springer had so testified, they put their man, Drawbaugh, on the stand, and did their best to turn that corner; yet all that he could say was that **D** and **E** were not the first magnetos. They did not pretend to deny the other facts (facts as against them), to wit, that **F** and **B** were the best for three months, and afterwards the first magnetos (all the better for us if they were **C** and **I**) were produced as novelties.

Suppose we ask Drawbaugh when these magnetos **D** and **E** were made. He ought to know. I will read all his testimony which professes to give any date to **D** and **E**. First I will read from the direct examination of Daniel Drawbaugh (brief, 457, defts, ii, 827): —

> "*Q.* 265. Mr. Harmon K. Drawbaugh, a witness heretofore examined for defendants, has testified, on p. 579 of defendants' printed record, that these instruments, '**D**' and '**E**,' were made in January or February, 1875, before the Axle Company received its new machinery in March, 1875; have you any recollection of the fact or not?"

Think of that! To call your own prior inventor, and, when he comes, not to ask him, "When did you make those instruments?" But, "I tell you that they were made at a date which will save this case: have you any recollection about it?" He answers: —

> "*A. I have no recollection of the time,* but I recollect of him working on the machine; one of them was made before that time; what I mean is, there was one of them made, and Harmon made, or helped to make, the other; it has been quite a long time ago; I *can't remember the year* or date of it."

But more than that. Then they went to work again to try to prove by his testimony when he first produced real telephones. They asked him (brief, 458; defts, ii, 861): —

> "*Q.* 400. Had you, or had you not, invented and made operative electric speaking telephones prior to the time of the opening of said Centennial Exposition?
> "*A.* Yes, sir; I had."

That was not a proper question. The question should have been, "What did you make?" He had already sworn that the tumbler and tin can were operative instruments. If he believed that, then answering in that sense, their existence is all that his answer means. That is the only answer in his whole deposition which *purports* to state a case against us. It purports to do so only because it assumes that which the Court has to decide. When he mentions the tumbler and tin can, and gives what he approximates as their date, he states what the instruments were, and the Court now knows that they were not an operative telephone. Then they asked him (brief, 459; defts, ii, 861): —

> "*Q.* 401. Please indicate all the electric speaking telephones that you had invented or made prior to the time when the Axle Company composed of Bear, Grove and others, commenced their operations at your shop. I mean of all the instruments in evidence and including the cup transmitter. Which ones of all these had you invented and made prior to the beginning of the Axle Company?
>
> "*A.* The teacup instrument, the tumbler instrument, Exhibit **F**, the tin can instrument **B**, instrument Exhibit **C**, instrument Exhibit **I**, and Exhibit **A**, and the magnetos, Exhibit **D** and Exhibit **E**; those are the instruments, as near as I can recollect, and I had modifications of these instruments; I won't positively say that **D** and **E** were prior to the Axle Company, but I know that at the time the Axle Company was running I had them there; it may have been prior to the starting of the Axle Company; it may be, but I don't want to be too positive; I refer to Exhibit **D** and Exhibit **E**."

That is all that Drawbaugh, the claimant, the inventor, can tell you about the dates of these instruments. Whether they were made in 1875 or 1876 will turn this case, and he does not know in what year they were made. Find it out for yourself, he says; I don't know. Does your Honor?

What help does their record give you? Capt. Moore, perhaps on the whole the most intelligent man they have, was there during the whole of 1875, and substantially all of 1876. He never saw **D** and **E** or any other microphones. They asked him what he saw. No, they did not even ask him what he saw. Drawbaugh, through his counsel, said to Capt. Moore, was not this tin can **B** the thing I showed you, and Capt. Moore says "yes." It is Drawbaugh's statement that that is all he showed to Capt. Moore, and Capt. Moore's assent to it. There is nothing in Capt.

Moore's testimony fit to turn the date to the earlier part of the Axle Company's occupation rather than the latter part; but if there were, *the fact that* **B** *is all that Drawbaugh says Capt. Moore saw*, and all that Moore thinks he saw during the whole time of his occupation, displaces the only instruments on which this case can turn.

Springer's story, if the facts be as stated by him, is fatal to the case. After that testimony from those two men had been put in, they came to Drawbaugh. "I cannot remember the year of it," he says; "I don't know the date of it." Your Honor must instruct this inventor and not he you, when he made the instrument on which this case is to turn. From whose teaching will you instruct him? Why, they have given you the testimony of such men as Simmons and May and Decker to help you. You have got to find that you know clearly and beyond any doubt something which Drawbaugh does not know, and which Springer and Moore in the strongest manner, with the most corroborating circumstances, swear is not true.

As matter of law there is no question open here to be discussed.

Well, this is not all. Drawbaugh knew when he had made those. In the spring of 1878 he could hardly have forgotten that he had those in 1876, if that were the fact. In the spring of 1878 he could hardly have forgotten when it was. In 1878, he knew whether he had those a year or eighteen months before he heard of Bell's invention, and if he had them so early there was no doubt about his antedating Bell. But in the spring of 1878 we find him stating the fact that he did not antedate Bell. Moffitt then knew that he could not antedate Bell; and Moffitt now says that he saw those things, but could not tell when he saw them at his shop. *Springer and Moore proved that those things,* **D** *and* **E**, *did not exist until after the Bell patent.*

Drawbaugh, brought up face to face with that, says, in effect, "I am ready to profit by what Decker and those fellows say; but I will not say when those were made; I will swear that I do not know in what year those were made; let the Court find out."

In 1878 he said, "I had not got anything that would talk before Bell." In 1879 he was getting a little nearer this case; he was preparing himself, one might almost think. A year earlier he *knew* he

Mr. Bell's patent. Mr. Shapley pointed it out to him in October, 1876, and gave him the paper. Drawbaugh related this on cross-examination and redirect examination; it is on p. 204 *et seq.* of the brief. Drawbaugh, in his own deposition (defts, ii, 1094), says that Mr. Shapley pointed out this article in the *Scientific American* and handed it to him, and says, "He told me that was something of the nature of the machine I was working at then." This was in October, 1876 — after Mr. Shapley had been shown the tin can but nothing else in the way of telephones. Drawbaugh says Mr. Shapley gave him the paper and "told me that" [the Reis machine] "was something of the nature of the machine I was working at then." Drawbaugh kept the paper and produced it on the witness stand, so there is no doubt about that incident.

The existence of the tin can in October, 1876, does not mean much as against us; but it is worth noticing that before that time, and on Sept. 9, 1876, the *Scientific American* had published a very poor description of Bell's telephone, *describing it as made of two tin cans.* There was nothing in the tin can, therefore, that could startle Mr. Shapley. That went on, and Shapley talked about putting money in some of Drawbaugh's things. He was a man of means; yet from the beginning to the end, Drawbaugh never so much as hinted to him that he was the inventor of the speaking telephone. Bell's invention came out and made an enormous noise in the world at that time, and he spoke of this and handed to Drawbaugh a description of the Reis telephone; and, referring to the Reis, which could not talk, which the inventor desired to make talk, but could not, he said to Drawbaugh, "That is something of the nature of the thing you are working at *now.*" Mr. Shapley said this to Drawbaugh. Those are the words as Drawbaugh reports them. Did Drawbaugh then burst out, "I have worked at this thing for years; I wanted to make it talk. I did make it talk perfectly years ago and ever since. I have my shop filled with microphones?" Not a bit. If he had all these things, the microphone, and so forth, for years, he would have said, "I have had these things for years; I will put them in my pocket tomorrow night and bring them into your store and astonish you." But not a word of that. He had showed him the tin can before; he showed it afterwards, and that is all. Mr. Shapley took note of that. He mentioned it the next year to C. A. Landis. If there had been anything more, or if Drawbaugh had said he was the originator, Shapley would have noticed that. But to this man with money to invest, the tin can alone was shown. That is all those circumstances brought forth. Here was the man who had got this perfect machine, anxious, heartbroken, because he could not get somebody to look at it, showing it to all the farm laborers who came in; but he does not show it to Mr. Shapley, or to any man of that class; does not tell him he has any such thing; does not have him talk through the machine.

Charles A. Landis (brief, 205; app. 421–423). — He is brother-in-law of Mr. Shapley, and in the next spring, that is, the spring of 1877, he went to Drawbaugh's shop, and Shapley told him to see Drawbaugh's talking machine. Drawbaugh showed him the tin can **B**. He says that when Drawbaugh showed it to him he pointed out this little piece of metal in front which is fastened by a screw passing through a slot in it, — fastened underneath the wooden block which carries the electro-magnet, while this front end, which is sharpened, is bent up so that it is opposite the centre of the tin can, where the centre of the membrane would have been. That makes a Reis transmitter. Attach to the centre of the membrane a little patch of metal; connect that by a wire with one pole of a battery; take a wire from the other pole of the battery and carry it to this little hole which you see in the tail end of the strip I have described, — I mean the little hole in the wider end which rests nearly on the base board, — and then, by means of the adjusting screw in the slot, bring the upper point of this little bent piece of metal up so that it just touches, or almost touches, the patch at the centre of the diaphragm. Whenever they touch, the circuit is closed and the current flows; whenever they part contact, the circuit is broken and the current is interrupted. Now, speak or sing into the tin tube and the air vibrations make the diaphragm vibrate to and fro, and this alternately makes and breaks the circuit and interrupts the current just as the Reis transmitter did. It is a rude and not very good contrivance of course; still it is essentially a Reis transmitter. Each time the circuit is broken you have a spark at the point of contact, and this would quickly burn out and destroy the point if made of any ordinary metal; for that reason all such contact pieces are always made of platinum, — a metal so refractory that it will stand the electric spark without injury.

Drawbaugh showed this contrivance to Landis, pointed out this little piece, *described it as a thing which would make and break the circuit*, and said that that point ought to be of platinum. Landis testified to this, and Drawbaugh does not contradict it. It is a very important statement, and if not true, why does not Drawbaugh come on the stand to contradict him? It does not quite stand alone. One of the witnesses, George Drawbaugh, a witness, indeed, of so little knowledge that we should be sorry to trust much to him, says, nevertheless, that when he saw the tin-can instrument there was a wire fastened to the middle of the bladder. When did Drawbaugh make this? Did he make it before he saw the Reis description, which Mr. Shapley showed him in October, or not? I don't know; there is no specific evidence about it, and Drawbaugh does not go on the stand to tell us, except that he did swear in direct examination, before this matter was put in evidence, that he never made a circuit-breaker instrument. It is pretty plain that they felt they had got to try to get any idea of a circuit-breaker out of this case, and pretty plain that he had got to account for this little piece of metal, *which never could have been used except to make a circuit-breaker*. He undertook to do it by asserting that it was a spring (defts, ii, 797). That is absolute nonsense. He says it was a spring to give additional elasticity to that stretched membrane. That is absurd. This man was a very good mechanic. What can you think of the idea of his taking a piece of tin, which has hardly any more elasticity than a piece of putty, and using that as a spring, not merely a piece to yield, but as a spring which should give additional elasticity to a stretched membrane? No one would do this, least of all a good mechanic like him. You might as well try to make a caldron boil by pouring in a wineglass of lukewarm water, as call that piece of soft tinned iron a spring to give additional elasticity to a stretched membrane. Whenever it was made, there is not the slightest doubt that the thing was a circuit-breaker, and was made and used as a circuit-breaker.

As a circuit-breaker it would not be necessary to have the electro-magnet on the machine. Landis does not remember seeing it, though he is not positive whether it was there or not. But if you wanted to use the circuit-breaker transmitter, you must have a receiver for it; and the tin can with the stretched membrane and electro-magnet would make a very fair receiver; and an instrument just as **B** is now with this little bent piece of tin and the electro-magnet also could be used both as a transmitter or a receiver, and if he made two of them (and one witness, David M. Ditlow, says he did have two tin cans, one at each end) he could use one at each station alternately as transmitter and receiver. That instrument he certainly had.

Mr. Charles Landis says that Drawbaugh described to him the results which he got, and said that when he pronounced a long word like "Philadelphia," he got the sound of the first syllable, but after that every syllable of the word sounded the same. That is just the description which would be given of it. It is what would happen. A man who thinks he has got a talking machine of that kind will think he recognizes the sound, but he will find that every syllable is just the same; each syllable gives, so to speak, a puff of sound, and they are all alike. That is just about the result a sanguine man would think he got from that kind of an instrument.

I spoke to your Honor yesterday, or the day before, about Mr. Bell's exhibition at the Centennial, and I read or stated something that was said about it by Prof. Henry and Sir William Thomson. After describing the instrument, Prof. Henry said in his official report (complts, i, 236): —

> "This telephone was exhibited in operation at the Centennial Exhibition, and was considered by the judges the greatest marvel hitherto achieved by the telegraph. The invention is yet in its infancy, and is susceptible of great improvements."

Sir William Thomson said soon afterwards to the British Association (complts, i, 240): —

> "Who can but admire the hardihood of invention which devised such very slight means to realize the mathematical conception that, if electricity is to convey all the delicacies of quality which distinguish articulate speech, the strength of its current must vary continuously, and as nearly as may be in simple proportion to the velocity of a particle of air engaged in constituting the sounds?"

"Who can but admire the hardihood of invention which devised such very slight means to realize this mathematical conception?" How could a man realize that mathematical conception unless he had it?

Now, we know what Drawbaugh's knowledge was. They have asked him his knowledge of vibrations; they not only asked him, but they asked Harmon Drawbaugh to tell what his uncle told him about it. All he knew in regard to vibrations was that the more frequent the vibration, the higher the pitch (defts, i, 574; ii, 793). That is the knowledge of Reis. That is the knowledge of any child who attends a singing school — the more vibrations, the higher the pitch. Drawbaugh knew that the more frequent the vibrations, the higher the pitch. That is what he knew, and that is his story. With that knowledge you cannot transmit speech; but you can fail as Reis did.

May it please your Honor, you have got to believe that this man got a speaking telephone without the knowledge necessary to acquire it, and that when he had made it, he did not use it. How do you find out whether a man has got an invention? Do you want to know whether Mr. Bell invented the speaking telephone? Ask him. Is there any doubt about his results. Ask him, and he can reply in the words of Sir Christopher Wren's epitaph, "Look around you." St. Paul's dome is not more visible than Bell's work. Ask Drawbaugh. Nobody ever learned from him how to transmit speech. Nobody ever used an instrument that he had made. He says, "I never used one myself, except for the purpose of experimenting and to gratify curiosity."

[*Intermission.*]

Mr. STORROW. — I find that I have omitted to say anything about Mr. Bell's second patent, though I meant to. It is for improvements in the apparatus to make it better accomplish the same result in the same way. I do not think it important that I should discuss it. If the Drawbaugh story be true in its whole length and breadth, it will destroy this patent. If you find it substantially untrue,—so untrue, that it cannot touch the main invention,—you will not think that you can find a little certain truth in a mountain of falsehood.

United States Circuit Court,

SOUTHERN DISTRICT OF NEW YORK.

AMERICAN BELL TELEPHONE COMPANY ET AL.

v.

THE PEOPLE'S TELEPHONE COMPANY ET AL.

ARGUMENT OF E. N. DICKERSON, Esq.,

FOR COMPLAINANTS.

BOSTON:
ALFRED MUDGE & SON, LAW PRINTERS, 24 FRANKLIN STREET.
1884.

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United States Circuit Court,

SOUTHERN DISTRICT OF NEW YORK.

IN EQUITY.

AMERICAN BELL TELEPHONE COMPANY ET AL.
v.
PEOPLE'S TELEPHONE COMPANY ET AL.

BEFORE HON. WILLIAM J. WALLACE, *Circuit Judge.*

ARGUMENT OF E. N. DICKERSON, ESQ.

NEW YORK, Sept. 30, 1884.

Before Mr. Dickerson began, Mr. STORROW said, —

Mr. STORROW. — At the close yesterday, the defendants asked about a letter of Mr. Matthews, which I now propose to read.

Mr. Matthews originally made an affidavit in this case for the motion for a preliminary injunction. His visit to Drawbaugh's shop and his article in the *Baltimore American* were in 1878. This affidavit was made in October, 1880. It was drawn by Mr. Matthews himself, at home, alone. He had himself practised law for some years. He preferred to draw it himself, in order that he might be sure that it stated his own recollection and used his own expressions. That is the way it was drawn. It was then copied by a notary and signed and sworn to by him. That was, therefore, within less than two years after he wrote the article.

In the summer of 1882 he gave his deposition at Baltimore. On that deposition I put into his hands the article and asked him if he wrote it. It had already been placed in Drawbaugh's hands on his cross-examination. I asked Mr. Matthews whether the statements in that article were according to his recollection at the time he wrote it, and whether they were still according to his recollection; and I then asked him to state what instruments he saw at Drawbaugh's shop. I particularly asked him whether he saw the tall instrument H, with the bell on it, and he said he had not.

He was then cross-examined at considerable length as to the details of that interview.

In December, 1883, eighteen months or seventeen months after that, I received a letter from him, which I will read presently. I was in Harrisburg at the time. The letter had been sent to Boston and forwarded to me at Harrisburg, and I immediately went to Baltimore to see Mr. Matthews, as he had asked me to do in the letter. I went to the newspaper office, where I had been before, and where his letter was dated, and they told me that in the preceding summer he had left the office, having been overcome by the heat or sunstroke, and had not done any work since, and was in an uneasy frame of mind, and it was doubtful when he would do any more work.

I went immediately to Mr. Matthews's house and saw him, and it became evident to me (I do not mean to say that he was out of his mind, or anything of that kind, for he was not at all) that he was in an unnatural and morbid condition of mind. I had some conversation with him, which I will state to the Court if desired, but not otherwise. It did not differ materially from the letter.

He spoke to me of a legal gentleman, an old and intimate friend of his, a well-known gentleman of high standing, and whom he had talked with. I went to that gentleman's house, introduced myself to him, and told him my relations to the case and my interview with Mr. Matthews. He said he had seen Mr. Matthews, and he agreed that his condition of mind was just what it appeared to me, and that he was in a condition of mind where he was unduly disturbed about trifles. The matter referred to in his letter was the merest trifle.

The letter, which I have in my hand, is as follows:—

BALTO, Dec. 1, 1883.

Office of BALTIMORE AMERICAN,
Cor. South and Baltimore Sts.,
BALTIMORE, MD.

(PRIVATE AND CONFIDENTIAL.)

MR. J. STORROW:

Dear Sir, — What is the status of the case of the Bell Tel. Co. against The People's Tel. Co.? In what Court is it pending, or has a final decree been reached? I have recently become impressed with the conviction that there are several wrong statements in my deposition taken before Commissioner Ott, which may affect the decision of the case, although a legal friend tells me that my whole testimony is immaterial, and would scarcely be considered by the Court at all. I believe it is not the policy of the law to allow a witness to correct his testimony merely for the purpose of relieving his conscience; but where the matter is material, and affects great interests, I think that, if application is made before the taking of testimony is closed, the Court will allow a new deposition to be taken, and, even if a decree has been reached, an affidavit disclosing a great mistake in the testimony, will form ground for a new trial. Of course the witness puts himself in peril if he has sworn falsely to a material fact. It is still my firm conviction that Drawbaugh had no telephone in operation when I visited his shop, and that he did not show me any such instrument as was exhibited to me when my deposition was taken, marked H. I am also clear in my recollection that he did not set up any claim to be the original inventor of the telephone. In the paragraph devoted to the telephone in the article published in the *American*, I think I gave him credit for all and possibly more than he claimed. I ought to have said however in my affidavit, and in my subsequent examination, that at the time of the interview I had probably never seen a working telephone, and knew little or nothing about its mode of operation. The impressions in the newspaper paragraph referred to may have been colored, modified or changed by conversations with other people on the subject after the interview and before the article was written. This, however, is not the matter that troubles most. In my affidavit I mentioned two wooden hemispheres shown me by Mr. Drawbaugh as parts of a telephone with which he had been experimenting. After mature reflection, I cannot remember that Mr. Drawbaugh said anything about these hemispheres. They came under my notice while Mr. Drawbaugh was showing me something, and while the telephone was under consideration, and I connected them in my own mind with the telephone, but I cannot say that Mr. Drawbaugh touched them or said anything about them. My present recollection is that he did not, although, in the cross-examination, when my deposition was taken, I placed these pieces in his hands. I have had no communication with Mr. Drawbaugh or with any one connected with the case, and I have no more information now than I had when the testimony was taken; but I am constrained to think that the portion of my testimony which makes him exhibit to me these pieces as parts of the telephone ought to be excluded. My recollection of the whole transaction is so vague that I never ought to have ventured to say anything about it; and the portions of my testimony relating to the matter certainly ought not to be considered by the Court when making up its decision, although it may be in accord with other testimony of a more positive character. My recollection of the conversation about Bell and Edison is also very vague, but my testimony is probably substantially true as to what was said. It would be better, however, if the whole could be excluded. I am in some distress of mind about this matter, and should be glad to hear from you without delay. I had no possible motive to testify falsely, and I have no motive in seeking to make the correction, except to put myself upon a solid basis of truth. If the interests of any of the parties are likely to be injuriously affected by the testimony to which I have referred, then I think it ought to be corrected at every sacrifice. My address is 303 Hollins St, Balto, Md.

Respectfully,
JAMES P. MATTHEWS.

Mr. Storrow. — It appeared to me, as I presume it appears to every one, that the thing which Mr. Matthews was called to prove, to wit, that he published that article containing those statements about the origin of the telephone, and that what he had there stated was true, was abundantly confirmed by the letter, and that the question whether the thing actually shown were a telephone or not, and which his conscience had taken hold of, was a matter entirely immaterial and had nothing to do with the case. Here is the letter, your Honor (handing the letter up to the Court).

The Court. — This letter is not a part of the case, of course. It is certainly a very creditable letter to the witness, who was anxious not to have a statement presented which should in any respect have deflected from the true facts as he had them.

Mr. Hill. — All I desire to say is this: that there is no question but that the gentleman is in his right mind now.

The Court. — The letter shows clearly enough that he was in his right mind at the time he wrote it.

The Court to Mr. Hill. — Have you any objection to this letter being made a part of the record?

Mr. Hill. — No, sir.

The Court. — It will go into the record.

ARGUMENT OF E. N. DICKERSON, ESQ.

Mr. DICKERSON. — May it please your Honor, the cause which has been committed to my care by Mr. Bell is the most important ever heard in this or any other court in the United States, involving merely private interests. It is the most important in respect to the magnitude of the case itself; the number of persons who have testified; the apparent conflict of testimony between the two opposing sides; and it is the most important in respect to a great reputation which stands in some sense depending upon it; and in respect to the pecuniary consequences which are involved in its decision.

Nominally, it is a case between a corporation in Boston and a corporation in New York seeking the privilege of making and putting upon the market the telephone. Actually, it is a controversy between one hundred thousand people on the one side, attempting to defend their rights against encroachment and piracy in which one hundred millions of dollars are involved. There is no village in the United States having a population of 5,000 and upwards, in which there is not established a telephone plant, put there by the capital of the people around it, invested upon the confidence which the community has had, and has had a right to have, in the stability of this patent and in the title under which they hold their licenses. From the shores of the Pacific to the Penobscot, and from the Mexican Sea to the St. Lawrence, there are to-day thousands and tens of thousands of people, with their eyes anxiously fixed upon this court room to ascertain whether this decision shall ruin them, or whether they shall hereafter stand as they have heretofore stood, — under the protection of the law.

On the other side, this claim that is made is a mere speculation. t is a speculative claim, got up for the purpose of assailing this cumulated and vested property, and, if possible, sharing it or grasping it. That such is its purpose appears in our bill of complaint, and in the advertisement under which it was launched. I read an extract or two from that bill and that advertisement (complts, i, 13): —

"An application for a patent was filed to-day, that, in consequence of its *vastness of interest* as well as *wealth of prospect, renders it a subject of national interest.*"

That is strictly true, may it please your Honor; it is a subject of "national interest."

The application for the patent made in 1880, in the month of July, four years and some months after the Bell patent was granted, is a *pending application*, and it has been backed up by numbers of other applications from the same source, which the record discloses, and which are also pending applications. My learned friend yesterday told your Honor that this was only a *little* question whether his venerable friend Drawbaugh, and his innocent coadjutors, were to be allowed to practise his own invention in peace or not. It had shrunk, in his eyes, from being a question of great "*national interest*" into a petty question whether his innocent clients should be entitled to use the invention which Mr. Drawbaugh had made.

"The *cash* capital of the company" [which filed this application] "is five millions of dollars, with headquarters in New York, and in about sixty days they will open up the telephone, which will certainly result in the *driving out of all telephones in the market*, save the ones they hold, or else compelling the Gray, Bell and Edison lines *to pay the new company a munificent royalty.*"

The wealth of Eldorado is there. The owners, under Bell, must be crushed out or pay a *munificent* royalty. Such must be the result if the expected patents upon Drawbaugh's invention can be granted to them; and here and now is the first issue made, whether they can or not. The advertisement goes on: —

"A *large number of capitalists* were here to-day to see the filing of the application, and they assert, with a positiveness that is almost convincing, that it will not be long *till they have entire charge of the telephones* not only in this country but in the world, and that they will be able to establish lines by which messages can be transmitted for *almost a song.*"

The song of the siren! That, may it please your Honor, was the programme on which this body of "*capitalists*," with five millions of dollars in "*cash*," proposed to raid this property. That body of *capitalists* has been in this court ever since. It is here now. I see it.

One difficulty stood in their way, and that difficulty was this court. Immediately after this advertisement became public, which was the first time that it had been heard in the world, — I don't say the first time that it had been heard in the little circle of a half dozen people who assembled around Drawbaugh in Harrisburg, but the first time that it had been heard in the world that Daniel Drawbaugh was the inventor of the Bell telephone, — this Bell Telephone Company, standing, as it does, the grantor to and the trustee for all these numerous companies spread over the United States, set itself to investigate this claim and ascertain what foundations it had. Fortunately for that company, it had for its counsel my friend Mr. Storrow, upon whom I pronounce no encomium. His monument stands before you; and it will remain an imperishable record to his honor and his glory. He went to that country at once, and what did he find? These "*capitalists*," so called, had been spreading themselves all over that community, had inveigled into their net all these farm laborers, loafers, and people in similar condition of life, who surrounded Drawbaugh, and were his friends and intimates, and had got from them all, or at least from as many as they could, affidavits committing themselves to this claim which was about to be made. It was a terrible task to undertake to unravel the meshes of that complicated web. Talk about detectives, whose names have become famous in the annals of modern civilization by the skill with which they have seized upon clews and unravelled the nets of iniquity! Why, the records of this case are more interesting than Gaboriau ever wrote. Mr. Storrow, who stood there on the outside of that well-knitted, *fraudulent combination*, and looked into it, found himself barred upon every hand by the outposts, the sentinels, the guards that had been cast about it by these ingenious "capitalists," with their five millions of capital *in expectancy*, and he had to go to work in the most circumspect manner. He knew not to whom he might speak; he knew that whatever he did or said would be carried at once into the enemy's camp, and that he would be dogged and followed. It was an Herculean task that he had to undertake. He has done it well, and I trust he has done it successfully; he has earned the undying hatred of the "capitalists." At once he found out certain things, — certain facts, — facts which stand to-day as facts, and which have not been attempted to be shaken or affected; facts that rest not in the uncertain memory of man, that depend not upon the influences that can be cast about witnesses, either to affect their integrity or their memory; but monumental facts on record, — printed and written and sworn to. He brought these facts together and put them into his bill in equity, and moved for an injunction against this body of "capitalists," who were about to take possession of one hundred millions of property, from the Atlantic to the Pacific, throughout the whole United States, and he moved for an injunction in this court.

What happened, may it please your Honor? The defendants were challenged to come up to this bar and tell their story. This body of "capitalists", about to seize this property (sixty days was all the time they wanted to take it in, if I read their advertisement aright) were called to come up to this bar and show cause why they should be permitted to do it. And what did they do? They had a trunkful of affidavits, which they had been collecting for some months; they had this immaculate person, Drawbaugh, alongside of them here with his affidavit, — which, I will mention in passing, we have been trying very hard to get possession of ever since and with eminent failure. We have called for it on the record, and it has been refused to us. We wanted to know what the story was when it was thus first concocted; we wanted to know how far Daniel Drawbaugh had put himself on paper when he came to this bar in 1880; we have called for that affidavit on the record, and his distinguished partner said, "It is in Washington. I don't know that it is any of your business to have it. You can't have it; it is all right" (defts, ii, 1060–1). We have not been able to get that affidavit. But they stood before this court and said — what? They swore that they were not going to make telephones, they didn't mean to make telephones: there it is, in their affidavits filed, — they didn't mean to make telephones. (See moving papers, affidavit of defendants' witness, Lewis Abraham.) Why should the Court lay its hands upon them? They were now engaged in taking the opinion of counsel whether they had a case. That is what they swore to.

Mr. Hill. — Just read that affidavit.

Mr. Dickerson. — I will read what I please.

Mr. Hill. — I prefer to have it read.

Mr. Dickerson. — Well, you will hear enough read to-day to last you your natural life.

Now, may it please your Honor, I stand before you making statements which *may* not be true, but which I know your Honor will believe to be true until you look at them and find them to be false. They never said that they had a defence to make that day, but they begged the Court not to enjoin them, because they did not mean to make telephones, and they said they were taking the opinion of counsel, which they had been some time taking, as to their defence. Your Honor was not in this court when Judge Blatchford was sitting on that bench; but anybody who knows Judge Blatchford will remember him. When he draws down those spectacles of his and looks across the top of them at a man, as he did that day, that man might as well be struck with lightning. "Well," said he, "if you are not going to make telephones, it won't do you any harm to be enjoined; and I think I will enjoin you." And they went out of this presence with their sixty days' scheme nipped in the bud. That was four years ago; and during that time this company of "capitalists" has been engaged in finding out, what they didn't know in 1880, whether they have a defence. They don't know it now; but they didn't know it then, *and swore so*, — that they were taking the opinion of counsel as to their defence.

Well, sir, let us see how this company of capitalists came into business. Daniel Drawbaugh was a genius, of local renown; he lived at Eberly's Mills. I wish to fix your Honor's attention now, for a little, upon the topography and geography of that place. There is a map of it here, which I will not ask you to look at now; but I tell you that Dan Drawbaugh's shop is as near to the city of Harrisburg as this court room is to my house in Thirty-fourth Street; it is "within sound of Bow bells"; it is within three miles of the city of Harrisburg. It is a suburban village, which has in it *twenty houses and seventy-five people*, — its population all told, — "within sound of Bow bells," within three miles of the city of Harrisburg, which was their base of supplies. In the course of his varied career, Drawbaugh, this eminent "*old gentleman*," as my friend, Mr. Edmunds, called him, — and I protest against the "venerable" in that expression, because I feel it to be a certain sort of personal reflection upon myself, for he is some years younger than I am, and he was forty years old when he achieved these great results, — this eminent "old gentleman" had been occupied there for some years in astonishing the natives around him by various feats of legerdemain and trickery, which I will come to presently. There was in the town of Harrisburg a "gentleman" by the name of Chellis, who keeps a ninety-nine-cent store there, and whose advertisements, among other things, are in this record, — for which he probably has never paid Mr. Storrow anything, although it has given him a degree of publicity which he had not heretofore achieved, — where you can buy a set of gold jewelry for ninety-nine cents, or anything that man, woman, or child wants, from the cradle to the grave, for that exact price. This Mr. Chellis, living a neighbor, within gunshot of Mr. Drawbaugh, and having a friend by the name of Dr. Moffitt, a dentist in Harrisburg, a rather eccentric character, who, like the Ravels, used suddenly to disappear from the scene of action, and not be seen for some months again —

Mr. Hill. — Oh, no!

Mr. Dickerson. — Yes, it is on the record. You know about it.

Mr. Hill. — I don't know anything about it.

Mr. Dickerson. — Don't pile up any more sins upon your soul. Before I get through I will show you enough. Now, your Honor, this Mr. Chellis and this Dr. Moffitt and Mr. Drawbaugh formed a partnership in 1880 for the purpose of going into a Patent Office fight, and getting a patent for a certain molasses spigot, which was an improvement made by Drawbaugh upon a certain other molasses spigot, which was an improvement upon a long line of ancestors in that way for a century. Two improvements on this valuable device had been made by Daniel Drawbaugh, the first one having resulted in an enormous pecuniary loss to his innocent friends; and in 1878 he had got another improvement, upon which he formed a partnership with this Mr. Ninety-nine-cent Chellis and this Dr. Moffitt to manufacture the spigots. Chronology here is very important, and I am going to try to keep it before your Honor's mind in the various presentations that I shall make to you.

At that time, in 1878, Bell's patent being then two and a half years old, — this was in the fall of 1878, — Drawbaugh had been at work, as hundreds of others had, at experiments on telephones. He began those experiments in the fall of 1876, — but I am not going to discuss that question now, I am merely stating that theory for the purpose of illustrating what I am now speaking of, — he began those experiments in the fall of 1876, and in 1877 and 1878 he was occupied in prosecuting those experiments with a view of making the telephone talk louder. The local newspapers about that time were reporting that Mr. Drawbaugh was engaged on inventing a "*new kind of telephone*," which would be an "*improvement upon the mother invention*" (complts, iv, exhibits, 388, 398). He was then engaged in trying to improve the "mother invention," and these two gentlemen, Mr. Chellis and Dr. Moffitt, came into partnership with him to apply for a patent and manufacture his improved molasses spigots. The testimony of Dr. Moffitt *now* is, that for many years — away back before 1870 — he had been very familiar with Drawbaugh; had been in his shop a great deal, attracted there by his inventions and the glory thereof, and that in the year 1873, five years before this partnership was formed, he had heard Drawbaugh's receiver, lettered "A," speak so loud to him, — Drawbaugh being at the time in the cellar, talking to a transmitter, — that he turned around, supposing Drawbaugh to be at his elbow, and was surprised that he was not. He has so testified as to that year, — and he is one of their strong witnesses to prove Drawbaugh's invention. This Dr. Moffitt was one of this molasses-spigot partnership. At that time when the partnership was formed, Drawbaugh, according to their present testimony, if it be true, had in that room — where these partners were, where their business was carried on — a row of telephones *culminating in the Blake transmitter lettered* H, *which had been finished two years and some months earlier than that*, and which, so far as we know, were never outside of the four walls of that building where these partners were. Drawbaugh, however, *was experimenting at that time upon telephones*. The ninety-nine-cent man was prosperous. He had turned his dross into gold, and was going in now for some speculation in patents, and Drawbaugh said to these people, in substance, "Come in with me now, and help me upon my telephone inventions." I am telling your Honor their story as they swear to it. Dr. Moffit was one of the partnership. He knew, of his own knowledge, if his testimony now be true, that Drawbaugh had a telephone which startled him from his propriety *five years before that, in that same room, in that same building* (defts, i, 517). He also knew at that time, — 1878–79, — as all the world knew, that the telephone was spreading itself over the land, bringing in its train fame and fortune to its inventor and its owners. "Come with me," said Drawbaugh, "and help me with my telephone." And what did they say? "Why, Drawbaugh, you can't anticipate Bell, and what is the use of your spending your time upon these things? You can't anticipate Bell." Well, there was one man in that trio who knew whether he could or not, and that man was Moffitt. There was another man who knew whether he could or not, and that man was Dan Drawbaugh. The ninety-nine-cent store man knew nothing about it. But those two men knew; and what happened? Drawbaugh's answer to them was, "I DON'T KNOW ABOUT THAT; I HAVE BEEN WORKING AT IT A GOOD WHILE." I am quoting *Drawbaugh's very language*, that Chellis himself puts on this record (brief, p. 232) in quotations: "I don't know about that; I have been working at it a good while." Well, if he didn't *know* whether he could anticipate Bell, there was a man alongside of him who *now says* he did; and that man was Dr. Moffitt; but, upon consultation, the conclusion was that they wouldn't trouble themselves with Dan's pretensions, but would go into a Patent Office fight, and get a patent, if possible, for his improved *molasses spigot*, whose business it is to measure out molasses from barrels in cold weather, when it don't run freely. And they formed a partnership, of which the *two foundation stones* still remain in the further developed partnership which has resulted in bringing this great case into this court. Those two foundation stones were Chellis and Dan Drawbaugh; and they went into a Patent Office fight about a molasses spigot.

A man named Hauck, who had been Dan Drawbaugh's associate in that very room where these supposed telephones existed, working with him for years at the same bench, claimed also to be the inventor of that molasses spigot. *It was an important question.* This great inventor, Drawbaugh, who at that time had become famous as the inventor of the "*justly celebrated electric clock*," — that great inventor, with his backers, went into a litigation in the Patent Office about a molasses spigot. If it had not been for that litigation we never should have had the pleasure of seeing the third partner in the business, Hill. He was employed by Chellis and Dan as counsel in the molasses-spigot business, and that brought him into this case. They carried on that molasses-spigot case through the winter of 1878 and 1879, and they carried it on at great cost, with eminent skill and success; for they beat David Hauck in the Patent Office, and got that molasses-spigot patent, and they have it yet. It cost a great deal of money and a great deal of time; and I trust for their sakes that it will prove more remunerative than the ancestry from which it descended. They got that patent for the molasses spigot, and by that time another year had rolled on, and the fall of 1879 came. All the while the telephone was spreading itself over the land, and a great litigation was going on between the Western Union Telegraph Company and Mr. Bell. Part of the testimony in that litigation is in the record before your Honor now, and your Honor has been told by the other side about that litigation in the argument here.

The Western Union Telegraph Company has a disagreeable habit of finding out whether a man is the true inventor of a thing that he claims, by just taking it and using it, and letting him prove his claim in court. They never know it so well as after that, because the chances may be that he is not the inventor. Like some men who never will pay their debts until a judgment is got against them and is satisfied on record; otherwise they cannot be sure that their debts have been paid. The Western Union Telegraph Company, wishing to know whether Bell was the inventor, had taken possession of the Bell telephone and had spread it over the country. That Phelps "crown telephone," that has been shown to your Honor, and that elliptical instrument called the "snuff-box" instrument, — those were the Western Union Company's instruments, — infringements of the Bell patent. This great litigation was going on in 1879 between the Western Union Company and the Bell Company, which was struggling at that time to maintain its foothold against its formidable assailant. It did look then as if there was a very good chance for *somebody* who could help the Western Union Company to a defence to get into that fight and make something. The Western Union Company were setting up Elisha Gray as the first inventor of the telephone. The microphone, in the form of the carbon transmitter, had emerged in a manner which I shall state to you presently, and was now a controlling element in the case; because, when the wire line of a telephone is laid across the country, where it comes near lines of telegraphs, the inductive action of the telegraph currents upon the telephone wire generates sounds in the telephone. Every one of us has heard them snapping and snarling in the telephone receiver, and the *feeble magneto current* is drowned out. It is, therefore, necessary to get a strong battery current of electricity flowing on the line, upon which a throttle valve, — so to speak, — to turn it off and on, may be applied, and may be regulated by the voice, and so get the benefit of a strong battery current, which is not so easily drowned out by interfering induction. Therefore the carbon transmitters had become very important; and numbers of inventors had been at work at them in the manner that I will mention presently. Berliner was one, Edison was one, and a number of others claiming to be inventors and improvers of that thing. The Western Union Company bought up, as they had a right to do, the inchoate rights of as many inventors of these useful collateral things, microphones and the like, as possible, as a shield against the Bell attack; for, if Bell should prevail with his broad patent which *covered* the magneto as well as the microphone, yet, if they had a patent upon the special microphone devices, especially for the use of the "*hard carbon*," which is a great thing, — if they had a patent upon *that*, of course they could prevent the Bell people from using it, and they would have a very good weapon in their hands to fight with. That fight was going on during the years 1878 and 1879. And it was going on in 1879 when Chellis, in Harrisburg, concluded that he would like to have another show at the question whether something could not be done with Drawbaugh's telephone improvements he was then working on. Thereupon he sent to Washington for Hill, who had been his counsel in the molasses-spigot case.

Hill came to Harrisburg for consultation in 1879 over the question whether Drawbaugh had *anything* that was *worth patenting*, and they had a consultation, when Mr. Hill advised Chellis — this is the story as Chellis tells it — that no doubt Drawbaugh was the first inventor of everything that had ever been done, but it was not worth his while to go into it, because here was the Bell Company, and Chellis would have to spend one hundred thousand dollars to beat the Bell Company before he could establish Drawbaugh's title. May it please you Honor, that day and hour that Exhibit **H**, — the Blake transmitter, — if it had existed in 1876, was worth a million dollars cash, as soon as a check could be drawn for it, — and no man knew it better than Lysander Hill. **H**, *the Blake transmitter, then three years old*, in that very room, was worth a million dollars cash as soon as pen could be put to paper, — if the story were true. Why? Here was a great fight against the Western Union Company, which was defending itself against the Bell Company, and the Blake transmitter controlled the profitable use of the Bell patent.

There were also at that consultation on the same table **D** and **E**, those magneto telephones *made, as they say, in 1875*, never taken out of that shop. And this great question was raging, and Hill, as a patent agent, had come right from Washington, where the fight was raging in the Patent Office, — it was raging also in the public press, — who was the inventor of the microphone or the carbon transmitter? Berliner was claiming it, Edison was claiming it, Hughes was claiming it in England. It was a controversy on which depended not only fortune but fame. That fight was going on then and there when Mr. Hill sat down with Chellis and Drawbaugh, and — *according to their testimony now* — Drawbaugh must have said to them: "Here is the Blake transmitter, now in general use, but which "has come into use within a few months. Here is the Blake transmitter. Don't you see it, gentlemen? Why, it is not only the "Blake transmitter as it is in use in Harrisburg, but the castings, the "screws, the springs, the details, are exactly like those that you can "see right here in Harrisburg, if you look at them, — you can almost "take one set of patterns and make the other instrument, — and *I "made that, with my prophetic soul, two and a half years before it "came out in the world*. Don't you think that is worth a thirty-five-"dollar patent fee?" Hill says, "No, I think not; thirty-five dollars "is a great deal of money." "But," says Drawbaugh, "here are "**D** and **E**, the magnetos: don't you see that they are exactly "like these butter-stamp things" (those black instruments that we have in our hands now)? "Don't you see that they are exactly like these "in every respect? Here! I show you Bell's patent, taken for them "in 1877." Mr. Hill saw fit to tell your Honor — and he is a good witness — that Drawbaugh had the 1877 patent, and probably the 1876 patent; but he had the 1877 patent. "Don't you see, here are **D** and **E**, exactly like Bell's 1877 patent, and I made them in 1875, as my nephew, Harmon, knows?" "Oh! I see that," says Hill, "it is very plain; but, Mr. Chellis, I advise you not to risk thirty-five dollars in applying for a patent for that. It is a great deal of money, and you had better not." "Don't you see this string of instruments," says Drawbaugh, "that I have had for ten years, talking to the whole country-side here? I will call our partner Moffitt. He heard that **A** talk so loud that it astonished him and took him off his feet five years ago. Don't you see that?" "Oh! you better not," says Hill, "risk any money on that. Thirty-five dollars is a great deal of money." And Mr. Hill went back to his Patent Office in Washington, and this partnership of *two* remained up there and decided to do nothing. That was in the late summer or fall of 1879. (See the references in brief, pp. 228–235.)

The Western Union Company was defeated after the world had been scoured for information, with all the resources of that mighty corporation, and all the ability that they were able to command. My lamented friend, George Gifford, was their chief counsel, and Mr. Causten Browne, of Boston, another. They surrendered. They had exhausted their defences against the Bell patent, WHILE HERE WAS DRAWBAUGH, HANGING AROUND THEIR TELEPHONE OFFICE IN HARRISBURG AND BORROWING THEIR INSTRUMENTS, WHO COULD HAVE PUT BELL OUT OF COURT IN A MINUTE, BUT WOULD NOT OPEN HIS MOUTH. But they had something left; they owned the Page patent for the Ruhmkorff coil, recently sustained by Judge Blatchford, and which is of great value in the Blake transmitter; it is not *actually necessary*, but it is *practically* necessary in telephones; and they owned it. Edison claimed to be the first inventor of the *hard-carbon* transmitter, and they owned his claim, and that was essential to the developed telephone. They had that to trade on. There was a dispute whether he or another who had sold to Bell was the first man, and it was a fair question, and might be decided for Edison. These were the things the Western Union had to compromise with when they surrendered.

Then an infringement was commenced by a party in New York, and they were looking about for defences. One of the party, however, lived in Washington, where Mr. Hill lived. They were looking about for a defence. Now this was in 1880, four years after the Bell patent, and half a generation after the invention by the *venerable* Drawbaugh, who evokes the admiration of my friend from Vermont. They were looking about for a defence; and they got knowledge, somehow, that there was a man up in Harrisburg who would sell them a defence if they would buy it. In this situation a partnership of *four* was formed. That partnership was what I would call the *quartette* in this case,— Hill, Jacobs, a little attorney up in Harrisburg, the ninety-nine-cent Chellis, and Drawbaugh. They formed a partnership of four. That is the quartette, may it please your Honor, that has been making music for this country for the last four years. They formed that partnership. Then these New York infringers were sent up to consider whether they would not buy Drawbaugh's defence, — not as a means of making any telephones, but as a defence. Somebody advised them (I don't know who it was, — I was not with Mr. Hill every day during that time), — but somebody advised them it would be a good thing to do, and they sent a layman up to Harrisburg to investigate Drawbaugh's case. He saw Drawbaugh, saw his affidavits, and saw M. Jacobs. Mr. Hill was not there, but the other three partners were; and it resulted in this, that the New York company of infringers — having been advised, as they say, by counsel, that they were infringers — agreed to pay $20,000 in cash for Drawbaugh's defence; which $20,000 in cash was divided immediately afterwards into four equal parts among the four partners,— Hill, Jacobs, Drawbaugh and the ninety-nine-cent man. Now that was a magnificent "*strike.*" So far that parnership was eminently successful. To raise $20,000 in cash out of Chatham Street, you know, is a thing not to be done every day. But they did it. They got their $20,000 in cash, and more. They got and divided among themselves in equal parts an amount of that five millions of capital stock, "cash"—"cash" capital stock that we have heard of — they got and divided among themselves an amount so great that when we called upon them on the stand to tell us how much it was, they refused. We were entitled to know, may it please your Honor, because Dan Drawbaugh was their witness, and his interest in the result of the controversy we were entitled to know, and we said, "Mr. Drawbaugh, how much did you and your partner divide of that capital stock?" "Under the advice of my counsel, I decline to tell." We could have come here and got an order on him to tell, but it would have wasted time, and we consented to accept an admission upon the record that the divide was "*considerable.*" What "considerable" means, we do not know. But, no doubt it was an immense portion of this five millions "*cash*" capital that was divided among this partnership. That was a good operation. The partners began on velvet; they had $20,000 in their pockets, in equal parts, and "*considerable*" of these five millions to go into market and sell to an unsuspecting and innocent community. They began business upon that basis. That is the partnership. (See complts' brief, p. 234.) One of its members is here, and has tried the case for himself and his associates. He and the rest of them have been ever since 1880 engaged in the business of making up their case. That is this case. It stands, to begin with, in the discredit that belongs to all speculative cases, got up for the purpose of attacking vested rights and raiding upon accumulated property. It comes here contaminated with that iniquity; and, if their story be true, contaminated with an original fraud, — for they cheated Dan Drawbaugh out of the greater part of the $20,000, because they put nothing in and they took $15,000 out: he put in the *entire capital — his story*.

That is this fight. These are the two sides to this controversy; and between them your Honor has got to decide. And even this speculative case, may it please your Honor, had been passed upon by the partners twice before, — before they brought it here, when they were five years, and six years, nearer to the facts than they are now, and when they decided for themselves *that it was not worth thirty-five dollars*. For your Honor now knows, and of course you know it, because it has been sworn to by a witness who has not been impeached, — your Honor now knows that Drawbaugh's distress for all those years was to get money enough to apply for a patent. That was all his trouble; he had no other difficulty. An application for a patent, as your Honor knows, costs $15, — I am going to be very exact in money now, because this is getting to be a money question, — an application costs $15, for which the Patent Office will examine the case and pronounce its judgment whether the applicant is or is not entitled to a patent. It costs just $15 to do that. If the Office decides in his favor, and if he wants his patent out, it will cost him $20 more. It costs him $35 in all when he has got it. It costs $15 to feel the pulse, to know whether the claims are going to be granted or not. The common charge of a patent agent is $20. Mr. Weaver, a highly respectable patent agent, and a great friend of Drawbaugh, who had been employed by Drawbaugh in other cases, or by Drawbaugh's associates, charged $20; and Drawbaugh, himself a patent agent, regularly charged $20 as his price. It was the going price; no more, no less. Drawbaugh adopted that price in his patent business; and so with every other patent agent. Fifty-five dollars was what it would have cost in those years, supposing Drawbaugh to be a man of extreme modesty, not wishing to appear in his own case. Now, sir, the partners decided in 1878, and again in 1879, that Drawbaugh's case was not worth $55; but when they got somebody they could strike for $20,000, then it was worth $20,000, and, in addition, it was worth a big proportion of $5,000,000 of stock, on which they started business. They have done immense mischief; but I don't think they are any nearer to their Eldorado than when they launched their bark upon the ocean. I don't think they are. But they have been sailing in that direction ever since; and they have struck an Eldorado on the *stock market with their chromos.*

It is a remarkable fact, may it please your Honor, — a remarkable coincidence, — that the headquarters of this concern — not for making a telephone, your Honor: they are under an injunction, Judge Blatchford put his foot on that business, — not for making telephones, or for selling them, but for the making and selling capital stock chromos, at a price reduced to the humblest capacity, — fifty dollars a share, so that every woman and child can buy one, — the factory for that is in what is called the "United Bank Building," the place where Ward victimized an historic man with an historic name, and where he drew in his victims, with his "inventions."

Mr. Hill. — The office of the senior counsel of the Bell Telephone Company is in that building.

Mr. Dickerson. — Undoubtedly. It needed somebody to watch such a crowd as that. It was obviously necessary to watch that gang.

Now, may it please your Honor, this speculation being launched, the injunction being granted, and the chromo mill being started, they had to come into this court, because they could not run on without being brought here; and they filed an answer. I will now show your Honor what that answer is. Let us have the chart by which we are going to sail. The answer is the chart. This court is a court of equity, which is to try the issues of law and fact *presented in the pleadings,* and not any other.

The answer, may it please your Honor (defts, i, 7), begins by saying that Daniel Drawbaugh —

> Constructed and operated practical working electric speaking telephones at said Eberly's Mills, and exhibited their successful operation to a great number of other persons resident in his vicinity and elsewhere. That the said electric speaking telephones so constructed and *successfully and practically used by him, as aforesaid,* contained all the material and substantial parts," and so on: "and also contained other important and valuable inventions in electric and magneto telephony, and were fully capable of transmitting, and were actually used for transmitting articulate vocal sounds and speech between distant points by means of electric currents; *that some of the original machines and instruments, invented, made, used and exhibited to many others* long prior to the said alleged inventions of said Bell, or either of them, *are still in existence, and capable of successful practical use,* and are identified by a large number of persons who personally tested and used and knew of their practical operation and use."
>
> When?
>
> "In the years 1870, 1871, 1872, 1873, 1874," specifying those years.
>
> "And both subsequently and prior thereto."

That is, that *those* machines "are still in existence and capable of successful practical use"; and that they were used in 1870 to 1874, and subsequent and prior thereto.

The answer then says,

> "that for more than ten years prior to the year 1880" [Drawbaugh] "*was miserably poor*, in debt, with a large and helpless family dependent upon his daily labor for support, and was, *from such cause alone, utterly unable to patent his said invention or caveat it or manufacture and introduce it upon the market.*"

There is a picture of poverty and misery, may it please your Honor, that when I first read it drew tears of sympathy from my eyes. A man with the great invention of centuries in his hand, fully perfected and in practical use for years, was so miserably poor that he could not get fifteen dollars! That was destitution; and if a judge won't decide a case on that, he won't on anything.

In further defence they say,

> "that the said Daniel Drawbaugh, after making, testing, using and extensively exhibiting his invention to others, and allowing them experimentally to personally test and ascertain its successful practical operation and utility, as aforesaid, and after the full and repeated demonstration of its successful working, as aforesaid, concluded that its range and capacity of usefulness to the public might be very greatly enlarged,"

and thereupon he invented all the microphones in the world and the Blake transmitter.

They then say,

> "that, notwithstanding his embarrassed and impoverished pecuniary condition, *and his utter want of proper mechanical tools, materials and appliances to conduct such work*, he labored with all reasonable diligence to perfect and adapt his said improvements, and did, finally, in due exercise of such reasonable diligence, perfect and adapt the same," and so on.

On the next page they tell us that in 1880 he applied for a patent; he had then raised the $15. How it must have cut the heart of the ninety-nine-cent man to give it to him! but he did. But that was after they had got the $5,000,000 of "cash" capital, and the $20,000 in money.

At the bottom of that page 9, they say,

> "that said Drawbaugh's original invention was complete, successful, operative and practically and successfully operated, and reduced to practice as a 'speaking telephone' on many occasions, in the presence and hearing of many other persons, and knowledge thereof was *freely communicated to the public by said Drawbaugh; and that*

said Drawbaugh's improvements, additional to his said original invention, were complete, successful and practical inventions; that all of his said inventions were fully reduced to practice."

On the tenth page, they say, notwithstanding the allegations on the ninth page, that this invention was reduced to practice and "*freely communicated to the public*," yet that no telephone has ever been put in public use on information derived from him. I will read it: —

> "This defendant, further answering, says that, so far and to such an extent as electric telephones were put on sale and into public use in this country by others than said Drawbaugh, prior to said Drawbaugh's application for a patent thereon" — that was 1880 — "*such specific machines and instruments so put on sale and into public use were not the specific machines and instruments invented by said Drawbongh, as aforesaid, but were machines and instruments invented by others* subsequently to the original and first invention of the electric speaking telephone by said Drawbaugh, and subsequent to the invention of his said improvements thereon, as aforesaid."

Notwithstanding that it was "freely communicated to the public" and given to the world, yet up to 1880 no telephone had ever been made based upon his invention; but the hundred thousand telephones that were in use at that time, and in that year, were made in consequence of the inventions of other people, who had no knowledge or information about Daniel Drawbaugh, and who went on with malice prepense, to go and do it right over again, when they ought to have known he was the man, — ought to have dug him up and found him out, and got their information from him.

Now was ever such a picture as that exhibited in a court of justice? That is their answer. How true or how false it may be must determine the result of this investigation. If that answer is false in any particular that is material to this issue, the defendants are out of this court.

It is false, may it please your Honor, *in every particular*, except in that one which says that the world got the telephone from somebody besides Daniel Drawbaugh. That is true; but, with that exception, there is no statement in that which I have read *that is true, or bears the most distant resemblance to truth.*

But that answer, may it please your Honor, was not sworn to by

Daniel Drawbaugh; it was sworn to by somebody or other, I don't know who, — some of this New York crowd,—and therefore Daniel Drawbaugh might say, "I am not responsible for the lies of my partners." We proposed to shut that door up and not let him say that; and thereupon we put to him, in his cross-examination, this question (defts, ii, 926): —

> "*X Q.* 775. Will you look at a printed copy of the answer which I now hand you, and especially at the tenth, eleventh, twelfth, thirteenth, fourteenth, fifteenth and sixteenth sections, and, after reading these sections carefully, tell me whether the statements therein contained, so far as they relate to yourself and your history, are in accordance with the information which you had given the defendants, or their counsel, and were justified by what you had told them?
>
> "*A.* Yes, sir, to the best of my recollection, *that is in accordance with the statements or history of the invention which I had made.*"

He had made that answer for them, and they had sworn to it. He is the man,— the indorser I have no account with. The maker of that note I call to this bar. He was asked: —

> "*X Q.* 776. I call your attention to a statement in the eleventh section, in these words: that said Drawbaugh, for more than ten years prior to the year 1880, *was miserably poor, in debt, with a large and helpless family dependent upon his daily labor for support, and was, from such cause alone, utterly unable to patent his said invention, or caveat it,* or manufacture and introduce it upon the market. You understand this to be a statement, do you not, that before 1870 the cause and the only cause why you did not patent or caveat your invention was your extreme poverty?
>
> "*[Objected to by Mr. Hill as putting an incorrect construction upon the said statement quoted from the answer.]*"

That is good!

Now let us hear Drawbaugh: —

> "*A.* *I can't say it was extreme poverty*, but I felt myself unable, because I made applications to other parties to take an interest. At that early day I knew that it was necessary to experiment for the purpose of making the machine as perfect as possible, and I know that I had no ready cash or money to secure patents; for that reason I asked others to take an interest in it."

That is what Drawbaugh says. He can't go the "extreme poverty" they swear to: that was too much for his stomach; he put it in the answer, not expecting to be called up to the bar to verify it. He says, "I can't say that." I should think not, may it please your Honor, I should think not. His accounts are before the Court. He had an enormous capacity for getting all the money he wanted for all his vagaries and fooleries; and he worked that capacity to the utmost on that neighborhood, and got large amounts of their money. He had an astonishing capacity. There is no other character that I know of that so nearly resembles this man as Harold Skimpole. He is a vulgar Harold Skimpole.

Mr. Hill. — Who is that?

Mr. Dickerson. — Well, you never read enough books to know if I should tell you.

Well, sir, to come to the next part of the answer. He swears, sir, that he hadn't tools enough, nor mechanical appliances enough, to make a telephone, and therefore he could not get on as he should. He swore to that specifically, and we brought him to book on that.

Your Honor now knows that Daniel Drawbaugh's neighbors put about thirty thousand dollars into his inventions along in that time, — about twenty thousand dollars of it in tools for his shop. That shop was stocked with tools in 1867, and it kept on having more put in right along all the way up to the time of this controversy, or until long after the important facts of this controversy had existed.

We will first examine Mr. Hill as a witness. Will your Honor do me the favor to turn to the three hundredth page of the defendants' brief, the first paragraph at the top of the page. It is one of the issues here. We denied this averment of the answer. The defendants say of our denial, in their brief, p. 300: —

> "Let us see if the complainants do not *misrepresent* the fact here also."

Your Honor now sees how we have been charged with grossly misrepresenting the facts. I will read Mr. Hill's brief on this subject: —

> "Up to July 1, 1873, Drawbaugh had the use of the old Faucet Company's tools and machinery. These were special tools, adapted to making faucets, and not to electrical machinery at all. From 1873 to May, 1876, these tools belonged to the Haucks, and Drawbaugh *had no right to use them*. In May, 1876, they were removed from the shop. From March, 1875, to some time in the fall of 1876,

the Axle Company's tools were at the shop, but they, too, were special tools, adapted to making axles, and not to electrical devices, *and Drawbaugh had no right to use them.*"

That is the statement we point to, your Honor, of a man who knows this record much better than I do, sir, for he examined the witnesses himself, — mark it!

Now I call Daniel Drawbaugh (defts, ii, 997–8). Mr. Hill, on his honor, assures the Court that Drawbaugh was not entitled to use any of the tools of those two companies. He knows, of course, and we know, what estimate he has formed of men who misrepresent facts, and he wouldn't, of course, do so! Drawbaugh was asked (defts, ii, 997): —

> "*X Q.* 1113. While the Haucks occupied the shop, *did you have the use of the shop and tools in the same manner as you had while the Faucet Company was there?*
>
> "*A. Yes, sir; they gave me that privilege.* I had a small room in the upper part of the shop, that I occupied during the time they were there; the machinery, generally, was on the lower floor, and I did not use it unless they were not there, or were not using it. *There was a pretty large portion of the time they occupied the shop that they were not running; there was months, sometimes, that they wouldn't come to the shop.*"

Of course, your Honor is expected to believe Dan's partner, and not Dan himself, although his story is not sworn to, but only put in print for the benefit of your Honor.

Now we will turn to p. 998. Dan was asked: —

> "*X Q.* 1116. Did you have the privilege of using the machinery of the Axle Company while it occupied the shop?
>
> "*A. Yes, sir;* at times when they were not using, I used their machinery, often at night."

YES, SIR.

I wouldn't for the world ask your Honor to doubt Mr. Hill's testimony, but that does look suspicious.

MR. HILL. — "At times when they were not using it." You didn't read the whole.

MR. DICKERSON. — Drawbaugh has been certified to be a man of veracity; and I think that, since he swore to it, it may be taken as some evidence that the statement in this brief is false.

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Mr. Hill. — He said he used it at times when they were not using it.

Mr. Dickerson. — Now, sir, these are some of the issues raised in that answer which your Honor is called upon to try as questions of fact, and you are called upon to try them as questions of fact under the rules of law. What are those rules? They are these: When a patent has been granted; when an inventor has complied with the requirements of law, and given to the world his invention, and somebody else comes in and says he is the first inventor, he must prove it beyond any reasonable doubt; *and to raise a doubt is to resolve it against the claimant.*

Those are the principles of law, well settled. He must prove it beyond a reasonable doubt, and to raise a doubt is to resolve it against the defendant. Those rules, may it please your Honor, have been made necessary, and have become embodied in the law of patents; because the moment an invention is made, the moment it is brought into public use and published, it excites the cupidity of knaves all over the world, and, as Judge Grier said in Goodyear's case, in which I had the honor to assist in the argument, "envy robs him of the honor and speculators and pirates rob him of the profits." And so the law surrounds a patent with a protection so high that no attack can surmount it except that which comes with clean hands and a pure heart and is free from doubt. If it be contaminated with fraud or with doubts, it is dead.

We have had a commentary here upon the case of *Coffin* v. *Ogden*, 18 Wall. 120, and, as some little things in that case may have escaped the attention of your Honor, I will recall your mind to it.

That was a case, may it please your Honor, in which an inventor, before the date of the patented invention, invented a lock, — a trifling affair to be sure, but a thing exactly similar to the patented lock. *It was admitted by the patentee that the claimant did so invent it at the time he said he did*, which was before the time when the patentee invented his invention. It was admitted that he invented it before the invention of the patentee.

Mr. Hill. — What case was that?

Mr. Dickerson. — Coffin *v.* Ogden, 18 Wall. 120.

Mr. Hill. — Where do you find any such statement as that in the record?

Mr. Dickerson. — It would do you a great deal of good to keep silent, because every time you ask a question you are more exposed. I have no objections to your asking these questions, but I tell you, for your sake, that you had better not.

Where do I read it? From 18 Wall. 121. The Court says: —

> "Kirkham [the patentee] made his invention in March, 1861. This is clearly shown by the testimony, and *there is no controversy between the parties on the subject.*
>
> "It is equally clear that Erbe made his invention not later than Jan. 1, 1861. *This was not controverted by the counsel for the appellant,*" — it was admitted at the time that he made that invention, it was not controverted, — "but it was insisted that the facts touching that invention were not such as to make it available to the appellees as against the later invention of Kirkham, and the patent founded upon it."

This was simply a demurrer to evidence, — to admitted facts.

The patentee admitted that the earlier man made his invention, but contended that when he made it he did not so deal with it as that he could deprive a subsequent patentee of the benefit of his patent. Why not? Why, because the first inventor did not put it into such public use as to give the public the benefit of it, and, therefore, ought not to deprive of his patent a subsequent man who did. That was the question of fact, and of law.

Then the Supreme Court said: "Here it is abundantly proved that the lock originally made by Erbe was complete and capable of working." That is the *first* point. The priority of Erbe's invention was clearly shown. The *second* point is, "it was known at the time to *at least five persons*, including Jones, and probably to *many others* in the shop where Erbe worked." The *third* point is, "and *the lock was put in use*, being applied to a door, as proved by Brossi." And the *fourth* point is, "it was *thus tested, and shown to be successful.*" Therefore the patent was defeated.

Now that is not any new law: it has been law forever. The only question there was, how much public use must a man make of a prior invention in order to defeat a subsequent patent? He must put it into successful use, says the Court. If he has done that, — if he has put it into use and proved that it is successful, and has done that *in the presence of a number of witnesses*, — that is the end of the case. But all that was admitted in that case is denied here.

That case, however, may it please your Honor, warns us of another danger. In that case the patentees attempted to suppress the testimony of witnesses who proved the former invention. They threatened to turn them out of employment if they testified; and the Supreme Court commented on it with that severity which such conduct deserves, and on that account gave still further confidence to the testimony.

It warns us, may it please your Honor, not to be found in any such condition as that. It warns us to be careful that we are not suppressing the truth from the Court; not deceiving the Court for the purpose of carrying out any nefarious plans. That is a good warning.

The other side, may it please your Honor, have attempted to put us in that position, knowing how the condemnation of equity rests upon such conduct.

And now, before I go further into the case, I propose to clear up our record; and when I have done that, may it please your Honor, I shall expect to stand before this Court as the advocate of a cause that is as pure as snow; that is not contaminated by anything but by the breath of calumny and the vituperation of slander, poured out in this presence.

One other case for a moment,— the Atlantic case,— Atlantic Works *v.* Brady, 107 U. S. 203. The testimony was all one way. I mean by that, *the testimony of witnesses*. A number of witnesses proved — so far as witnesses can prove anything — that the invention there was anticipated by the machine made by a certain man. Then that man's acts — his conduct — were proved before the Court, and were not disputed; but they were such as no man would have done if he were the inventor. The Supreme Court said, in respect to the testimony, "*It may all be true, — but we cannot give it effect " against* WHAT HE HIMSELF DID, AND DID NOT DO, *without disregarding the ordinary laws that govern human conduct.*"

That was the rule of law laid down by the Supreme Court; and may it please your Honor, a similar rule governs us all in our daily life. When a fellow comes to you, and brings a certificate from his clergyman to show that he is composed of the cardinal virtues and of the Ten Commandments, and produces witnesses to prove that his reputation is good, while he puts his hands in your pocket and steals your pocket-book, you will look at his acts and not at his witnesses. Human conduct speaks louder than human testimony given by the breath of erring and mistaken man. Conduct is the logical consequence of antecedent causes, just as the movement of the heavenly bodies is the consequence of the law of gravity; and when you know the law, you know what the conduct must be, and *conversely*.

But your Honor also knows that from the days of Ananias and Sapphira till now, man is desperately wicked, and given to sins of all kinds; and that lying is his normal condition. Education and civilization bring a man above it. The natural tendency of the human animal is to lie. A child — almost any child that was ever born — will lie. When the conscience is educated, when the sense of moral responsibility is elevated, when the laws of ethics and morals are comprehended, when example impresses itself upon the growing character, then vice is eradicated. Why, the world fell because its first ancestors lied! It was the normal sin in the animal from the beginning.

Now, may it please your Honor, I am going to clear our record, for I don't want it to stand here charged for one moment, or left for one moment under the charges your Honor heard yesterday, — charges that were sufficient, if true, to load with infamy their object.

If it be true, what Mr. Drawbaugh's partner told your Honor yesterday that we had done, it would be your duty, and I have no doubt your pleasure, to close the doors of this court room to us. We ought to go out of it, sir, branded and disgraced. If those charges, on the other hand, are calumnies, it needs no imagination to transfer to the other side the consequences.

Now, I begin, sir. We are charged on this brief of these defendants with "deceiving," "imposing upon," "misleading" the Court by false statements of the facts and the evidence.

In this case, may it please your Honor, Bayler was a witness who had sworn that Daniel Drawbaugh was in great poverty, and that his poverty was of such a character that Drawbaugh always got from him everything that he owed Drawbaugh as fast as he could get it, but that Drawbaugh would always be in his debt for that which Drawbaugh owed him. We made that statement in our speech, and in our brief, and exposed its falsehood. Mr. Hill told your Honor that our reply to it was a gross misrepresentation of the facts; and he read out of the argument of Mr. Storrow to show that he had misrepresented the facts by saying that Drawbaugh always got his payments *in cash* from Bayler, and that he never, himself, paid anything, but was always delinquent. And he said that our denial was false, and that the contrary was entirely the truth; and he undertook to read the evidence for that purpose.

Now, sir, they called Mr. Bayler, and asked him this question (defts, i, 160): —

> "*Q.* 20. Do you know what Mr. Drawbaugh's financial circumstances were during the time that you were engaged in the lumber business at New Cumberland?
>
> "*A.* Only from hearsay, and my own knowledge is, hard to get money from; didn't ever seem to have any, *for his repairs that he made for us he would collect very close, and would want the money for the repairs, if he owed us or not.*"

That was their statement, — "for his repairs that he made for us, he would collect very close, and would want *the money* for the repairs, if he owed us or not." Isn't that *cash?*

Thereupon Mr. Hill read Bayler's twenty-fourth answer as qualifying that, and to show that Bayler did not say *cash:* —

> "Frequently he got lumber from us; account was settled through repairs, excepting the last bill, about the end of my business transactions there, for which I hold a lien against him, or somebody else, I don't know which any more. When I left I placed the settlement of everything, — the collection, — and gave the party a power of attorney."

Now, please your Honor, the fact was this: Bayler was Drawbaugh's debtor, *as the accounts produced in court show*, every day, for years along, until finally Drawbaugh heard there was going to be some doubt about Bayler's paying, and then he bought a lot of lumber from him, in order to cover the balance that was due him. He didn't want the lumber at all. He bought it to balance his account, and had to sell it to get his money. Not knowing the exact balance, he bought about fifteen or sixteen dollars more than the debt; and that balance was the subject of a subsequent suit (Drawbaugh, defts, ii, 1018).

Mr. HILL. — Where do you get that?

Mr. DICKERSON. — That is what was done, exactly what was done. That was the transaction, and the account shows that Bayler was in debt to Drawbaugh all the time, right along, and may it please your Honor, Bayler was called to prove that Drawbaugh applied to him in vain for money to patent his invention. That is what they called him for, — to prove that Drawbaugh applied to him for money to patent his invention. The very day when the supposed conversation occurred between them, as the books show, Bayler owed Drawbaugh twenty-four dollars and some odd cents, — I am going to be very accurate, — twenty-four dollars and some odd cents, that very day when, according to their testimony, Drawbaugh was begging him to lend him some money to get a patent for his telephone. (See brief, p. 354.)

The next charge against us is, suppressing evidence, and the most infamous accusations were made against us. If they are true, Mr. Storrow and I should stand in the condemnation of every gentleman, and of every court.

Dan's biographical story is the foundation of one of these charges. Daniel Drawbaugh was a man of extreme diffidence and modesty,— we know that he was, sir, because a witness has sworn so. There are some circumstances that might cast some doubt upon it; but it must be true, because it was testified to by a witness who has not been impeached, and, according to the rule which the other side laid down for the decision of this case, we must accept it to be true. Daniel Drawbaugh being a very modest man, there was a history of his county or township being published, and he wished to have his biography published in it. The person who was getting up the biography applied to Drawbaugh for a subscription, and he agreed to subscribe for this history on condition that his biography should appear in it; otherwise he didn't want it. Your Honor knows that Drawbaugh is a man of exceeding bad memory, — I think there has never been in my experience a man of so bad a memory, — and he would therefore naturally wish to have a printed biography of himself about him, so that he might see who he was, from time to time, and know what he had done. Therefore he proposed to subscribe on condition that his biography should be printed; and the agreement was made between him and Scott, the publisher, that Drawbaugh should furnish his own biography, — should supply it himself.

Well, I think your Honor will take a sort of judicial notice that that is the general history of this sort of thing; but here it was specifically proved. Here it is specifically proved that the contract was that Drawbaugh was to furnish his own biography, and that that contract was made as the consideration for the subscription.

The COURT. — By whose testimony does that appear?

Mr. DICKERSON. — By the testimony of Mr. Scott, to which I will refer. It is on p. 716, complts, Vol. I. Mr. Scott is asked: —

"*Q*. 15. Did you make any agreement or arrangement with him about publishing his biography in your proposed book, and, if so, state generally the nature of that arrangement, and what was done on that occasion about preparing his biography?

"*A*. Yes, sir; I agreed to publish a short biography of subscribers at that time, and, in order to obtain this biography, I had printed slips with questions to be answered. I commenced asking him the questions to fill up the slip, and had it partly filled up, when I found that I couldn't get in all he wanted on my slips," — your Honor sees that is no ordinary slip that will take in the inventor of the telephone. He fills a page in history that reaches through time. No mere slip is of any use to him, — "and I told him he had better write out a little sketch of what he wanted for himself, *and he thought so too; and we agreed to leave it that way, — for him to write out a short sketch of his history and mail it to me.*

"*Q*. 16. Did you afterwards receive that sketch by mail?"

Then, of course, his partner, not liking that especially, piled in his objections, as he does all along, by the ton.

"*A*. *Yes, sir.*"

Now, sir, Drawbaugh made the contract that he was to furnish his own biography to this book. Well, greater men than Drawbaugh have done that thing. Judge Catron, judge of the Supreme Court of the United States, when this business of publishing biographies for pay first began, wrote his own biography in Livingston's "History of Great Men," and he began it in this frank and manly way: "Other people pretend that they don't have their own biographies written by themselves, or for themselves. I make no such pretence. I write this." That was honest, and it was so published. That was Judge Catron, of the Supreme Court of the United States, and it is to be found in Livingston's biographies to-day.

Then, may it please your Honor, we heard of this autobiography and went to hunting it up. It turned out that two editions were published of that book; that is to say, probably only one edition, but a good many of them were published without having the biographies in; the editor didn't like that kind of stuff; he didn't want such trash in his book; and he probably printed only as many as would go around for the people who paid for them, and left it out of the others. It was, no doubt, a little fraud on them; but that was the way he did it, and he published the greater part of the books without it, but he published some of the books with it.

But Mr. Storrow had got on the track of this biography, and he was hunting it up. He was informed that Drawbaugh wrote it, and he was hunting up the manuscript. He wanted to get Drawbaugh's manuscript with his own story in. The book itself was in public circulation; Drawbaugh had it, and everybody else had it that paid for it. It was a public record known to everybody; but to get at who wrote Dan's biography was the thing that Mr. Storrow saw was very valuable in this case, because it contained an allusion to the telephone written by himself.

We were hunting that up. We scoured the country; we got witnesses from the West. The whole story comes out here. When Mr. Hill had piled up his contumely upon Mr. Storrow yesterday in this court room with opprobrious epithets, he finally ended with the statement that Mr. Storrow was hunting for that manuscript of Drawbaugh for the *purpose of destroying it*, and that this Court would never have seen it if he had got it. Well, there were two views of that accusation, that struck two men differently; it struck me in that comical and ludicrous way that made me laugh. It struck my brother Storrow with indignation; he didn't see the fun of it, for his honor was assailed. It takes a great deal to move him, but this did, and he said a very indecorous thing; he said, "You lie, sir." He ought not to have said it *here*, but he did. The ludicrous side of it was the assumption that Mr. Storrow would have destroyed the paper he was looking for, which was the manuscript of a published book in common circulation, for the purpose of suppressing the knowledge of the fact that Drawbaugh wrote it. That was ludicrous. But, blinded by rage and interest, Drawbaugh's partner attempted to stab the character of Mr. Storrow by an imputation, which, on its face, was so perfectly ludicrous that no man except the man assailed could have failed for a moment to have seen its absurdity.

And that is what he did here yesterday, and he founded it upon this, may it please your Honor: We had two copies of this book; and the first witness that we called was the man who wrote the account of Drawbaugh's shop as a part of the history of Eberly's Mills, Mr. Nesbit. He wrote nothing else. Other writers wrote the history of different townships, and of other places; and other writers, namely, the people themselves, wrote their biographies. We called Mr. Nesbit to prove that he wrote that history of Drawbaugh's shop, and that he got the information from Drawbaugh himself in his shop, and that Drawbaugh never said "telephone" to him. We put him on the stand, and proved that by him, using a copy which did not have the biographies. We had, however, in the next room Mrs. McDowell, the person who condensed the biographies in the publication, to prove that the original was in the handwriting of Drawbaugh. She was in the next room, with a copy of the book she has to do with. She lived in Cincinnati. We had brought her from Cincinnati to Philadelphia to testify, and she was the next witness who went upon the stand after Nesbit, — Nesbit, then Mrs. McDowell.

Mr. Hill, seeing what was coming, and wishing to make a diversion, such as he has attempted here for a day or two to make from the merits of the case, when Nesbit was on the stand called upon Mr. Storrow on the record to produce a copy of the book *that had the biography in it*, as if that was a matter which could by any possibility be kept private; and upon that call he assured your Honor yesterday that Mr. Storrow's intention was that no copy of the book with Dan's biography in it should ever be shown to the Court; that he was trying to "*palm off*" on you that copy of the publication which did not have the biography in it, for the purpose of showing that Drawbaugh was not the inventor of the telephone. *He told you that when he knew, as we all now do, that in the next room was the woman who came from Cincinnati to prove that she condensed the biography from Drawbaugh's own manuscript,* *and that we were trying to prove it; and that the book was a public one, and a copy of it in his own hands.*

But he made that little diversion, — that piece of fireworks, — and then came here and said to your Honor, "If I hadn't done that, this testimony would have been suppressed, and your Honor never would have known that Drawbaugh's biography was mentioned in that book," — in which he mentions the telephone.

In that examination, however, Drawbaugh's partner produced out of Drawbaugh's possession what he says was the *original* of the printed biography, in the handwriting of a man named Hull, which was at once taken into the next room and shown to Mrs. McDowell, and she was asked whether it was the paper she copied from, and she said it was not. That paper was the draft which Drawbaugh had got Hull to write, and from which he copied off the copy that he sent to the publisher, Scott, so that the original, left in Drawbaugh's possession, was in Hull's handwriting. Drawbaugh is not literary in and of himself; he required somebody else to write it for him, and he had got Hull to do it; and then he copied it off and sent it to the publisher, where it was condensed by Mrs. McDowell, at that time engaged in doing that literary work.

Then we called Mrs. McDowell the next day to prove, — not the next day, because Thanksgiving Day occurred, and she had to wait over Thanksgiving Day, — and then she was called to prove what I have told your Honor about it.

Mr. Hill. — Five or six days afterwards.

Mr. Dickerson. — At the next meeting.

I have warned you several times not to interrupt me, because you get hurt every time, and now I am going to hurt you again. Mrs. McDowell was called on Monday. The examination of Nesbit was on the preceding Wednesday. Thursday was Thanksgiving Day, and the examination was adjourned over till Monday, to enable both parties to go home on Thanksgiving Day; and on Monday she was called, and she was asked this question (complts, i, 708): —

"*Q*. 13. On Wednesday last, Nov. 29, 1882," — says Mr. Storrow in the question, — "Mr. Ott, the examiner, showed you, at my request, a manuscript in pencil, marked 'Exhibit Hull Manuscript'; was that or was it not the manuscript which your father gave you to write this biography of Daniel Drawbaugh from?

"*A.* It was not. [*The examiner notes that he did so show said exhibit to the witness immediately after adjournment on Wednesday.*]"

There was this witness from Cincinnati, on Wednesday, in the next room, to whom this piece of paper *was shown that day;* and now Mr. Hill, knowing that to be so, says that "there were four days elapsed, and therefore there was time enough for us to have got up that fraud that we have since come in here with." He told your Honor that we concocted the *pretence that Mrs. McDowell was to prove Dan's autobiography* as an excuse for our attempt to suppress from the Court a published book, one of which was in Dan's possession, and had taken four days to do it in, when he knew that Mrs. McDowell was in the next room with the proof the same instant that Nesbit was examined, and was waiting, absent from her home in Cincinnati, to be called, and would have been called that day if the court had not adjourned over Thanksgiving.

Now, what is the next thing about this affair? Mr. Hill puts in his brief this statement (p. 261 of his brief): —

"A great many facts appear in the case which curiously emphasize the worthlessness of negative evidence. Take, for one example, the testimony of J. C. Nesbit. He was at Drawbaugh's shop in July or August, 1878, with one Hull (who died in the spring of 1879), to procure materials for a historical sketch of Milltown, to be published in Wing's 'History of Cumberland County,' and was called to prove that Drawbaugh did not mention the telephones. In connection with his testimony, the complainants introduced the history containing a brief sketch of Milltown, and even of Drawbaugh's shop, but silent as to telephones. In cross-examination, however, the defendants produced a manuscript made by Hull," — now we are coming to the statement, — "*made by Hull at that very visit, which conclusively showed that Drawbaugh did mention the telephones, — both carbon and magneto, — as his invention;* and upon the defendants' demand, the complainants were obliged to put in another copy of the same history, which was printed at the same time, with the copy they first introduced, and which contained in an appendix the substance of Hull's manuscript statement about Drawbaugh's telephones. Here was shown not only a reprehensible effort on the part of the complainants to DECEIVE THE COURT, by introducing an incomplete book, but also an unanswerable rebuttal of the witness's negative testimony by means of *a writing made during the very interview which formed the subject of his deposition.*"

The italics and capitals are mine, the meaning is his.

The important words here are "*made during the very interview.*" The subject of that is Nesbit, who swears, "When I was taking the notes that I published in the history, *he said nothing about telephones.*" But Drawbaugh's partner now says, "Yes, he did." How does he prove it? Why, he pulls out of his pocket the biography which *he says* Hull wrote *at "that very interview"* with Nesbit, and therefore Nesbit must have lied, who said that telephones were not mentioned.

Now, may it please your Honor, if Hull did write that biography at that "very interview," then, of course, the conclusion is good. If it was not written at that "very interview," — and nobody knows better than Drawbaugh and Drawbaugh's partner what the truth is about it, — then the conclusion is false; and that falsehood is made the basis of vile accusation against us. What is the fact?

Mr. HILL. — I want to offer your Honor the original of Hull's manuscript, the original notes made. Here it is. [*Handing the Court two leaves of paper.*] Your Honor can see that they are parts of the same paper, written at the same time, from the marks and corrections on both sheets.

Mr. DICKERSON. — That is, anything that is written upon two halves of a sheet of paper was necessarily written at the same time. Any man that cannot see that must be a dunce. I write a note on my table and tear the sheet of paper in half, and then come back in a week and write another letter on the other half of the same sheet of paper; *ergo*, they were written at the same time. That is logic. But the paper shows that the contrary is true, and there was no attempt to prove this supposed coincidence by testimony.

But, your Honor, I am not talking about that kind of logic. I am talking about testimony now. Mr. Scott is the witness (complts, i, 715): —

"*Q.* 10. Did Mr. Daniel Drawbaugh subscribe for this history; and, if so, will you point out his subscription, in order that the examiner may copy it into the record?

"*A.* He did subscribe. [*Witness points out the subscription in the subscription book.*] 'We, the undersigned,' and so on."

Here is the list of all the subscribers, and we come down to Aug. 21, 1878. It is the original paper: —

"Daniel Drawbaugh, one copy, August 21, Eberly's Mills."

On the twenty-first day of August, Daniel Drawbaugh made that subscription.

The COURT. — Of what year?

Mr. DICKERSON. — 1878, when the Bell telephone had filled the world.

The COURT. — Is there reference to that in the brief?

Mr. DICKERSON. — Oh, yes, p. 222; there is no doubt about the date of the subscription. Daniel Drawbaugh, on the twenty-first day of August, 1878, subscribed for that book. It was published in February, 1879, and Drawbaugh then received his copy. Now, says Mr. Hill, this biography was written by Hull at the same time when Nesbit, the writer — not Scott, the publisher — *when Nesbit, the writer*, got his information from Drawbaugh which he put into his history. That is what he says. He says he proves it by the looks of that paper.

Well, the looks of the paper are not quite as good evidence as the testimony of the witnesses as to the dates. Nesbit testifies that he took his order from Scott to write the history on the 7th of July, and he finished it three weeks before the 1st of September, which was the time when his school began; he is a teacher; *he finished it about the 10th of August.* He had finished his long history of the whole town in manuscript on the 10th of August, which was eleven days before Daniel Drawbaugh made the contract with Scott under which he was to furnish his biography; so that eleven days before that time Nesbit had finished his history, and it was some time between the 1st of July and the 10th of August when he went to Drawbaugh's shop for his facts about Eberly's Mills. He doesn't remember what day it was, but it was some time between the time he took the contract to write the history and the time when he finished it; it was within forty days, — say from the 7th of July to the 10th of August, some time in there,— that he saw Drawbaugh and got his materials. On the 21st of August, ten days after he had written his history, Scott, the business man, went there, and Drawbaugh agreed to subscribe for a copy if Scott would publish his biography, and did so, and *that is the first that ever was done about the biography.*

And now his partner comes here and tells you that in fact that biography was written in Mr. Nesbit's presence a month before, when he went to get his information about the town and the mill, and that therefore Mr. Nesbit doesn't tell the truth when he says the telephone was not spoken of at that time. There is no other evidence bearing on the subject.

That is the testimony in the face of which this infamous charge is made against us, in this presence, that we have corrupted the testimony and suppressed the truth, and that we have attempted the crime, may it please your Honor, of keeping away from the Court the fact that *Daniel Drawbaugh himself wrote his own biography,* — a most important fact for us to prove, and to prove which we spent no end of time and money: a fact too one would think was rather difficult for us to conceal from Drawbaugh.

But we had an elegant piece of commentary yesterday. Mrs. McDowell swears to two things. First, that her father, who was Mr. Scott, gave her this manuscript from Drawbaugh, and told her it was Drawbaugh's manuscript. That was *four years before she testified,* and she remembered that conversation. Thereupon Mr. Hill stood up in this Court and said to your Honor that it is not possible for human memory to recall a conversation of four years ago and tell the Court what it is, that human memory does not act so.

Well, if your Honor please, I agree in general terms that human memory is not very reliable about a conversation that occurred *four years ago.* If this case depended upon proving that conversation, I shouldn't have a great deal of confidence in it. I would agree with anybody who should say that human memory is very fallible; but what do you think, may it please your Honor, of this confession of Drawbaugh's partner, when the great bulk of his testimony depends upon witnesses who say that ten years ago, twelve years ago, sixteen years ago, they heard Drawbaugh say so and so?

Does memory improve, like Madeira, by the years in which it is kept? I think, may it please your Honor, that it is like currant wine, it gets sour.

Why, may it please your Honor, in this case Henry Drawbaugh, the brother of Daniel Drawbaugh, and his chief witness, swore, in his direct examination, "The first time I ever saw any talking machine was in 1872." He positively fixed it, if his testimony fixed anything. No doubt he and his brother had agreed about it before he went on the stand.

Well, after a while that piece of testimony began to look very ugly. How was it that an invention that had been completed and known to the whole community, and published to everybody, for five years, was not known to the man's own brother? How did that happen? They had to mend that somehow. That was a very damaging hole, and they had to mend it. And how did they try to mend it? Why, they called a couple of land surveyors, who were running a line in the woods, — and they make your Honor sure about that line, because they produce the record showing when it was run, — there is no doubt about that date, and *therefore* of course no doubt about the rest of the story. See brief, 396; app. 112, 719.

And what did they say? Why, *they heard a man say that he heard Henry Drawbaugh say that his brother Dan had a talking machine as early as* 1867, *or some such time.* They heard one man say that he heard another man say that which contradicted their own witness in respect to the date when he knew it. And then they stand up in court before your Honor and say that human memory as to a conversation four years old is worth nothing. But they tell you in the same day, and with the greatest earnestness, "We have proved without a doubt that Henry Drawbaugh knew all about this talking machine in 1867, because we have got two land surveyors who heard a man say that he heard Henry Drawbaugh say so some years before, — sixteen years before, — *sixteen years before.*"

May it please your Honor, whenever a complicated fraud is got up, it is impossible for human nature to make its parts match. Whenever, in the providence of God, a knave is made, a fool is put inside of him every time. If it were not so, the world would be uninhabitable. The protection which virtue has against knavery is the fool inside of the knave.

Now, sir, we come to another suppression on our part, and this is as bad as any of them. It is the suppression of the Miller testimony. Miller was called by the defendants to prove —

The Court. — Is he the man from the West?

Mr. Dickerson. — No, sir, I will come to him; this man was the station agent at Whitehill, and kept the co a word of evidence man Miller was called by the defendants to prove certainly the time. a talking machine in Drawbaugh's hands in 1876, w the testimony by chine was A, — that round machine. He had seen it coal business road station where Drawbaugh had shown it. He then said that Drawbaugh had talked to him about it *before that time, August*, 1876. It wasn't a very valuable piece of testimony, in view of the date of Bell's patent, but it was a very good thing to date another thing from, — that he had talked to Drawbaugh *before that time about it*, although Drawbaugh hadn't shown it to him before that time.

Well, that was very good-looking testimony. The question then arose, when Dan talked to Miller about it, and Miller fixed it by the circumstance that he went to collect a bill for coal, of his father's, and at that visit Dan talked to him about his telephone. Miller also helped the poverty dodge a little by saying that he didn't press his bill because he was satisfied Dan had no money. Well now, we have got something logical. We have got a good connection. It was a bill of coal; he went there to collect it.

Thereupon Mr. Storrow went into bookkeeping, and he hunted up Mr. Miller and his books, and this turned out to be the fact: Mr. Miller, the father, who kept the coal store, — it was called the "warehouse," — where they sold coal and such things, next to the railroad station, came there to that store on the 1st of January, 1876, — *came there on the 1st of January*, 1876, *and not before*. The people who occupied the store before him were two or three other tenants; all of their names and dates are given exactly, and they came in one after another, until Jan. 1, 1876, when Miller's father took it; and this young man, young Miller, having been station agent for the railroad company, took charge of the warehouse for his father, which was at the station. He began that business then, and afterwards he opened an account with Dan Drawbaugh for coal.

The first item of coal on that account was in *December*, 1876. The first *bill therefore* he had against Daniel Drawbaugh was in December, 1876. Well, it isn't probable he went to collect any bills before he had them; and therefore it isn't probable that the conversation his direct examinatio bill occurred before December, 1876. Then machine was in 1872 against Drawbaugh for coal, running along anything. No do 1878, and we produced those books, if your he went on the. We produced Mr. Miller and his books, and then Mr. Storrow said to him: Now give us the *account from the beginning of 1876*, — Drawbaugh's account, —*from the beginning of 1876 until the present time.*

The beginning of 1876, may it please your Honor, was the beginning of his business. It was the beginning of his account. Jan. 1, 1876, was the opening of the books, and Mr. Storrow took it from the beginning, and said, "Give us the whole account"; and he did.

Thereupon Mr. Drawbaugh's partner stood up here and said, "This is a fraud. Why didn't Mr. Storrow ask him for his account before Jan. 1, 1876?" and he insinuated to the Court that there was an account before that time on those books that we didn't go into. Well, he knew as well as we did — there it is on the record — that Mr. Miller went there Jan. 1, 1876, from another place, and began his selling of coal in that year, and sold the first ton of coal to Drawbaugh in December, 1876, eleven months after he first went there.

And then, may it please your Honor, "it was in warm weather," says young Miller, "when Dan showed me the machine on the railroad station." He continued to be the railroad station agent for a long time, — 1876 to April, 1878. "He showed me the machine in the summer some time." It wasn't the summer of 1876, because he hadn't sold any coal in the summer of 1876; and he went to collect his coal bill and had his talk about the machine before he saw the telephone receiver **A** at the station.

Now, that being the fact on the record, and the whole of it, we are held up here to the contumely of this court as having suppressed the testimony in some books that were *supposed to exist*, when the man wasn't there, and had no such business, and your Honor is told, "What do you think of counsel in a case that would do such frauds as that?"

Mr. Hill. — Do you mean to say that Mr. Miller was not in business at Shiremanstown or White Hill in or prior to 1876? The man didn't say he collected a bill for coal bought at White Hill; for coal bought of his father, he said. There is not a word of evidence about his having bought coal after 1876. That is certainly the time.

Mr. Dickerson. — Oh! you seek to supplement the testimony by saying, "True it is he was not at that place in the coal business in 1876, but he was at Shiremanstown, four or five miles off, and probably he sold coal from Shiremanstown or somewhere else.' Well, if he did, this young man did not sell it; this young man didn't have charge of it; this young man was at that station nearest to Drawbaugh's house — the Whitehill station. And now, says Mr. Hill: "Oh, the father was in the business formerly half a dozen miles from there, and *probably* this amount might have been on some transaction between them at that time. Why didn't you go to his father and get the books of that place, not get the books of the place where the transaction occurred?"

Mr. Hill. — He said he went to collect the account for his father!

Mr. Dickerson. — You don't make anything by that. You only get hurt every time; it only makes the subterfuge the more ridiculous. The more you utter it the more absurd it becomes.

As my brother Storrow reminds me, *they* afterwards called this young man Miller again about this very transaction. They never asked whether this bill did not relate to something else besides that coal business, in which he was the agent of the father, and elsewhere than the store where he was selling coal at the time the transaction occurred. They didn't ask him that question. Of course there was no other coal bill. Men don't cart a ton of coal six miles when they can buy it next door.

The earlier occupants were Zacharias & Graybill, who quit in September, 1875, after which the owner, Jackson Free, closed up their business. (See defts, iii, 183–5. See our brief, p. 305.)

I now come, if your Honor please, to those Western witnesses, whose testimony is important in several aspects, both upon the merits of the case and upon the accusations against us of having suppressed the testimony which the Court was entitled to know.

There were several of them: the Ditlow brothers and a man named Kahney, of which name there are more than one. We were attacked ferociously, with burning epithets, for having manufactured testimony and procured witnesses to "swear straight," — not doubtful or hesitating; and there was read to your Honor the testimony of a man named Ditlow, to impeach the character, professional or otherwise, of Mr. Storrow. He was asked this question (defts, iii, 523): —

"*Q.* 19. Did you get any instructions from them [*i. e.*, Mr. Storrow] as to how you were to give in your testimony; if so, what?

"*A.* Yes, sir; we were trying to fix dates. Mr. Storrow would ask me questions about dates I could not remember, — I could guess at it, so and so. He told me when I went on the stand not to *guess* at it, *give a straight answer*.

"*Q.* 20. What do you mean by a straight answer?

"*A.* Not to say, 'I believe it was so, or I think it was so,' but to say it either was so or was not so."

Upon which a diatribe was delivered here against Mr. Storrow and against our methods of procuring our witness to swear, when we told them to swear straight, and not to guess at it.

On the next page of the record, may it please your Honor, this witness was asked another question by Mr. Storrow (p. 525): —

"*X Q.* 36. Mr. Storrow cautioned you that upon the stand you should not guess nor say you guessed, but should answer positively one way or the other, if you knew; and *if you didn't know, say that you didn't know, and not guess about it:* is not that the fact?

"*A.* Yes, sir."

That is the *whole* of the testimony of which Drawbaugh's partner read a part. If these instructions to witnesses were put in a text book, they could not be put more accurately than that: "If you know, say you know; if you don't know, say you don't know; but don't guess at it: that is not evidence." And thereupon we were denounced as training the witness to swear falsely because we told him to tell a straight story; and Mr. Hill took care not to read the whole of it: "If you don't know, say you don't know, and don't guess about it."

And then your Honor was asked, "What do you think of the parties and counsel that make up such a record as that?" I retort the question.

The Ditlow story is this. It is a very interesting one. It is as plain a fraud on the part of these defendants to procure false testimony as ever went on the records of a court of justice.

This mill of Drawbaugh's was a loafing place, where, on Sundays and idle and rainy days, the loungers and farm hands and loafers assembled to play cards, to tell stories, and amuse themselves, as happens in country villages of that kind. Among the fellows that were there were the Ditlow boys and the Kahney boys, who were not a very high-toned set of "gentlemen," — trappers, who made a living by poaching around, trapping, and doing a day's work here and there, — laborers, — that was all. But they were such companions as Drawbaugh had. If you want to know what occurs in a man's house, you must call his companions that frequent his house. We cannot call gentlemen, if his house is frequented by loafers; we have got to call his companions, not ours, and we called the Ditlows. To their story hangs a tale that pulls down an immense card house in the middle of this case, — an immense card house.

It will require a little attention to detail to comprehend it entirely. George Drawbaugh was the nephew of Dan and one of their principal witnesses, — a man very much relied upon to prove their case. He was a fellow very much like the Ditlow boys and the Kahney boys, and he swore that the first time he ever saw what they called a talking machine was in 1870, when he was engaged in building a wagon for the purpose of peddling water rams.

Drawbaugh was a manufacturer, among other of his multifarious employments, of water rams; and he and a man named Sadler formed a partnership for the purpose of peddling water rams around the country. Water rams are, of course, very much used in farming countries, where they have little streams of water, and it is a respectable mode of making a living, and no doubt a profitable business. He tells us he formed a partnership with Sadler to peddle rams. George Drawbaugh made a wagon, or repaired a wagon, which was to be used in this peddling business; and he testifies that he made that wagon in the year 1870, and he proved it by the most circumstantial set of associations and by book accounts. He swears that he bought the lumber for it from Mr. Lee; and Lee's books are brought into court to prove that he bought lumber in the spring of 1870, and that he never bought any afterwards. It was therefore certain that it was in 1870. Daniel Drawbaugh himself also hangs a date upon the time that wagon was made. The

Ditlow boys, I say, were living in that neighborhood at that time, but are now in Indiana. We found them out, and called them to prove that the first time they ever heard of the talking machine in Drawbaugh's shop, where they had been spending their Sundays, their rainy days, their idle time, the companions of George Drawbaugh for many years before, — the first time they ever saw or heard of that talking machine was in 1877, — in the spring of 1877, — *when George Drawbaugh came into the village store and told them that Dan Drawbaugh had got a talking machine.*

Joseph Ditlow and Abe Ditlow left that place immediately after that, in the spring of 1877, and went West, to Indiana. Joseph had with him a kit of trapping tools, in which was a stove that Dan Drawbaugh had made for him, and this kit of tools he sent at that time out West, and he happened to have preserved the original bill of lading of the railroad for this kit of tools, which he produced to us when we called him as a witness; and he put his date on that bill of lading. It was just before he left that George Drawbaugh came and told him of the talking machine in the country store, though he had been for years before that an habitué of Dan Drawbaugh's shop and had never heard of such a thing up to that time.

His brother Abe was called in the same way. They were seen by us six months, I think, before they gave their testimony, and they had all that time to consider, and then came upon the stand and testified in the most positive manner that they had never seen or heard of such a thing, although they were there, day in and day out, for years before, until they heard it in the spring of 1877, in that store, from George Drawbaugh. After they had got through with their testimony, and these others with them — Kahney, whom I will speak of separately, — after they had got through with their testimony for us, they turned up at Eberly's Mills and spent a few days there with the Drawbaugh people, and on Sunday spent the whole day in Drawbaugh's shop, where Daniel Drawbaugh and George Drawbaugh and the rest of the family were talking over the telephone case.

On that occasion, Daniel remarked, with that sympathetic generosity which naturally belonged to an expectant millionnaire, that if he won his case, — "*he would remember his friends.*" The prospect of pouring half a million or so into that little village was a very glittering one, and with Drawbaugh to "remember his friends" was very seductive. He would remember his friends; and they talked it all up. The party of witnesses then went West, and presently afterwards the Ditlows were brought back to swear that they were entirely mistaken on the occasion when they first testified, and that, in the place of being 1877, it was much earlier.

Now our wagon date is coming to the front. It was 1870, they say, when the wagon was made and when George Drawbaugh first saw the talking machine. Joe Ditlow went West the first time in the spring of 1870, and boarded with one Reed for a short time, which is fixed by book entries as in May, 1870, and no doubt correctly fixed. Joe has been in the habit of going out West from time to time, beginning in the spring of 1870, at which time he boarded with Reed for six weeks; and they called Reed to prove that Joe Ditlow, *in the spring of 1870*, told him that Daniel Drawbaugh had got a talking machine, and described it. Upon this testimony of Reed, therefore, Ditlow corrected his date, and carried back his knowledge from 1877 to a much earlier time. In order to make the new story match with the one Ditlow had sworn to for us, in as many particulars as possible, so as to correct as little as possible — only the date — they put it to him as follows, when he was recalled (defts, iii, 521): —

"*Q. Where and from whom did you first hear* that Daniel Drawbaugh had a talking machine or anything that was claimed to be a talking machine?

"*A. The Milltown store, from George Drawbaugh.*"

So far the two stories concur. 1877 was the date sworn to for us, and he carried it back some years, and knew he was right, only because Reed said he had been told of it in 1870. *But in both cases he swore that his knowledge was from George Drawbaugh.*

Now George Drawbaugh knew of it for the first time when the wagon was built, which he swore was in 1870. It turned out, *and it stands admitted here, that that wagon was not built until 1871.*

But George Drawbaugh swore he knew of it *for the first time* when that wagon was building, and from him Joe Ditlow got his knowledge, which, therefore, could not have been till 1871, and therefore *Ditlow did not tell it to Reed in 1870.* Reed may have been told of it in 1877, when Ditlow was there again. Ditlow has lived close to Reed ever since 1870; but he certainly was not told of it before Ditlow himself knew of it.

The whole card fabric tumbled. It all depended upon that wagon, which, in place of being made in 1870, was made in 1871; and the whole lie, which was hung upon that wagon, came down with a rush.

Then Mr. Hill told your Honor yesterday that we had corrupted that Ditlow family, when we got them for witnesses, by obtaining *from the railroad a copy of the bill of lading of Joe Ditlow's kit in 1877*, and showing it to them, and thereby making them believe that that was the time, in 1877, and not away back in 1874, which was the first time Joe Ditlow had gone West.

But, may it please your Honor, that bill of lading, in place of being got *by us* from the railroad company, and shown to the Ditlows, *was produced by Joe Ditlow himself, and shown to us as proof of his date*. It was the original bill of lading in his possession, given to us for the purpose of proving his 1877 date, as Mr. Hill knew; and then your Honor is told that *we got* it from the railroad, and corrupted Ditlow with it, and made him believe it was 1877, whereas it ought to have been 1874! That is a lovely story. Nobody knew the truth better than the person who made that statement to your Honor. The original was produced out of Ditlow's pocket; it is on file in the case, and, in place of being used by us to corrupt Ditlow, it was Ditlow's own basis on which he swore (complts, ii, 959).

The fact was, may it please your Honor, that twice when Joe Ditlow went out West he carried with him his kit of hunting implements, — once in 1874 and once in 1877, — so that there was an opportunity to make a false association of ideas. The Western people whom they called, who knew about this thing from Ditlow the year before George Drawbaugh had told Ditlow of it, *according to their own story*, say they were told about it when Joe Ditlow was unpacking his kit of tools. In the very act of unpacking this stove, he said to them, "See here, this stove was made by Drawbaugh, who has made a talking machine down in my country." That kit of tools he carried in 1877, and produced his bill of lading to prove the date. All this matter of the Ditlow family is fully stated in our appendix, p. 585.

Dan got those Ditlow boys down to Milltown to spend a couple of days with him there — two or three days with him — just after they testified for us, and then sent them out West; and then he brought them back to swear their date back, and to produce witnesses that it was 1870, not 1877, when Joe Ditlow knew it. The moment you fix the wagon date, down goes the whole fabric of lies — the whole of them.

There is another lot of the same class of witnesses here. A man named Kahney was a witness for us, and never knew of talking machines before 1876, and afterwards came back to testify that he was entirely mistaken, and that he did know about them years before,— the exact year I will not mention, because it is not of the essence of the matter; the question is, before or after; that is all. He never heard of it until, as he testified to us, until after Mr. Bell's invention. They recalled him to prove he knew of it a long time before. How did that come to pass? He was taken down to Drawbaugh's shop after he testified for us, along with the Ditlow boys, and while he was there with Drawbaugh they talked the subject up, *and Kahney agreed with Dan to find a man out West, by the name of Smith, who would come and testify that Kahney told him about the talking machine long before he had sworn for us he knew of it.* An unknown Smith was to do the Reed business over again.

He was to go out West and hunt up a man who was going to prove that he, Kahney, had told him about a talking machine long before Kahney had sworn to us he first saw it and heard of it.

That is the little contract that he and Dan Drawbaugh made with each other, and he started out West to carry it out, and he went to Chicago to hunt up a man by the name of Smith to prove that he had lied on the stand. Kahney goes to Chicago at the expense of this gang to find a man by the name of Smith to swear that Kahney told him some years ago of something that Kahney had just sworn did not exist. It seems that Kahney did not find that his man would swear to any such thing; and when it is considered how simple a thing it was to get some villain for a price to do this, we must conclude that Kahney wasn't smart: but Kahney found himself, and he wrote back a letter to Mr. Drawbaugh from a place called Triumph — quite significant (defts, iii, surbtl, 225): —

"TRIUMPH Jan the 1 [should be Feby 1] 1883.

"FRIEND DANIEL: —

"I thought I would right you a few lines to let you know that I got back all right again and to let you know that *last night there was some things came to my mind the first that I ever heard of a talking meshien it was in seventy five and know exactly when it was or can find out with very little troubel and thare was a man told me in mendota today and he said he knew of you talking of having being working at the talking maschien in the year of seventy* and LET ME KNOW WHETHER I SHALL SEE SMITH OR NOT right soon for I may leave here soon with this I close my Respects to all address Mendota Lasalle County Ill."

He had not yet seen Smith, but he might come across him in his travels, though he had just come from Mr. Dan Drawbaugh's place, where they had agreed that he should go and hunt up a witness to prove he was a liar. As he writes, "Last night there was some things came to my mind." These people put him on the stand and produced that letter, and Dan's partner asked him a question in order to prove the virtuous nature of it. Let us give them the benefit of that question, because they need it very much (defts, iii, 230): —

"*Q*. 49. And you wrote Mr. Drawbaugh, informing him of it in ORDER THAT NO INJUSTICE MIGHT BE DONE BY THE MISTAKE WHICH YOU SAW THAT YOU MADE AT PHILADELPHIA: is that the way of it?"

In order that no injustice might be done by the mistake which was made in Philadelphia; is that the way of it? We do not desire to take away any of their virtue: it is their right; it is right that the witness should have the benefit of that virtue.

"*Ans*. Yes, sir."

He did it in order that no injustice should be done; and that was why he wrote that letter.

Well, it happened, may it please your Honor (they call him a gentleman; as they associate with him, I presume he is), that this "*gentleman*" wrote another letter, and he wrote it to Mr. Storrow (defts, iii, 243): —

"TRIUMPH March the 8 '83.

"FRIEND STORROW

"I thought I would rite you A few lines to let you know that I got home all right and am feeling as good as ever and to let you know that I herd from Dan and that he wants me to come back again and I have thought over some of my deposition and I find that I have testified to some things that I wasn't right about and would right them if I could or would get a chance and hope that I will I do now believe that thare was a telephone thare as far back as 1873 and know thare was and am glad it has come to my reckalection and am very sorry that I have give in the evidens that I have I have had telephone on the brain ever since I got back and I want you to WRIGHT TO ME AND TELL ME WHAT I HAD BETTER DO I CAN KEEP OUT OF THEIR WAY IF YOU SAY SO DONT FALE TO RIGHT AND GIVE ME ADVISE and tell Comfort that I still play seven up sometimes" [I should think he did, but, unfortunately for him, he did not hold high, but low this time,] "with this I stop your Friend

"ORLANDO B. KAHNEY.

"Adres Triumph Lasalle County Ill."

That letter was addressed to friend Storrow, from Triumph, and he asks friend Storrow to bribe him.

He says, "I CAN KEEP OUT OF THEIR WAY IF YOU SAY SO." Well, friend Storrow, of course, was not in the business of corresponding with that kind of person, and of course he did not make any answer to it.

Then he writes another letter:—

"WARNER HOUSE,
HENRY KOPPEL, Proprietor.
MENDOTA ILL. May the 23 1883.

"FRIEND STORROW

"I thought I would rite you and let you know that I am getting along well and to ask an advise of you whether I HAD BETTER OR NOT COM AND TESTIFY ON THE OTHER SIDE DAN HE SAYS HE WANTS ME TO COME rite and let me know what you think about it.

"ORLANDO B. KAHNEY.

"Address Mendota Lasalle County Ill."

Well, of course we didn't communicate with this "*gentleman*," and this gentleman came upon the stand and had forgotten of course about these letters to Mr. Storrow. He told how his conscience had moved him to write to Dan Drawbaugh, in order that injustice might not be done to anybody, when the whole scheme had been concocted by him and Drawbaugh before he went West; and in consequence of that he had come back on the stand, and then these letters were put to him. Of course they were his; and upon that, may it please your Honor, Drawbaugh's partner puts into his brief the most infamous charge that we had suppressed that testimony, or attempted to; that we would not consent to have this man back on the stand; that we attempted to deceive and mislead this Court by keeping away from it such testimony that we knew was true; and that we prevented the witness from giving it when he wished to give it; and that they ultimately had to take upon themselves the burden of producing it.

Mr. Hill. — Won't you read his one hundred and seventy-fifth answer on p. 244? That explains it.

Mr. Dickerson.—His testimony is of no consequence to any human being on the face of this earth. The reason that he wrote these letters was that he wanted money; he wanted somebody to pay him money. He states in his testimony that Comfort requested him to write to him if the defendants wanted him to go on the stand, and that he wrote to Mr. Comfort and wrote to Mr. Storrow. Of course that is not true in the sense in which you propose to use it. But anything he can swear to of course is of no sort of consequence. He swore that he wrote his letters because Mr. Comfort told him if he found out anything else to come and tell him. But read them. (For the Kahney story, see our appendix, p. 608.)

These are the two cases of fraud with which we have been charged. I am clearing up our record, and in doing so I am demolishing their testimony.

Now there is one more, and that is the testimony of Zearing. Zearing is a farmer, who claimed that he went into that room, and saw one of those talking machines, I, which is the cuspidor-shaped thing, and that it was standing in the middle of the table, and that Dan went out of the room, and that he stood up alongside of the table and heard that thing talking. Now that is what he swore to exactly, and we said so in our brief; upon which we are charged with the grossest misrepresentation, and your Honor is told that, as a fact, the man really held it close to his ear; and to prove that, the following testimony is cited. I will read it to you (defts, iii, surrbtl, 132): —

"*X Q*. 83. You have told us that at the time you heard Mr. Drawbaugh say 'the steelyards are finished,' the machine was lying on a table near the middle, and you were standing by the table: how near, as far as your recollection serves you, was your ear to the machine?

"*A*. I was close to the table as I could be, if my memory serves me right, and was close to the machine."

"*X Q*. 66. My question refers to the time when you heard the words, 'the steelyards are finished.' Will you please answer it with that understanding?

"*A*. If my memory serves me right, I was standing at the time.

"*X Q*. 67. And where?

"*A*. Beside the table.

"*X Q*. 68. About how near?

"*A*. I was quite close.

"*X Q*. 69. Were the words which you have given us in your examination in chief the first words which you heard through the machine, as you supposed?

"*A*. If I remember right, I think he had a date; that is, the month, and day, and year.

"*X Q*. 70. I understand you to say that while this was going on and you heard these words the machine was lying near the middle of a table in the room which you have spoken of: is that correct?

"*A*. It is, to the best of my recollection."

The COURT. — I have read it. It is not necessary for you to read it.

Mr. DICKERSON. — Thank you. That man's story is that he *stood* close by the table and heard this thing talk when it was lying in the middle of the table. (For Zearing, see app, 626)

These, so far as I know, are the accusations which have been made against us for falsifying testimony, "misrepresenting" it, so as to "*deceive" the Court*. If I have cleared our skirts of this accusation, — I have not looked over the reporter's notes, and I speak of these instances from memory, — if I have cleared our skirts from these accusations, I shall expect to be listened to as if the accusations had never been made.

Now this case is launched upon your Honor with the preliminary claim that their principal witness and inventor is a man of high character, and integrity, of wonderful diffidence and modesty, against whom nothing has been proved by witnesses called to say that he would not be believed under oath, and therefore that he must be believed. An appeal has been made to us, and we have been challenged in the brief and orally, to meet that claim of high character for Drawbaugh. I accept the challenge. I propose to show to your Honor out of this record that Dan Drawbaugh was a PROFESSIONAL IMPOSTOR; that he made his living for years by being a professional impostor, — just as much as a bunco steerer in New York makes his living by being a bunco steerer. *He was a professional impostor. I use those words advisedly.*

About 1870, or earlier, — perhaps earlier, — Dan Drawbaugh began to make what he called an electric clock. Upon that clock he spent hundreds of dollars. Indeed he spent thousands of dollars in time and in money. He worked at it for several years. When this case began, it had been for two or three years in a blaze of glory. He had made, at his own cost, five of these clocks, beginning with a simple clock movement hung up on the wall, and running into and ending with a magnificent, elaborately carved and gilded case, seven feet high or more, two feet and a half or so in width at the base, of black walnut, elegantly finished; which clock was, at the last account, according to the testimony, in the city of New York, and in the possession of one Marcus Marx, — I think that is the name, — one of these parties who is keeping it, I suppose, as a monument in honor of Daniel Drawbaugh. That clock Drawbaugh got advertised in the newspapers all over that part of the country. There were most extravagant eulogies upon it. It was said by Dan's friends that "*perpetual motion*" had been obtained at last. It was on exhibition in the city of Harrisburg by a man who had made a contract to buy it and travel with it on a starring tour throughout the State, and exhibit it to audiences for ten cents apiece, or some such price. And Drawbaugh attended the exhibition in Harrisburg from time to time, and explained the clock. He had a friend, a very intelligent man too, a Mr. Lloyd, a school teacher in Harrisburg,— who had access to the public press, — one of the two principal teachers there. He did not know anything about electric clocks; but inspired by Dan he published one of those articles, in which he called upon the State of Pennsylvania to appropriate money for the purpose of having this wonderful invention put into the State House and into the chambers of the legislature, and the like; *the miracle of the thing consisting in the circumstance that it would run without winding, and would run from an earth battery.* (See complts, iv, 386.)

Of this clock it was said that Drawbaugh was the inventor, — the *inventor of the clock that would run perpetually.* Those articles were published far and wide, and attracted the attention of the editor of the *Baltimore American*, the leading newspaper in Baltimore. It was the famous reputation of Dan's clock that would run without winding that brought to Harrisburg Mr. Matthews. Drawbaugh explained it to him in detail. He took notes of the explanation, and afterwards, when he read that some other impostor in Massachusetts had invented perpetual motion by electricity, *that* led him to the publication of his article on Dan Drawbaugh's clock, for fear that the glory of this great discovery might depart from Pennsylvania, or from the Middle States, and be transferred to the East. So he wrote his article, in which he said that this contrivance, this almost perpetual motion, was not the invention of the man in Massachusetts, but was the invention of Drawbaugh; and gave Drawbaugh a column of the *Baltimore American* — one of the first newspapers in the South — in praise of this wonderful invention.

When Dan Drawbaugh was doing this thing he knew that that was a fraud; he knew that this clock was copied out of an encyclopædia, which he says he had away back in 1867, or about that time, and he names the encyclopædia, and gives the pages. We got that out of him on cross-examination; but some people who had been humbugged by him had found it out themselves. We got the book. It is a very familiar book —Tomlinson's Encyclopædia. It is a book that was published in 1852 and 1854, in two volumes, to illustrate the great Crystal Palace fair.

Mr. Hill. — This has not been opened, and I shall ask to reply. It is of no consequence, however.

Mr. Dickerson. — If it is of no consequence, then you will not want to reply. If it is of any consequence, I am quite willing that you should reply. The more you reply to it the more it will help us. If the Court will indulge you in a reply, it will indulge me by letting you reply, for I would like to hear you all the time.

A clock, as your Honor knows, is kept running by a weight. Take the weight away it will stop. When the weight runs down, it must be wound up. It requires very little power to run a clock. If it were not for the resistance of the air and the friction on the centre of suspension, a pendulum once started would swing forever. The clock weight wound up furnishes the little power that is necessary to keep the pendulum going. In place of that weight, a battery can be used to charge an electro-magnet, and, by attending to the battery once in a while, one can keep the clock going. The difficulty in using a battery, however, is that it never runs two seconds alike. A "*constant battery*" — that is, a battery that will develop a truly constant and uniform force — has been the dream of inventors ever since batteries were first made. If any man could invent a battery that would run uniformly, he would have a great fortune out of it. We have no constant battery. A battery runs with an ever-varying force. Sometimes there is less, sometimes more, according to circumstances; therefore a battery is of no practical use when applied to the running of a clock. A weight does the work exactly and causes the clock to run uniformly; and such a clock will keep uniform time so far as it depends upon the driving power. A clock run by a battery will not keep time. Drawbaugh induced Mr. Shapley to take an interest in this clock, and to build one. He was a clock maker. He testifies that the thing would vary fifteen minutes in a day from day to day. He did not know anything about electricity, and relying on Drawbaugh's representations, he became a victim and built a clock. It would vary fifteen minutes from day to day. Of course it would. It was like Capt. Cuttle's watch, — one of the best things in the world to keep time with; if you set it ahead ten minutes in the morning and twenty minutes at night, there was no better watch in the kingdom.

Now, I am going to show you from Tomlinson's Encyclopædia that Dan Drawbaugh knew all about it when he was doing this fraud and getting money for it. He knew all about the clock, and had it all in this book. Here is an accurate description of it in Tomlinson's Encyclopædia, p. 41, referred to in Drawbaugh's deposition (defts, ii, 968, 970, 976): —

"Mr. Bain, Mr. Appold and others have also produced various forms of electric clocks, in which the current from the voltaic or earth battery is made to supply the place of the spring or weight commonly used as the maintaining power. . . . The *earth battery as usually made* consists of a large plate of zinc, and either a plate of copper or a quantity of coke, buried at a certain distance asunder in damp earth. *The moisture of the earth acts on this voltaic couple as the exciting fluid*, and a feeble but very constant current is produced by this arrangement.

"In these and other ingenious applications of electro-magnetism as a maintaining power to clocks, the *attraction and repulsion* of magnets have been brought to bear directly on the pendulum, the bob of which is a coil of insulated wire, through which the electric fluid is transmitted at intervals. . . .

"On the applying electricity to produce the vibrations of the pendulum the *amount of power must be constantly varying with the variations of the battery, and it is of course impossible to obtain correet chronometrical results under such circumstances.*"

The book describes various kinds of electric clocks run with earth batteries, zinc, copper and carbon plates being put into the earth to make the pendulum swing. Of course all that has to be done is to put a magnet or an armature in connection with the pendulum, and then connect the electro-magnet in an electrical circuit with the battery; and when the pendulum swings one way it cuts the circuit and the current ceases to act; when it swings back the circuit is closed again. The battery is thus made to do the work of the weight. The pendulum makes and breaks the circuit, and the thing is done. The battery in place of the weight, to run the clock The whole thing is described in this book; and the reason why it will not keep time is stated.

Now there is where Drawbaugh got his electric clock, and at the same time that he got it, he learned that it would not keep time. There is where he saw and got his earth batteries, and the alternate attraction and *repulsion* by an electro-magnet. Having got these ideas from this book, what did he do? Here was a man struggling in poverty, according to the answer and the testimony. What did he do? He is a dabbler in just such things, — a fellow who wants to experiment in anything that comes around, rather than do a piece of work in a straightforward way. It suits his taste. He could afford it. He had a good deal of money. He was willing to spend his time and his money in tomfooleries of that kind. What did he do? Why, he goes to work making Bain's electric clocks.

In order to make a clock, he needed to have cog wheels cut. His neighbor and friend, Shapley, a clock maker, had a gear-cutting engine, and he borrowed it and used it; and there were perhaps fifty gear-cutting engines in Harrisburg. Drawbaugh, however, was not satisfied with using Shapley's gear-cutting engine, which he had, or with getting his gears cut for a few cents apiece in any shop, but he went to work to build a gear-cutting engine for himself for the purpose of cutting gears for his electric clock. He never built but five clocks; but, to cut his gears, he built himself, at his own expense, a gear-cutting engine. The fact is published for him by his friend Lloyd that he has made a gear-cutting engine, that cost him only from sixty to seventy dollars, whereas to buy a new one would have cost him some hundreds of dollars. This *pauper*, who did not know where to get bread from, who could not get the money necessary to patent the telephone, was seeking to put this fraud of a clock out on the community, — this clock that will run without winding; and he builds a gear-cutting machine to use in making the machinery of the clock. (Brief, p. 326.)

What next? He said that he wanted to see how this clock would keep time. Thereupon he constructed a transit instrument, to take the time from the sun. This is really laughable. He had some lenses, which had been in a photograph apparatus; and with them he went to work to build a transit; to construct a perfect instrument, capable of sweeping a true meridian plane. It would have cost him a great sum to do it, and if he could have got it done it would have been of no use *to him*. Even if he had had the great transit at Washington, it would have been of no more use to him than a buckwheat cake, in finding out what time it was. But he went to work and built this transit. What to do? Why, to find out how his clocks kept time. There was a great clock in the city of Harrisburg, within sight of him; and he was right alongside of the railroad, where he could obtain government time, even to the second. But he built a transit; and he says that every day for a long time he took a transit observation. He did this every day for a long time, and then every two or three days for a time. This is his testimony: —

"Them observations were continued, to the best of my knowledge, six or eight months, or perhaps one year" (complts, iv, 144).

He was asked: —

"*X Q.* 114. Can you give the name of the formula that it is known by?

"*A.* I cannot; but I can find out."

He was like the boy who was shown the first letter of the alphabet: "What is that, my boy?" "I don't know." "That is A." "Oh! is it? I knew the name, but I had forgotten it." Here was this charlatan, who had first built a gear-cutting engine with which to make gears for his electric clock, then built a transit for the purpose of seeing what time his clock kept, and then, when asked how he did it, how he turned his transit observations into time, he answered that he did not know, but "I can find out." (Brief p. 325.)

Then he went to Mr. Shapley, a watch and clock maker who lived in the village of Mechanicsburg, where Dan lived for a year, — from the first of April, 1876, to the first of April, 1877, — and got him to contract to buy Bain's clock. Shapley then had two thousand dollars of money, which he wanted to invest in something. Drawbaugh having impressed him with the idea that he was a man of profound genius, he was persuaded to enter into a contract, which is in the case, in writing, signed in November, 1876, to go in with him and patent his wonderful invention, the electric clock, — whose great merit was that it would run without winding. Shapley paid him twenty dollars, and then made a clock at his own expense. Shapley did not know anything about electricity, but he did know about clocks. He went to work and made one from Drawbaugh's specification, and set it up; but of course the thing would not run within fifteen minutes of any time. Shapley did not have a transit; he only had true time in his shop derived from Washington. Having no transit, he was not able to make this thing run within fifteen minutes one way or another of the true time. That settled the case with him. He did not want any more electric clock. Dan had stuck him for twenty dollars and the cost of a clock, and that was enough. Shapley was called as a witness. He gives a piece of testimony which is interesting. We also asked Dan about this affair, and if he and Shapley were on good terms. "Well," he says, "I don't think Shapley thinks as much of me as he did at one time." I should think not, after that performance. That was Drawbaugh's opinion. "I don't think Shapley thinks as much of me as he did at one time; by his manner when we meet, I would think he didn't think very much of me" (defts, ii, 1101). After a little experience with Dan, nobody does. One only needs to get close to him, and after that he experiences the feelings of Shapley, — the stronger the closer you get to him.

Then Dan went and talked of this wonderful invention to three other men. This second set were not clock makers, and knew but little about them, and so he interested the Grissingers in his electric clock, and Shettle, who was a relative or connection of his. He went to these people and sold this unpatented *invention* of a clock to them. This was in 1878. They paid him *five hundred dollars in cash for the inchoate right of patenting a clock which would run without winding, by an earth battery;* Dan Drawbaugh all the time having that book alongside of him, and knowing it was a simple fraud.* He worked up this electric clock and sold it to his neighbors, — he knowing all about it, they knowing nothing, — and he swindled them out of that five hunderd dollars. But what did he do with the money? Did he use it to apply for a patent on his telephone? We have been told of his distress of mind, of his perpetual agony, of his days and nights occupied in wandering about with down-bowed head, lamenting the hard fate which prevented his getting thirty dollars with which to patent his wonderful invention. Yet during all this time he was building these clocks at an expense of hundreds of dollars, and spending his time in squinting through that tube which he called a transit. He might just as well have squinted through that tin cup, for all the use it was to him. But he got this five hundred dollars. What did he do with it? *He paid off a mortgage.* That was the second time that he did that with money. He paid off a mortgage of $237 on a house which he had bought in 1876 and owned in Mechanicsburg. He paid off that mortgage of $237 with the money that he had made by swindling those people in selling them *as his invention* a clock that would run by an earth battery, and would not need winding.

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* It was the prospect of controlling by patent a clock which would go without winding that attracted them. Shettle testified that there had never been any talk about patenting a telephone but (defts, i, 222): —

"*Q.* 56. Am I to understand that it was your judgment and belief that there was more money in a clock that would run without winding up, than in a machine by which a man could talk from one place to another?

"*A.* Yes, sir; I thought there was more money in the clock."

"*Ans.* 58. Persons all over the neighborhood were talking about the clock, thinking that it was a great invention, and that it would be worth a large amount of money."

"*X Ans.* 98. No, sir; the principle was to be controlled by a battery from the earth by itself."

"*X Ans.* 99. All those that were to be magnetic clocks were to run without springs or weights."

Is not that man an impostor? If he had never seen this encyclopædia,—if he did not know anything about it,—if he had gone into that piece of tomfoolery in his ignorance, I would have nothing to say about it. He is an ignorant man,— very ignorant. He is a good mechanic, — a good workman with his hands, but profoundly ignorant of principles. But he knew about this; he admitted on the witness stand that he knew about it. He gave us a reference to the book. He told us from where he got it, and when he got it; and that is what he did with that knowledge. (Defts, ii, 968, 970, 976.)

Well, he went on a little further. He carried that farce on a little further, and finally got a patent on his electric clock; and what do you think that patent was? He patented, as a "*new article of manufacture*," a galvanic battery for electrical clocks, with the two elements strapped together instead of being laid side by side without fastening, which was old, so that both can be put into the ground at once. He claimed that as "a new article of manufacture," — the two plates of a battery strapped together. He got a patent for that. That is what his invention was (defts, ii, 969–972).

The Court. — When was the patent applied for?

Mr. Dickerson. — In the spring of 1878. This is how it is described in the O. G. claim: —

Daniel Drawbaugh, 211,322, dated Jan. 14, 1879, *for earth batteries for electric clocks.*

I. "As a *new article of manufacture*, an earth battery or couple, composed of a copper and a zinc plate, both protected fixedly by enveloping bodies of coke and felt, respectively, or of equivalent substances applied by adhesives to said plates, *ready made for use*, in the manner and for the purpose substantially as set forth."

Mr. Hill. — The ground-battery patent was applied for by the Clock Company. It is not a patent on the clock at all.

Mr. Dickerson. — This company paid him $500, and then applied for a patent. That patent was not for the clock which he had sold the company, it was not for that that he applied for a patent in 1878; but his application was for a patent for a new article of manufacture, namely, two plates of a battery strapped together, — in place of being put into the ground, first one and then the other.

Mr. Hill. — That was an application for a ground-battery. He also applied for a patent for improvements in electrical clocks, and that application *is still pending. His assignees have not taken out that patent.*

Mr. Dickerson. — I should think not. Your Honor knows very well that any one can get forty patents on an electrical clock or anything else. He might put the battery crosswise or put the magnet upside-down, — this way or that way, or any other way, — and get a patent on it; but it was not the thing that he was telling the public about. He was telling the public that he had *invented* a clock which would *run without winding, by an earth battery*. That was it. That was what made them stare. Your Honor will remember that description of a friend of his in the Mechanicsburg *Journal* who published how his words rolled out, and how he talked of science in a way that would astonish a man. That reminded me of Goldsmith's description: —

> "While words of learned length and thund'ring sound
> Amazed the gazing rustics ranged around;
> And still they gazed, and still the wonder grew
> That one small head could carry all he knew."

Drawbaugh was there carrying on this game of making the rustics around him gape and stare at him because he had invented a perpetual-motion clock, and was squinting through a brass tube in front of his place, and talking gibberish.

But one thing more. He made, in consequence of this electric clock,—or whatever electrical apparatus he had,—he made a machine to wind the thread around the wires for insulation. He made a machine to do that. This wonderful inventor, whose whole heart and soul were in this telephone, was making a machine to wind thread on the wires. Now this insulated wire consists of simply thread and copper. He had got to buy the copper and the thread. He could buy insulated wire, for it is an article of manufacture, and is kept in all places where electrical supplies are kept; he could buy the insulated wire, I have no doubt, for as little as he would have to pay for the thread and the copper; because it is made by wholesale, by the ton, and it costs very little to wind the thread on the wire. And yet he must needs make a winding engine to wind the thread on the outside of his copper wire, at a cost far greater than all the wire he ever needed, and then have these country bumpkins stare at that, and tell about it in the record. This inventor, whose whole heart and soul were bent upon patenting the greatest invention of modern times, set himself to work to make a little winding engine in order to wind the thread upon the wire, when he could have gone into any supply store in Harrisburg, and for as little money as it cost him to buy the copper and thread separately, could buy the complete thing. But that would not have been occupying his time in making these jimcracks and amusing himself with imitating well-known machines.

That is what he did with the electrical clock. The end of it, as I am told, — and I hope I shall not offend anybody by saying it, — that that electrical clock belonging to Mr. Marcus Marx is now at the Electrical Exposition at Philadelphia. That clock, with its broad base, its carved front and entablature, and magnificent woodwork, is there on exhibition as "*Drawbaugh's Electrical Clock.*"

We will go a little further yet. What else was he doing? I will take you inside of that shop now. I agree with Mr. Edmunds, who said yesterday that the right way to look at this thing is as it then was, Let us look at it from that end of the line, and as it was at that time. in the environment in which it stood. That is honest and fair. Take an inside view of that shop. What was there? This Dan Drawbaugh, having this wonderful invention of the telephone on the brain, as they say, was making another instrument, which is called an electric key. That is the thing we had on the table, which you could put your finger on and snap, and make it ring a bell. He was making that electric key. That thing is very old. It is proved to be so. It is a perfectly familiar fact in electricity (complts, ii, 1381-2; brief, p. 322). It is here called the electric key. Move a permanent magnet in front of an electro-magnet, and that motion generates a current of electricity. It is a very old invention; and Drawbaugh was making it in his place. If one went in there he would see that. It was connected with wires and with bells. Dan was going to make that thing ring the bells in a hotel. But this was done, as you perceive, merely to save the necessity of having a battery in the cellar,—just as the electric clock would save the necessity of a man winding it up once in a while; but he would have to go and look after the battery occasionally. That is all. He had this all rigged up there, with the bells on it. He has described it in his deposition, and described it very well; and he has told us that he was going to make this electric key ring bells in different parts of the hotel — whichever bell he pleased. He was asked to describe that contrivance. That was a pretty dry problem for him. He scratched his head over it, and then said, "I can't hardly give you the right language; I know that I had worked them in that way; I had a mechanism, and I know I rung them, and it is so long ago I almost forget it." (Defts, ii, 982, x-ans. 1039.)

He said he had it in his head, but he could not describe it (defts, ii, 982, x-ans. 1039; 985, x-ans. 1050). No doubt he had it in his head, because it is a thing that anybody, if he was going to put several bells on one line, would like to have it in his head. Any one would like to know how to work that out. We asked him the question how it could be done, but he could not tell us. He claimed that he had done that thing there. That thing, however, looks very much like **C**. It is a big horseshoe magnet hung upon a trunnion, and the operator takes hold of one end of it and wabbles it. That thing looks just like **C** when it has its magnet on it. A countryman coming in there and seeing that, and then going away, and five or ten years afterwards coming as a witness, and being asked to tell what he saw, he would not know whether it was **C** or the electric key. That is what he had there.

What else did he have in that shop? He had in that shop a letter or alphabet telegraph, in which is touched a key like the key on a piano or on a writing machine, and each key which is touched represents a letter, and the impulse goes on the line and a letter is shown at the other end in a machine there. Each one of these keys had a little electro-magnet of its own. If he wanted to send A, he pressed down A, and that wabbled a magnet, and that sent a current on the wire to its end. Well, that is also a very old device, — very old. It came in thirty years ago sure. It is all proved in this case (complts, ii, 1382). All of these things that I am now telling you about are proved in this case. They were all old devices. They are shown and described in any handbook of telegraphy. We cannot say that he saw them in any particular handbook of telegraphy, but he might see them there. A man who did not know that those things were old, did not know anything about electricity. He not only did not have any knowledge of the current literature on the subject, but he was ignorant of principles, and therefore he had no capacity to make any such invention as this. But he says he invented it (defts, ii, 990).

He had this A B C telegraph in that place, and he told people that it would supersede the telegraph. He told them that the electric key would supersede the telegraph. He acted on that idea, and actually made experiments to see whether it would not, — all of which I will come to in due time. That is what he had in his shop. He had in his shop some other jiggermarigs, which I do not recall at this moment; but these were electrical things that were there, which he was exhibiting to people. They would come in, and he would say, "Here, do you see that?" Then he would wabble his magnet and the bells would ring. "Do you see this?" He would put his finger on a letter of the alphabet, and the letter A would tumble out yonder. He would spell out words with it. In place of telegraphing in such a way that one would have to learn the signals, as the Morse instrument requires, he claimed that he had a thing that he could spell the words out with, — a kind of talking machine. Press the keys at one end of it and the letters come out at the other and spell out the words. He was doing all these things there. He was spending hundreds of dollars in money and time, — as much money as would patent hundreds of telephones. He was working at these things for years. He had expensive apparatus, — very expensive, — a spelling-out telegraph is an expensive apparatus. He had to have the twenty-six letters worked by separate electro-magnets or by separate armatures, and have all those circuits completed; and it is a very expensive apparatus. He worked at this thing day after day, spending his time and his money upon it. He showed it to visitors, and now they come and say it was a "talking machine." We examined him about it, and his vanity was so tickled at the opportunity of having his immense learning exhibited that he became very effusive, and told all about the things on his cross-examination, not seeing where he was landing his case. My friend Mr. Smith led him along as softly as possible, and he told us all about these things, — described them all in very good language. He described how these electric toys were made, and how they operated, and how he made them all. There they are. On page 340 of our brief is a list of things which he had in his shop and pretends to have invented. Apart from the telephone in dispute, all were well known years before he touched them.

Now, may it please your Honor, all that was done by a man who all this time, *as they now say*, was trying to get $15 or $30 for the purpose of patenting a telephone which he claimed to have invented. In all the time that he was imposing on that community by these devices and contrivances, — by this brass tube, or whatever it was that he had to look at the sun through, — and by all these sorts of things, and while he was getting himself notorious in newspapers, and looked upon as a man of immense capacity in that community, he also claims to have invented a lot of other things, one of which was a modification of an old molasses spigot, in which he got his neighbors interested, and lost an immense amount of money for them. Now it is because of all these things that I say he was a "professional impostor"; that he was carrying it on as a business regularly, and that he made a great deal of money out of it. He got more money by putting out insignificant things upon his neighbors, and getting their money for them, than he could have earned as a mechanic if he had worked every day from morning to night at full wages. He got more than $10,000 in cash for such things as he had contrived. I will give you an illustration: —

One of his companies failed in trying to manufacture some of his things. They were good for nothing, and he could not make them good for anything. Still, the company had not lost faith in him, and they were looking about for something else from him that they might take up and make something out of, as they probably hoped. Mr. Dorsheimer happened to come down from Buffalo, and the people who were Dan's partners, — respectable people there, for Mr. Dorsheimer associated with them, — were told by Mr. Dorsheimer that in Buffalo there was a concern making money out of manufacturing wood screws. Your Honor may know that this wood-screw business has been a very profitable and extensive business, and that it is founded upon some very valuable patents. The Providence concern, which has been going for thirty years, has made a great deal of money out of wood screws. There have been a great many patents taken out upon machinery for making wood screws, and different companies around the country have been manufacturing them. Mr. Dorsheimer came down there and said, "Up in Buffalo there is money being made on wood screws." Dan Drawbaugh spoke up at once and said, "I can invent a machine for making wood screws." He could do anything, — it did not make any difference what: "I can *invent* a machine for making wood screws."

He had his company about him there, and so there was a meeting of the whole of them called, — a meeting of the people who had put thirty thousand dollars into the business for the purpose of carrying his inventions along. He said to them, "I can *invent* a machine for making wood screws." Thereupon, on motion of Rupp, seconded by Daniel Drawbaugh (for this is upon the minutes), it was resolved that Daniel Drawbaugh be requested to invent a machine for making screws for the use of this company. "For the use of this company." I notice in Mr. Hill's brief that he quotes the words "for the use of this company," and puts them in italics, and asks the question, "What has that to do with the telephone?" One of the questions asked Rupp was, "What did you mean by that?" "Why, to go into the manufacture of wood screws." That is the character of the man. He would invent a machine for wood screws, or a molasses spigot, or anything wanted, if you only told him what it was (brief, pp. 249–254).

This man had a most wonderful persuasive power with these people. He made them believe in him. If he told them that he would do anything, they would believe it; because he was a man of such excessive modesty that what he *did not claim, proved what he could do* (brief, pp. 249–253, 378).

But we go a little further. When he appears on this stage, and in this case, and attempts to carry out his impositions in this court, his talents develop wonderfully. He becomes a magnificent performer on that kind of instrument, when this court is the objective point. And that brings me to a very important story in this case, touching a great many witnesses, and a big part of this history. I will tell that story circumstantially, in order that I may tell it with accuracy.

A man named Thomas Draper had formerly lived up in that neighborhood and owned real estate there. He had been, I believe, a land surveyor. He had moved from there to Dover, Delaware, where he was engaged in manufacturing fertilizers, or something of that sort. He still kept his real estate (which was in farms) up in that neighborhood, and had an interest all the time near Harrisburg. He was up there in the winter of 1881, when this testimony was being taken, and was talking to people about this controversy which was raging. It raged in hotels, in blacksmith shops, in groceries, in public places, and in private houses, — the whole country was raging over this wonderful lawsuit, which was to let a flood of gold down into that little hamlet, and make the town thereafter richer than the "dreams of avarice." Every village gossip was engaged with it. It was talked all over. Mr. Draper went up there, and he got to talking about it. He said, "Why, I know something about this business." Perhaps he stated what he knew. But it came to our ears that he knew something about it. Thereupon Mr. Storrow sent down one of his agents to see Mr. Thomas Draper at his home, in Dover, Delaware. That was in January, 1882. Mr. Draper told that man that he had seen a talking machine of Drawbaugh's in 1873. That was a very interesting fact. It was the first piece of testimony that we came across that *apparently* had any bottom in it. Here was a man who was, to a certain extent, engaged in business there, — a fairly intelligent man, — and we accidentally heard that he had been up there, and had gone home, and that he had these impressions; and so we followed that right up. We wanted to know just what he knew about it. He said, "Yes, I remember about it; it was in 1873." That was very startling. But he said to our agent that Kissinger knew exactly, and we had better go and see him, — *that Kissinger knew exactly.*

Now Kissinger was the tenant on Draper's farm at a place called Marysville, and had become a tenant on that farm in 1874. Draper was mistaken about the time that this man had become his tenant. He had become his tenant in 1874, not in 1873. He told us to go and see him; that he knew all about it. This man Kissinger had moved away from that country, and was living in Maryland. Our agent went out from the presence of Draper directly to Kissinger, according to Draper's suggestion. Kissinger said, "Yes; I know all about that. The time that this ram was put in on my farm was 1878. I know all about it. I *think* it was in 1878." He had no reasonable doubt about it. That was a great relief to us, as your Honor may suppose; for if we had turned up a man like Draper, who knew of this thing in 1873, it was rather startling to us. For your Honor must perceive now, that, during all this time, this $5,000,000 company was selling its chromos around Wall Street, and it was not a very difficult thing to own it, if they had anything to sell. Our people, of course, would not have had much difficulty in owning the menagerie, if there was anything in it worth owning. It was very important to us to know whether there was anything worth owning, and if so what the thing was. It was important for us to know if there was really any bottom to the defendants' case. If any witness turned up who really knew anything of any value, we wanted to know all about it. It was vital to us to know. So we went to Kissinger, and he said, "Why, it was in 1878." That was a great relief. There was no such man as Draper any longer. He was not in the problem at all.

But, after our visit, Draper wrote a letter up to Drawbaugh, which letter has been read to you, in which he says that he does not want to see Dan lose his rights; but he does not want to become a witness unless necessary: and he tells Drawbaugh about the interview of our agent with him. That letter was dated somewhere the last of January, 1882, after our agent's visit. *The examination was going on then, and Dan Drawbaugh was on the stand.*

Just there comes in one of those lovely little incidents which show that the good God does not leave truth always at the mercy of knaves. A question had been raised about Drawbaugh's selling rams. We had been probing into Drawbaugh's business all around. This "*miserable poverty*" pretence was vital to their case; we were trying to get at the bottom of that, and we were probing into all his business matters. Among other things, in the course of his business, he was a manufacturer of hydraulic rams. We were getting at the ram business. We asked him whether he had not got accounts and bills about his rams that he sold, and the pipes, etc. He said that he had. We told him to fetch them along; that we wanted to see all. We were of course feeling in the dark. Drawbaugh came up and put into the case a bill for pipes bought to be used on a ram in Marysville. *That is the Kissinger ram. That bill was from the Philadelphia manufacturers of pipes, and was dated July*, 1878. *Drawbaugh put it into the case as exhibiting his ram business* (defts, ii, 1055, x 1427; p. 1068, x 12, 88). The value of that bill, of course, was not at all perceived by him or by us at the moment. It went in and became an exhibit. Drawbaugh had bought for Kissinger's ram a lot of iron pipes from the manufacturers in Philadelphia in July, 1878.

Mr. Draper wrote to Drawbaugh, and Drawbaugh received his letter, and then this is what happened: A recess was taken in the examination from the last day of January until the 13th of February, — a couple of weeks. Dan Drawbaugh and his partner, Jacobs, immediately started down to see Mr. Draper, who was a very important witness for them. Mr. Draper told them, probably, the same story that he had told us, and told them that Kissinger, his tenant, knew all about it. Thereupon they followed on our tracks, and went right down to see Kissinger in Maryland. Kissinger was an old friend of Drawbaugh's. All his sympathies were with him. He had lived as his neighbor, in Milltown Village, before he moved on to the Marysville farm, and was most kindly disposed towards him. So Drawbaugh and his partner, Jacobs, went down to see Kissinger, under the indication of Draper that Kissinger was the person who could tell them exactly what the fact was. What happened there? Kissinger told them that he believed that it was in 1878. Did he have any books or papers, they asked him. He said he didn't know, but would hunt. *He told the partners so, — Drawbaugh and Jacobs,* — two of the partners in this quartette. Kissinger says he told them so, and that he would look up his books and papers and let them know in the morning (complts, i, 559–60). It seems that the train that they were to go by passed Kissinger's place, and that these people had to get into the train some little distance off, and that they expected to go past Kissinger's place perhaps without stopping, or at any rate without a chance to talk with Kissinger. Thereupon Kissinger wrote upon a piece of paper the result of his examination, and took it to the train in the morning; not expecting to have a chance to talk to them, but would give them the information in writing. The train, however, stopped long enough for Drawbaugh to get out, and there Kissinger gave him the memorandum and told him about it. He told him to go to the railroad office at Marysville, *and there he would find the time when the pipes for that ram came.* They came from Philadelphia, and there was a bill of lading at the station. By that he could find it all out, and it was 1878. This visit was Feb. 7, 1882 (complts, i, 586).

I will supplement that by this statement: *Dan Drawbaugh made that ram, sold that ram, and put it up.* HE MADE IT, AND SOLD IT, AND PUT IT UP. He knew just when it was made, sold and put up. He knew that himself. He had done it. But they went to Kissinger, and Kissinger said it was in 1878. You observe that Draper had said in his letter to us that it was in 1873. He afterwards said that he thought it was 1874. We will get his history afterwards. It was pretty good luck to get a man like Draper to go back to 1873 with the telephone.

How that ram came to be associated with the telephone was this: when Draper agreed to buy the ram for his tenant, Kissinger and Draper went over to Dan Drawbaugh's shop to order the ram; and Draper was there that once, and never again. Therefore, whatever he did see he saw then, and not at another time. If it was in 1873, it was a very important fact for the partners. If it was in 1877, it was equally important to us, because Draper describes just what he saw. That it was in 1877 when Draper went there is what we show exactly; and Draper proves our case *exactly.* It was therefore vital to the case of the partners to support Draper, who said the visit was in 1874. Draper said that the ram was put in the year after it was ordered, not later; and so the date when it was put in became important, and they undertook to swear the ram in in 1876. That was their issue,— in 1875, or 1876, or some time before the Bell patent, it did not make any difference just when. They were not particular about the time, so long as it was before our dates. Dan Drawbaugh knew the time himself. He had made the ram. He had put it in. He had made out his bill for it. *That bill is in his hands to-day, and we have not been able to get it out of his hands* (defts, iii, 930, ans. 27). What did they do? The partners knew the truth so well that they did not even go to the railroad office where Kissinger had sent them, but they went on to examine Drawbaugh, and DID NOT ASK HIM FOR THE DATE. When they resumed the examination of Dan, beginning on the 13th of February, they did so with the knowledge that that ram question was the point that was coming on next in Draper's testimony, and with the knowledge that Dan knew the truth, for *he did it, and no one else*, and they never said "ram" once to him.

They then put Thomas Draper on the stand. Thomas Draper told his story, and he fixed the date of Kissinger's tenancy by the lease. Kissinger went there in 1874 and stayed till 1880; and Draper said that the next year after he went there he ordered the ram, which was put in by Kissinger. He said that it was put in not later than the next year after it was ordered. Some time was occupied in boring wooden pipes. Drawbaugh and his partners sat there and heard Draper tell that story, *when they knew what the fact was.* He made the ram, and put it in with his own hands. The coming issue was known to him before his testimony was closed; but he kept on the weather side of the law, as, you will find from his examination, he tried to do always. He is a shrewd man, and he keeps on the weather side of the law just as far as he can, and does not do any more swearing than he thinks is absolutely necessary for his case. He does not waste any swearing. Some of his people are wasteful liars. He is not; he keeps up to the edge all the time, but don't waste any swearing; he did not waste any on that ram. He is very shrewd. The moment that question came out, Drawbaugh perceived that the date when that ram was put in was a vital question; because if they could have established by one witness of character, and under such circumstances as that, the existence of those things in 1874, why they had given a foundation for Drawbaugh's whole story. It would not have proved that he had got a perfected invention, but it would have given a *foundation* for his story. It was worth immense things to them. They lavished money and time upon that issue until they swore, as appears by this record, — I do not know how many witnesses, — seventy-five to one hundred. What did we do? We called the Kissingers; we produced the railroad receipts; we showed that the ram was put in in 1878; we showed that Drawbaugh put it in himself; we produced the man who went for him in the wagon, and who took him over there to put it in. We proved it all as well as it could be proved. Then the partners attacked it. Now, sir, Dan Drawbaugh got thirty witnesses to go upon that stand and swear that they saw that ram in that place before 1878; that they saw it themselves, with their own eyes, or heard it beat with their own ears, or drank with their own mouths the water that came out of the spout that it supplied; and of those thirty witnesses there were a great many — more than ten — who never had been there after 1877, and therefore, it was said, could not have been mistaken. And among that number were as honest men as ever were witnesses in this case or in any other. Dan Drawbaugh himself, knowing the fact, having made the ram, sold it and put it in, and having the entry of it in his books, procured thirty men to come and swear that it was put in there before 1877, and that they had seen it, when he himself would not say so, and, of course, they never asked him. It was a vital issue, and they did not call him.

The COURT. —Where is the place in the record in which reference is made to the bill for the material used?

Mr. STORROW. — At p. 1068 of defendants' record, Vol. II., and complts, i, 554.

It was put in evidence in February, 1882. This is the bill: —

"Philadelphia, 7, 1, 1878, Mr. Daniel Drawbaugh, Eberly's Mills, Cumb. Co. Pa. Bought of Morris, Tasker & Co., Limited.
Mkd Marysville, Pa.

2 Bdles ½ Pipe 200,		.07	14.00	
165 lbs.	55 per cent & 2 per cent,		7.82	6.18"

P. R. R.

The COURT. — How is that connected with Kissinger?

Mr. DICKERSON. — I will show your Honor. The second of these accounts is the one: —

"Philadelphia, 7, 1, 1878, Mr. Daniel Drawbaugh, Eberly's Mills, Cumb. Co., Pa. Bought of Morris, Tasker & Co., Limited. Mkd. *Marysville*, Pa." — so many pounds of pipe — so much money.

You will notice that that second one is marked "*Marysville.*"

Mr. HILL. — *There is no doubt but that it does relate to that particular ram.*

Mr. DICKERSON. — I should say so!

Mr. HILL. — The only question is whether it relates to the original putting in of the ram or to the repairing of the ram.

Mr. DICKERSON. — Oh, ho! We are not commenting upon that just now. I want to get all the facts in first. I do not propose to be taken out of my order by any admissions.

The COURT. — Is there any issue about that in this case?

Mr. DICKERSON. — No, sir; *there is no such issue. There is not a witness who has said that there were two sets of pipes put in there, or that the ram was put in there twice.* There is no witness on the record who has offered to state that. That is a clear fabrication or suggestion in this brief. They have got a few of their witnesses to say that they *heard it said that there had been a set of pipes taken out and others put in.* That is about all that these witnesses attempt to say. They merely say that they have heard that the original set of pipes has been taken out and a new set put in.

Mr. HILL. — That is discussed in the appendix to our brief; and I do not want to argue the question.

The COURT. — I did not think that it had been discussed.

Mr. DICKERSON. — It was one of the best things in the world for them not to discuss.

Mr. HILL. — We did not want to take up the time with it.

Mr. DICKERSON. — I know you did not; and you did not discuss a great many other things that belong to this case, but occupied your time in abusing us. If you had only discussed your case, you would have saved me the trouble of doing it.

Now let me state that issue again. Let us have no mistake.

This suggestion is made in the brief for the first time, that possibly the explanation of this contradiction is that this ram had been put in twice, and that the pipes have been put in twice; or that the ram was put in first, and that then it was taken out again, and carted back to Drawbaugh, and that he did something to it, and then it was carted back and put in a second time; or that, perhaps, the first set of pipes was dug up and that a second set of pipes was put in the second time. But all that is nothing but the suggestion of the partners. There is not a witness in the case who swears to any such thing. Dan Drawbaugh knows whether it happened or not; because, if it did happen, he did it. Mr. Draper knows whether it happened or not; because, if it was done, he paid for it. It was his ram; he bought it; he paid for it. It was on his farm. I heard somebody tell your Honor yesterday that here was Mr. Kissinger, a very poor man, who had to look out for a lot of cheap pipes before he could have them put in. Why, sir, he was not paying for them. They were paid for by his landlord, Draper. The landlord paid for them, not the tenant. Whatever the tenant did, he got credit for doing on his rent account. They were paid for by the landlord. Now Dan Drawbaugh knows whether this is true or not. Thomas Draper knows whether it is true or not. Thomas Draper says to us, "*I am satisfied that the ram was put in in* 1878."

Mr. Hill.— And he says, in the same breath, that he is satisfied that the visit to order it was in 1874, just as he said originally.

Mr. Dickerson. — You will hear a good deal from me if you don't keep quiet, and it will be bad enough for you anyhow when I am done. I will give you the testimony before I get through, but I don't want to do it in advance. One issue was as to when Mr. Draper saw Dan's talking machine. He says that he saw it when he went to Drawbaugh's shop to order the ram, which, *he says*, was in 1874. He also says that the ram was put in not later than the next year. Then they undertook to support that latter statement substantially; they undertook to prove that the ram was put in in 1875-6. They made an independent issue on that. They proved that better than any fact is attempted to be proved in regard to the talking telephone. They prove it by thirty witnesses who saw it, and could not be mistaken. It is better proved than anything about that telephone. It is a case which is well for the other side not to discuss. It ended by Draper's saying, "I am now satisfied that it was not put in until 1878." That is the testimony of their principal witness, and of the owner of this property on which the ram was put. Then Drawbaugh's partner stands up and tells your Honor, "Oh, yes! but Draper, while he gives up the fact that the ram was put in there in 1878, yet we have thirty witnesses to prove that it was put there in 1876; and he says that he ordered it in 1874."

That is a different question.

Mr. HILL. — It was a different question; there is no doubt about that.

Mr. DICKERSON. — I will not follow it up now by reading the testimony. Draper said at first that he ordered it in 1874, and the way he knew it was by the lease, and by the fact that he was going to put a ram in there for his tenant, but which ram was not put in until the next year. It was ordered in 1874, and put in in 1875. That was the issue. It was necessary to prove by Draper that it was put in there in 1875 or 1876.

The COURT. — Was the bill of Drawbaugh's for putting it in produced?

Mr. DICKERSON. — No, sir; the other side have got it; and it was never produced.

Mr. HILL. —The bill was sent for collection in 1877.

Mr. DICKERSON. — He says that the bill was sent for collection in 1877. *It was handed back to Drawbaugh, but Drawbaugh does not produce it.* A witness first said that he had that bill in 1877, and handed it back to Drawbaugh; but he has corrected his dates for us (defts, iii, 930; complts, iii, 2331). *But they do not produce that bill. Drawbaugh put the ram in.* He *made it. He sold it and put it in, and made a bill for it.* That bill he has got. It is in his desk. Then his partner stands up here and tells your Honor that the bill was made in *1877; but where is the bill?* This issue, as you see, is a very heavy issue. It is as big an issue as there is in this case. It is an enormous issue. Drawbaugh, knowing all the facts, deliberately got thirty men to swear falsely, of whom half a dozen or more came back to the stand to correct their testimony, and showed how they were mistaken. They were highly respectable people. That date is better proved than the talking machine is proved. It is proved by witnesses who associate in their minds certain events, about which there is no mistake, and which, by logical connection, lead them as to the supposed date. This is what then happened: When this issue was made, it did not occur to these sagacious gentlemen to say, "Oh, yes! Draper is mistaken; he ordered the ram in 1874; but it was not put in until 1878. Four years elapsed between the two events. He is simply mistaken in saying that it was put in the next year." It did not occur to the sagacious gentlemen in this quartette who were working up this case to take that view. We were afraid they would. It occurred to them to take the other view. They decided to support Draper by proving that it was done in 1876. They could have taken either view equally well. They called their thirty witnesses to sustain him. If anything is proved by human testimony, it is that that ram was put in there in 1875 or 1876; and the fact is sworn to by an unlimited number of persons who went there and saw it, and could not be mistaken about it. They support Draper by a great mass of testimony. Then presently the whole fabrication broke down, and was crushed. Draper came to the stand and said that he must have been mistaken, that "it was not put there, as I said, in 1875 or 1876; it was not put there until 1878." Draper's wife was called. Draper's daughter was called. There were the men and the women who had lived in the house, — Kissinger and his family, and Draper's agent, who attended to the business for him; and all these people were called as witnesses; and by them the date was fixed beyond the possibility of a doubt. Their evidence settled that it was put in there in 1878; and Draper swore that it was so. Then Draper said, "True it is that that was not put in there until 1878, but, all the same, I had that conversation in 1874." That is another question. I am not talking about that. What I am showing is that Dan Drawbaugh tried to establish by the testimony of thirty witnesses what is a falsehood, *and what he knew to be such*, to wit, the date when the ram was put in; because he himself did that thing which he was calling witnesses to prove was done, and when he had the bills in his pocket, and knew all about it, and when he went to those witnesses and got them to commit that false swearing, — I do not say perjury as to all, — for he got half a dozen of them, as respectable men as there are in that neighborhood, to do it, who afterwards came back to correct their testimony.

Among other things that happened, the ram was walled up. It has to be walled up. A ram is buried in the ground, to be below the frost. It is put in a well, and the sides walled up by masonry. Then, at any time when they want to take the ram out, they just uncouple it and lift it out. It is merely a pit in which the ram is, covered with a board cover; and in the country they put corn husks or what not on it to keep it warm. The mason who stoned the ram up was produced, and he produced his books, with the record of the day when, and the amount of money for which, he did that work; he testified, "I stoned that ram up, and here are my books; the entry is, 'George Kissinger, 1878, Nov. 6, half day at ram,' and I was paid by Kissinger, and so on" — here it is. The next-door neighbor, a very respectable man, who was called yesterday by Dan's partner a very old and decrepit man, was one of their strongest witnesses; because he is a man of character, a man who would be believed anywhere in that community, and he swore that he saw that ram in 1876, — I think it was 1876; and among other things which he has told us was that he saw Wagner, the stonemason, walling it up.

Mr. Hill. — Will you please refer to the testimony where he says anything of that kind? I think you don't know very much about the testimony that you are commenting upon.

Mr. Dickerson. — Maybe I don't; but if I do not, it is because of my unfortunate stupidity. I have worked hard enough.

I said that this witness, Mr. Cowens, said that he saw the stonemason walling it up, and I am told that that is not true, and that I don't know anything about the testimony.

Mr. Hill. — You said that he said *he saw him walling it up in 1876*. That is what I said.

Mr. Dickerson. — Now let me read the testimony.

Mr. Hill. — If I am mistaken, I want to be corrected.

Mr. Dickerson. — No, you don't want to be corrected. In that deposition he, the friend and next-door neighbor, testified as follows (complts, iii, 2148): —

"*Q.* 3. . . . *The first time* that you ever saw that ram, was anybody doing any work about it; and if so, who, and what was he doing?

"*A.* MR. JESSE WAGNER WAS WALLING UP THE PIT WHERE IT SET IN, WHEN I FIRST SAW IT."

Now, for a man ignorant of the testimony, as I am, that is a pretty good hit. And for a man who took the testimony and examined the witness to stand up and tell me I lied —

Mr. HILL. — I didn't say you lied. I only asked you to show me the testimony.

Mr. DICKERSON. — I have not got the reporter's notes by me, and I am going to stick to my memory upon it. I noticed that Mr. Hill said to your Honor yesterday that Mr. Cowens had said that Wagner *told him that he walled it up, — told him — not that he saw Wagner do it, but Wagner told him.* I had it in my mind then, and when I went home I looked at it, for I knew it was not so; I knew Cowens was the man who fixed the time by the circumstance that he *saw Wagner, the mason, walling it up.* Wagner swears "it was walled up in November, 1878, Nov. 6; here are my books of account." Thereupon Mr. Cowens says, "If that is so, — and I believe those books, — if that is so, then my association is mistaken."

Now, when I am on Mr. Cowens's testimony, I will give you the history of that, because it is an instructive illustration of how the human mind is deluded by false associations. Here is the case of a man who, in 1875, was going to put up an aqueduct on his place. Cowens wanted to lead water from a spring to his house, and he put in an aqueduct, — square pipes made of four boards nailed together and buried in the ground. When he came to think about the time that his neighbor was putting in his ram, he thought it was the time when he was putting in that aqueduct, and that then he went over for the purpose of seeing what his neighbor was doing, in order to get the benefit of his experience, as they were both engaged in the same kind of business, — putting in an aqueduct. He went over there, and he saw pipes being got ready for that ram. That is a first-rate association, — and his motive for going there was the true one.

Now what was the fact? Roots of trees had grown into Cowens's square box, and filled it up, and in 1878 it had become choked up and worthless. He then had to do something to repair that aqueduct; and *then* he heard that his neighbor had been boring logs for an aqueduct; and *then* he went to see about it: it was the second time that he was attending to his own aqueduct and not the first time. Yet his mind was very certain that it was the first time. There was an association at each time with a similar event; but the difference was simply one of two years in time. Of one fact, however, he was sure: "I know that I saw Wagner walling it up when it was first put in." Of course, if that was so, then he knows it was the second time and not the first time he worked on his own pipes that he went there. And that was this *so-called* miserable, decrepit old man, Mr. Cowens, whom they described to you yesterday as having been led by us into taking back what was true in consequence of our telling him that the mason had made a *misrepresentation*, and he yielded to that representation, which of itself was false.

Now, sir, let us have no doubt, because this I consider immensely important; for, if the question to be proved in this case was dependent upon the fact that that ram had been put in in 1876, in place of 1878, it has been proved better than anything has been proved about talking machines; and it has been proved by the men who procured the testimony, who knew it was false when they procured it. I am not now troubling myself about the value of the fact; I am only concerned about the value of the kind of testimony these people can get and put into this record, about anything they choose to turn their attention to.

Now, sir, in connection with that affair, there is a man named Eppler, who was appointed the agent of Mr. Draper in the spring of 1877 by a power of attorney, which is in evidence. Up to that time Eppler had been engaged on the railroad. He then became a storekeeper in Marysville; quit his outdoor business and came into town and had a shoe store. Mr. Draper appointed him his agent in the spring of 1877, before this ram was put in. Kissinger had been a tenant of Draper's from 1874, and they had been talking backwards and forwards about getting the ram in there.

The tenant was very poor pay, and the landlord was somewhat exacting about his money, — not unduly so, — but there had been talk about it, and would not Mr. Draper put the ram in there? The spring that supplied the house was five hundred feet away from the house, and the women had to go that distance to get the water supply. It had been questioned whether Kissinger would not have it done. If he did, he would have got credit for it on his rent. Here is a letter written by Draper, Dec. 18, 1877, to his agent, who had been appointed in the spring of 1877 (complts, iii, 2178) :—

"MAGNOLIA, Decm 18, 1877.

"MR. HERMAN EPPLER Dear Sir Enclosed I return the agreement for Kissinger with the stock claus intirely left out. the understanding between him and me was, that I was to find one half the young stock and one half the corn to feed them. My only object was to feed the grain on the farm so as to improve it. But if Kissinger don't like that all right with me, and if He wont sign this agreement, He can stay under the old agreement and pay a certain Rint, and if he don't like that, I think the farm can be Rented to Esqr. Foulk's son-in-law Mr. Wallace. *Kissinger could pay all his Rents in improvements if he would.* THE RAM TO THROW UP THE WATER HE WAS TO PUT IN AND THE BARN WANTS REPAIRING. There needs a back Poarch & Smokehouse and Privy. He could haul the stone do the carpenter work, and change around so as to have but little money to pay, but I must have my rents in some way. I can't aford to keep the property and get nothing for it. I think I am as easy satisfied as anybody could be but must have my rents somehow. Write to me at once, and let me here what he does. Ever truly

"THOMAS DRAPER."

Now that letter was written in the end of 1877 to his agent, calling Kissinger to account for his neglect, who could have put in this ram and had not done it, and could have built those buildings and had not done it; and could have done this, that and the other, and has not done it. "I must have my money, or I must have him do the things which come to be the representative of that money." That was written to his agent in 1877. *A copy of that letter was in the hands of Drawbaugh's partners, before they put any of those witnesses on the stand to prove that that ram was there in* 1876. They had that letter in their hands before they put any of those witnesses on the stand; they had Draper in writing fixing the date 1878, before they ever called a witness to prove that it was there before that letter was written, and more than a year before.

Mr. HILL — What is your authority for that?

Mr. DICKERSON. — You may feel pretty sure that when I say anything I know it is so. Now I will nail that for your information, because *it is an awful thing;* and I don't make statements that are awful, unless I know that they are true.

The COURT. — I hardly think it is worth while to waste time in such detail. Of course I will have to search the record for myself.

Mr. Dickerson. — I want to impress those things now, because that disposes of so much of the testimony.

The Court. — In controversies of this sort there are always some salient facts. This case will undoubtedly turn upon very few considerations.

Mr. Dickerson — Yes, I think so. One of the facts here was that a man like Thomas Draper swore to that thing in 1874; and that is the only piece of testimony in the whole case that is worth a rush on the part of these defendants.

Now, sir, I think I have shown that Daniel Drawbaugh, in place of being that highly virtuous and honorable man whose testimony was to be taken without doubt or question, is an impostor; that he has deliberately imposed upon the Court by procuring testimony that is now admitted by Mr. Draper and the rest to be untrue in fact in respect to this very ram. It was evidently a point for them to establish; because, if Draper was right, then they have a case made in which Dan had two or three instruments before 1876 — vitally essential. It is the best testimony there is in the whole record, — he is the best witness.

The testimony of these thirty witnesses was begun in October, 1883, — that whole testimony that I have been commenting upon,— those thirty witnesses or more. I now read a document produced by the Dan's partner, Mr. Hill (complts, iii, 2287): —

"Baltimore, Md., June 27, 1883.

"J. J. Storrow, Esq.,
40 State St., Boston, Mass.:

"*Dear Sir*, — Please permit Lysander Hill, Esq., to see and take copies of all the papers and the book which you and Mr. J. C. Comfort obtained from me during the past six months.

"H. J. Eppler."

Eppler was the agent of Draper, and had this letter and these books in his possession, and had given them to Mr. Storrow. The other side wanted to see them, and Mr. Eppler gave that order on the 27th of June, 1883. Then the record says: —

"Complainants' counsel states that the week after the date of that order, respondents' counsel, Mr. Hill, came to him and said that Mr. Eppler had told him that complainants' counsel had some letters and papers, which they had received from Eppler, relating to the Draper farm, and that he desired to see them; whereupon the same were shown to him, and copies taken. The papers so shown were nineteen letters, the Draper-Eppler power of attorney of March 8. 1877, and the Draper-Kissinger agreement of Dec. 4, 1877. Said nineteen letters include all the Draper letters put in evidence in this deposition."

Now, sir, within a week after June 27, 1883, Mr. Storrow handed to Mr. Hill those letters, — those letters now that we are talking about, — this one. That was some months before they called a witness to prove that the statement of that letter was false. Have I answered you, sir?

Mr. HILL. — I misunderstood you; I thought you said we had seen these letters *before you had seen them. I saw them in your hands, the hands of your counsel.*

Mr. DICKERSON. — I said, as plain as the English language could be, that before you called and examined those witnesses you had that letter which showed that that testimony was false; and you challenged me to produce the evidence of that, and I produced it. Are you answered?

Mr. HILL. — I misunderstood your statement.

Mr. DICKERSON. — Oh! you misunderstood it, did you? Well, the Court did not, and nobody else in the room did.

Mr. HILL. — Then it was my misfortune. I thought you charged me with having access to those letters before you did.

Mr. DICKERSON. — *I charged you with having those letters in your hand when you called those witnesses; and you did.* You had them for months before you called those witnesses; and then you deliberately called those witnesses to swear to what was false, and what that letter showed was false.

Mr. HILL. — I think the evidence will show about that.

Mr. DICKERSON. — Now you had better not ask me any more questions.

Mr. STORROW. — This matter of the ram is referred to in our brief proper (pp. 525–531), and again in the appendix it is referred to more at length (pp. 781 *et seq.*). A somewhat similar issue arose about the alleged carrying away of bridges in the Yellowbreeches Creek; that is considered in the brief, p. 531; app, p. 752.

[*Adjourned to Oct.* 2, 1884.]

MR. DICKERSON. — My object in what I have said about the Draper affair and the ram is simply to show that these partners have been able to get thirty witnesses to swear falsely when they thought that the exigencies of their cause required it, — I might say have found many men in that county to *believe* falsely and then swear accordingly.

I said to your Honor, I think, that, notwithstanding the disassociation of the erroneous date of that ram, Mr. Draper, the witness, still insisted that his original visit to Drawbaugh had been in 1874; but he gave up his first statement that it was the year before the ram was put in. I read his letter to Mr. Storrow (defts, iv, surrejoinder, 253): —

"DOVER, DEL., May 1, 1884.

. . . "I could have shown you a letter that would have convinced you in a moment that I was correct in my statement [as to date of visit]. *But I could not get the consent of my mind that that would be doing right, nor have I ever shown it to the company, or let them know that I had it. I wish I did know who is right. I am convinced now that I was mistaken about the time the ram was put in.* I FEEL SURE THAT IT WAS NOT PUT IN UNTIL 1878. Every truly,

"THOMAS DRAPER.

"I may possibly be up next week."

That letter, of course, was very much objected to by Mr. Hill. In that same connection, your Honor will see, if you read it (I will state it), that at once we instructed our agents not to go near Mr. Draper, not to see him or communicate with him, or in any way to bring ourselves in contact with him, until the other side had got that information from him which he *did not wish to communicate to them* — his *conscience* being in the way a little. We supposed that was another trap (for there were a great many set for us in this case), like the Kahney business. Therefore we never went to see Mr. Draper, nor had our agents see him, nor communicate with him — no doubt to his disgust — until the other side put him on the stand; and then this letter came out.

There were just three people in the world who knew *for sure* about that ram: Dan Drawbaugh, *the man who made it and put it up*; Draper, the man who paid for it; and Kissinger, the man on whose farm it was put. We have Draper and Kissinger. *Drawbaugh* *does not appear;* his partner said to you in this room, "WHAT CHEEK TO ASK US TO PRODUCE DRAWBAUGH!" It would have required a great deal of check in him if he were produced.

Now, may it please your Honor, I pass to the considerations which must ultimately determine the judicial mind in deciding this case, and I propose to show to your Honor a mass of evidence *which is not contradicted*, *much of which is put in by the other side*, and which displaces this invention of the telephone out of the life of Daniel Drawbaugh as effectually as the frost displaces the salt from the water which is frozen, — it leaves no place in his life or his record for the telephone.

I begin with the man himself as he first appeared and does appear in the history of his supposed invention. In 1867 he was a partner of Gov. Geary of Pennsylvania, of his private secretary, and of a gentleman named Eberly, in the manufacture of nail-plate feeding machines, which he had invented, and which they furnished him the money to patent, to exploit, and to introduce into use, — if it were capable of being so introduced. What is meant by that machine is simply an apparatus for feeding a strip of iron into a machine that cuts off nails; the machine *bites* the nails off at the end of a plate, which has got to be wriggled into the machine alternately right and left. Of course this is a very old machine: no nail machine exists without a feeder for the plate. Dan told them he could improve the old plans, and he got those people into partnership with him for that purpose. They built machinery and they got it into McCormick's mills, the largest nail mill in Harrisburg, owned in part by the Cameron family, I believe. Of course it was a failure, and it was turned out, as everything he ever did was.

MR. HILL. — I have no opportunity to reply, I know; but I know that you do not want to misstate facts.

MR. DICKERSON. — Not at all.

MR. HILL. — It was tried at McCormick's factory at West Fairview, and the laborers rose against it and made threats. For that reason it was discontinued.

MR. DICKERSON. — Very good; as you please. Then it was an invention of such merit that a combination of labor was made against it, and it could not go into use. It disappeared from public use.

But Drawbaugh is a remarkable man; he belongs to a class of which a great many are to be found in this country, in which Pennsylvania seems to be somewhat prolific, and of which Keely, the motor man, is at present the type, — men who have the capacity to persuade their fellow-men that they are great inventors, and thereby get their money. They are persuasive, pleasant, good-natured, agreeable sort of fellows, who are bubbling over with hopes and dreams and expectations, and who inspire other people with their *apparent* confidence. They operate upon their fellow-men in a kind of molassesy way, bringing in the flies that stick fast to them. Drawbaugh is one of that kind of men, who has exhibited this ability in a remarkable degree. Notwithstanding his failure in other things, "on account of labor combination" against him,— I am not going to quarrel about terms — others might give a different reason, — he persuaded a number of his neighbors, men of wealth and standing in the community, and of high character in every way, to go into the manufacture of his rotary molasses spigot, which could also be used as a rotary pump. One of the very old delusions in mechanics is a rotary pump. Next to perpetual motion, there is nothing that has attracted the attention of inventors more than a rotary pump. It is so natural that one should turn a crank and the water should come out all one way, without any reversal or stoppage as in other pumps. It is in the nature of things, however, impossible to be made perfect. They have all failed. There are lists of rotary-pump patents by the page in the Patent Office reports before his day. Every tyro in mechanics first thinks of a rotary pump before he knows the law that makes it impracticable.

Well, I assume that Drawbaugh didn't know that they were necessarily good for nothing. I do not charge any fraud upon him about that. He got those gentlemen in, and they invested about $25,000 in machinery to manufacture his rotary pump; and they set up an establishment at Eberly's Mills, into which he moved his own machinery, which he already had, and had been using in another shop; and they made him their "master mechanic." They also put him in funds; they paid him $6,000 in cash — $5,000 from one company, and a $1,000 note of another, which he got discounted — and gave him one of the shares of this company, for which they had paid $1,000 cash on their part, and made him their master machinist. Of course the thing was a failure, as it had been for a century before him. Drawbaugh says in his examination afterwards that it is a good thing, but people found it wouldn't wear. Well, that is just what ails it, — it won't wear. It is not good for anything; it cannot be made to wear. Everybody knew that before; but perhaps he didn't. About that time he began to tinker with electricity, and to work upon various other contrivances in that shop, and he used the tools, which he was free to use. A part of the money which he got from that sale he put into a house, and became a land owner, — a house for which he paid $2,000 in cash, while there was a mortgage on it for $300, which he afterwards paid off. In Pennsylvania they have a convenient method of creating a mortgage, which cuts off dower, by giving what they call a judgment note, and putting a stay of execution upon record. Now, that is a first-rate mortgage; it can be enforced any time after the stay expires; and there was upon the house when he bought it one of those judgment notes for $300. He then rented one half of that house to a good tenant for $110 a year, and he filled the other half with furniture and many luxuries, — all right and proper that he should; and he had so much of it, may it please your Honor, that when, eight years afterwards, he bought another house and removed that furniture, it took *seventeen* Pennsylvania horses with a string of Pennsylvania wagons to move that furniture to another house, and as many to bring it back when he made another change. His house was as well furnished, his family as well clothed, and himself living as well as anybody in that whole village. He was employed by this company to do their work, and he kept on doing it.

In 1870 this company had experienced the fatal effect of his embrace, and was dying of dry rot. But still they did not lose confidence in him. He had that buoyant and inspiring power so charming to everybody, except its victims, and they said, "Now we will form a coporation, and we will call it the '*Drawbaugh Manufacturing Company*,' in your name and in your honor." Notwithstanding the decrepitude of the whole concern, he still had their confidence, and they called it the "Drawbaugh Manufacturing Company," and by formal vote elected him "master mechanic" in 1870, at a time when, according to the present pretension, his telephone was filling the community with wonder and admiration. The new company soon got out of work, although they advertised largely with his name, and wanted something to do, and they passed resolutions on their minutes expressing their desires. He had told his partnar in 1869 that he could invent a gas governor. Well, a gas governor, as we all know, is older than Dan Drawbaugh. It is put on the gas main as it enters the house, and regulates the tension of gas so that the flame will not flare. He actually went to work and made a gas-making apparatus, — on a small scale, of course, — and piped this factory with gas pipe, and then sent for his partners to come and see his gas regulator work. Well, he didn't know anything about that thing, of course, and the machine exploded, as necessarily it would, the gas being under confinement, with no relief escape.

In cross-examining the complainants' witness, Jacob Carns, workman in the shop (complts, ii, 922), Drawbaugh's counsel asked if Drawbaugh did not put up a complete gas apparatus to exhibit his gas governor, with a view to getting the Drawbaugh Manufacturing Company to take hold of it and put it upon the market, and whether he did not "try to get the company to add the stamp canceller to the articles they were manufacturing and getting out," and "to take hold of the lamp-shade press and work that up also," and "to take hold of the blower," — to some of which questions the witness replies yes; to one, he replies that the blower was not a success, and to the others, that he does not remember. This of course means that the claimant had stated to his counsel that he did so try.

The company did not take them up because, for various reasons, these particular things did not promise success, — not because they were indisposed to exploit his inventions; on the contrary, they continued to invite him. The chronological sequence shows this.

Drawbaugh testified (defts, ii, 1001): —

"I made the second [gas governor] more complete, in order to show it to the Drawbaugh Pump Company, for the purpose of illustrating it to them, for the purpose of getting them to take an interest in it; there were some inquiries made about the machine, and it was found that the Gas Company would not allow it to be attached to the meter; I guess for that reason there was nothing done, they didn't take an interest in it."

The date of this is fixed by the records of the association (complts, ii, 1130–1; iv, 317–8): —

"Jan. 29, 1869. Daniel Drawbaugh agreed to give his gas Governor that HE IS NOW PREPARING TO SECURE A PATENT FOR to the company for the company's use and benefit the conditions to be agreed upon hereafter."

The exhibition in consequence of this vote, and which is referred to in Drawbaugh's deposition, is described by Mr. H. S. Rupp (complts, ii, 1130): —

"*Q.* 13. Did your company meet and examine the gas governor referred to in that request?
"*A.* Yes, sir.
"*Q.* 14. Was it an accidental meeting, or did the members of the company meet especially for the purpose?
"*A.* It was a special meeting called for that purpose.
"*Q.* 15. Where did the members meet and examine this gas governor; and give some description of the exhibition of it which was made, or attempted to be made, on that occasion?
"*A.* They met at the company's shop; Mr. Drawbaugh had everything prepared to manufacture the gas and show the lights, when the members met. The gas was made outside of the building, near the blacksmith shop. The lights were fixed, I think, on the second floor, and pipes were laid to convey the gas to that story, — it might, possibly, have been the first. It worked very well for a while, but the seam of one of the retorts opened by being heated, and that ended the exhibit of the gas governor."

Mr. Rupp then continues about the next proposal: —

"*Q.* 16. In the minutes of Jan. 29, 1869, already referred to, I find the following: 'On motion of William R. Gorgas and D. Drawbaugh, it was agreed that Henry S. Rupp be authorized to advertise in the *Patriot and Union* and *State Guard*, Harrisburg, one insertion each week for three weeks, that the company do custom work and get up designs, etc.' I infer from that that the company was seeking to do some work besides the manufacture of rotary pumps and measuring faucets; what is the fact about that?
"*A.* The fact is that they were seeking other work.
"*Q.* 17. In the minutes of the meeting of March 26, 1869, I find the following: —
"'On motion of Henry S. Rupp and Daniel Drawbaugh, it was

agreed that Daniel Drawbaugh shall, as speedily as possible not to interfere with other necessary work, get up and make a screw machine for the use of the shop and for its benefit.' What new project and kind of work for the company did that refer to?

"*A.* It referred to getting up a machine for manufacturing screws.

"*Q.* 18. What brought that project before the company, and state what proposals and suggestions Mr. Drawbaugh made about it, so far as you can recollect?

"*A.* I don't know that I am able to say exactly what brought us to — I think there was a gentleman there from Buffalo, a Mr. Dorsheimer, a relative of Mr. Gorgas, who told us about a manufactory that manufactured screws, stating that it was a paying business. Mr. Drawbaugh said that he could easily invent a machine, or get up a machine, that would manufacture screws; I think it was this that led us to this project of manufacturing screws."

He still held that company. After the gas exhibition they passed another resolution, — that he should invent screw machinery, for the use of the company: they must have something of his to keep them going. At that time, that room where they met was full of telephones, if the testimony which has been brought before this court be true. *But he never said "telephone" to a man of them*, although that concern ran until 1873. May it please your Honor, there were nine members of that concern. Eight of them survive, one is dead. There were about seventeen or eighteen workmen in that concern during those years, from 1867 to 1873. Sir, *not one man of that partnership*, and not one man of those employed mechanics (with two exceptions, who turned up as witnesses and are disposed of in our brief) ever saw, or ever heard, or were ever told, that Dan Drawbaugh had, or had invented, or had in their building, a talking machine, — *not one*. And those men are his friends, — they are his friends to-day; the molasses has them stuck yet, — they are his friends to-day. Some of them had a meeting, while this suit was pending, in the house of one of them, at which three of them assembled with Drawbaugh and his legal partner for the purpose of discussing whether they could not get up some evidence — of what? of what? Why, of his poverty. Not of his having made the telephone; not of his having it in their shop all that time; but of his poverty. They decided they could not even do that; they would like to, but they could not (complts, ii, 1140–1). He put upon the stand three of those partners, his friends, *and never said telephone to one of them;* and one of them was the *treasurer and timekeeper and superintendent* of the company, who spent his days in that place, where, if this testimony be true, country loafers, bummers, fellows like the Ditlows and Kahneys and such trash, were there talking all the time, and reading newspapers through telephones, that were there in plain sight, and known to the entire public, — so they swear. That place was forty feet long and twenty-five feet wide — you could get it into this room two and a half times; that was the size of it; it was a box, forty feet one way and twenty-five feet the other, where these men were huddled in together, and where Dan Drawbaugh had, as they now swear, all over that forty by twenty-five feet, this very apparatus, open to public inspection, and used by everybody who chose. Brief, 244–256, complts, ii, 1140-1.

Sir, that ignorance of all these men is a *fact* in this case; it is not an argument, it is a fact, which fact has got to be reconciled, if it can be, with the testimony on the other side. It cannot be reconciled; something must yield. That *fact* is what my opponents call negative evidence. Well, I think it negatives them out of existence. It is exactly as if some loafers or bummers should come and swear that in my house there were from year to year telephones stuck all round the house, and my family and I, and everybody who ever lived in it, should come and say that we were there every day, and that there was no such thing. That is what they call negative evidence. All this about the Faucet Company is in our brief, pp. 243–257.

Well, sir, Dan's fatal breath brought this company to the grave; and Dan then got another set of victims to come in and buy it — and they were the Hauck Brothers, in 1873. Hauck and his brothers paid $7,000 of new money, and got for it what had cost the others about $30,000. That much had shrunk and disappeared — "gone where the woodbine twineth." These brothers paid $7,000 to go into that place and see whether they could not make rotary pumps work. There was one man of that concern, David Hauck, who was an exceedingly intelligent man; and when you read his deposition you will perceive that he is a remarkably acute reasoner, and a good mechanic. But Dan was too much for him, and got him in there. These brothers went to work there, making these molasses spigots, or rotary pumps, or whatever they were, in that place, from 1873 to 1875, Dan Drawbaugh working in the shop with them, but not for them.

Now I am going to tell you a little of the poverty there was there. The Haucks offered him "*his own price*" — of course, that meant a reasonable price, but "his own price" — to work for them on their faucets; but he declined, because he could do better working his jobbing shop for himself; he had the tools and the machinery, and he declined the offer, because he was doing job work for the country side, and it was better business than working for wages, and it was more independent: he could spend his time on his fooleries, of one kind and another, as he pleased. Brief, 357.

During that time Drawbaugh claims to have *invented* several good things. He "*invented*" this magneto key that we hear about, and he was very anxious to get it tried on a telegraph line, because, as he said, it would supersede the present telegraph. Now note that. These witnesses are swearing from time to time that Dan was going to supersede the telegraph (brief, 80), and they attribute it to his telephone. But it is certain that he said that this "key" would do so. The key, however, was very old; it was the Siemens key. Dan, of course, knew about it. We have not traced the books with it into his hand, but I suppose he knew about it. It is in any handbook of electricity. Well, sir, he got David Hauck to take him with his Siemens key to a telegraph station, where Hauck's friend was operator, and Hauck got leave for him to try his telegraph key on a real telegraph line at Mechanicsburg, in order to ascertain whether it was a practical and successful thing to "supersede the telegraph." At this time, as he now gets witnesses to swear, he had got the telephone up to a point where he had **B**, **F**, **C**, **I** and **A**; he had not got **D** nor **E**, which are the magneto telephones patented by Bell in 1877, but he had everything behind that, and, having all these, *he took that telegraph key and not the telephone up to a real line to have it tried*. Of course it was worthless. An operator cannot wabble that three or four pound magnet by his fingers, and send signals by it with any effect. The thing operated by the finger must be something light, that the finger can handle quickly and easily. Dan tried it, and the operator told him it wouldn't do. What did he do then? He went back and *made another of these keys*, reducing the weight of the moving part. There is no drawing of that thing here, but, so far as the magnet goes, it is exactly the same thing as the horseshoe magnet on C. He went to his shop and made another one, and then took it to Harrisburg and showed it there, and of course it was of no use; BUT ALL THE WHILE HE WAS STARVING FOR FOOD, AND WILD TO GET SOME ONE TO TRY HIS TELEPHONE!! Brief, 322.

After a while there emerged an improvement on the molasses spigot, which was invented by somebody in that shop. The old one was good for nothing, and Hauck, who was trying to make it work, and had his $7,000 in it, was trying to improve it so that it would work, and an invention was made, and Dan Drawbaugh said *he* also invented the modification. I am not going to talk about who was the inventor: it is enough to say that there was such a controversy between those two persons. Dan's old company, before that time, had said to Drawbaugh that he ought to give them any improvements on the spigot he might make; but he refused. They said, "We have sunk a great deal of our money here on your invention, and you ought to help us; and if you have any new ideas on it, give them to us." Dan refused, and said he meant to get that money for himself, and they shouldn't have his new ideas. He had a right to say that. I do not bring it against him as a legal wrong, but it was characteristic of the man; and so his new ideas, if he had them, slumbered until Hauck got the same ideas, and then Dan claimed them, and an interference suit arose in the Patent Office.

The way that interference came about was this: Chellis, the ninety-nine-cent man, and this Dr. Moffitt, of whom we have heard, bought from Dan, in 1878, the potentiality of a patent on the new molasses spigot, and paid him $250 cash for a part interest in it; and they went into the interference suit with Mr. Hauck, who claimed to be its inventor. Altogether a fair transaction, — nothing wrong that I know of about it. Now there is some very interesting reading in that trial. Drawbaugh made the issue, and undertook to prove two things: *first*, that he was a mechanical expert, qualified to testify in that capacity before the court; and, *second*, that he was a "*natural-born*," original and great inventor, and therefore that he ought to be selected by the

Patent Office rather than Mr. Hauck as the inventor of this wonderful, new, improved molasses spigot; and, to sustain this issue, Dan Drawbaugh used Hauck as his own witness. Now Hauck, may it please your Honor, had been Drawbaugh's companion, working alongside of him for years in that shop forty feet by twenty-five, where Dan had all these telephones, and where they say the whole country came in to see them; and he had been Dan Drawbaugh's friend so much as that he had gone with Drawbaugh and got him leave to apply and try his key upon a telegraph line; and therefore no man knew Dan's inventions in these years better than Hauck, and he could be used with the greatest effect to prove Dan's originality of genius by merely telling what he knew of Dan's work. Mr. Hauck was questioned by Dan's present partner, Jacobs, with Dan present, to help the examination. Dan and Chellis and Jacobs were on one side, and Hauck was on the other. When Hauck was on the stand to tell his story, Dan undertook to prove his own genius by Hauck; and here is the first question by Dan's partner to Hauck (complts, iv, 252; i, 835): —

"*X Q* 3. He [meaning Drawbaugh] is a machinist, is he not?
"*A*. That is one of the trades he is proficient in.
"*X Q*. 4. Then he is a man of versatile talents, is he?
"*A*. He is."

I am here, your Honor, to prove that to-day.

"*X Q*. 5. AND A BORN INVENTOR, IS HE NOT?
"*A*. That I cannot say, as I have only known him for *about ten years*."

He was not there when Dan was born, your Honor!

"*X Q*. 6. You are aware, however, that he has made a great many useful and ingenious inventions, are you not?
"*A*. What he has made since *I have become acquainted with him, that I have any knowledge of*, I would call *imitations*, although some of them might be patentable.
"*X Q*. 7. To what inventions do you refer?
"*A*. I refer to the blower spoken of in this controversy; also to an automatic boiler feeder, AND TO A MAGNETIC CLOCK, and to a steam siphon or a steam pump, and a hydraulic ram; that is all I can think of at present.
"*X Q*. 8. Mr. Drawbaugh also invented a measuring faucet, did he not, the patent upon which you subsequently purchased?

"*A*. He did.
" X *Q*. 9. Was that an imitation, too?
A. It was, to a great extent."

X *Q*. 29. While he was perfecting his clock he told you about invention and his experiments upon it, did he not?
A. He did.
" X *Q*. 30. Once, or more than once, did he talk to you?
"*A*. He talked to me about it a great many times.
" X *Q*. 31. Did he ever talk to you about any of his other inventions?
"*A*. He did.
" X *Q*. 32. *He was generally pretty free in communicating his ideas to friends, wasn't he?*
"*A*. He was.
" *X Q*. 33. About what time did you have your conversation with him about his magnetic clock?
"*A*. Principally from 1875 to 1877."

. . . .

" X *Q*. 42. Returning to the subject of the magnetic clock, in what points is that an imitation?"

He replied (x-ans. 49) that it was taken right out of the encyclopædia.

And then they cross-examined him to see if they could prove by him whether Drawbaugh had not introduced some modifications of detail in his clock as to which the witness said that he could not tell, — but the Court knows now what the facts are, — and finally they wound up with this: —

" *X Q*. 52. And you undertake to swear that Daniel Drawbaugh is an imitator and not an original inventor.
"*A*. I believe him to be an excellent imitator, while I do not say that he could not be called an inventor."

And there they left it. Well, they did not get much satisfaction out of that witness.

Mr. Hill. — That was the contestant?

Mr. Dickerson. — Yes, but you called him as your witness on this issue, and tried to make him prove your case, that your partner was the great man that you now say he is. His enemy swore he was not. Well, his enemy certainly is not to be trusted in every sense, and he certainly would not help Drawbaugh. I agree to that. But you could have silenced his enemy by making him admit that years ago Dan had the Bell telephone right in the shop where this man worked; *and you never said telephone to him.*

Now Mr. Hauck's turn came. Thus far, your Honor sees, the dog was a little ahead of the wolf that he was hunting; but, as soon as Drawbaugh went on the stand, Mr. Hauck said, in substance, "Well, you have called me as a witness to prove that you are a great inventor. I don't know that you are. I have told you all I know about you. You are an impostor. Now tell me what you know about yourself, — what have you done? I want to know now. It is your issue; tell me." Now, sir (complts, iv, 142): —

"*Q.* 104. *Since 1866, what machines have you conceived and perfected that have worked satisfactorily?*"

This to Dan Drawbaugh, — the wolf was after the dog very fast just then!

"*A.* To the best of my knowledge, I think that they all have. The *nail machine* gave satisfaction. I had it running in the works, but the nailers drove me out. The *tram and red staff was a good machine*, and adopted by a number of millers, and acknowledged by them to be a good machine. The *magnetic clock I consider a good thing, but I am not through with experiments on it.* I believe this *last faucet is a good thing.*"

He didn't say the *first one* was.

"X *Q.* 105. Was the nail machine you speak of a success, and was it ever put into general use?

"*A.* *I cannot say it was not a success;* but from reason of the nailers being down on it, *I was afraid* to put them in."

This is not exactly his partner's statement now, but I will take it.

"X *Q.* 106. Are there not now, and *were there not at that time*, other patented machines in use at other mills, that were constructed to accomplish the same purpose that yours was?

"*A.* There was at the time that I was putting a machine in the works of Harry McCormick's nail mill at West Fairview, Cumberland Co., Pa., a machine or feeder for making small nails only. Mine was intended for larger nails. I worked my machine on ten or twelve penny nails. Some years after the trial of my machine I seen other machines for the same purpose. I would correct my former statement, and say my machine was intended for all sizes of nails.

"X *Q.* 107. Was not the old faucet a partial failure until the Haucks perfected it by constructing a new machinery to manufacture it by?

"*A*. No, sir.

"*X Q*. 108. Was not the rotary pump a failure practically?

"*A*. *I cannot positively say it was. There were parties that liked them, that used them, but thought they were not very durable.*

"*X Q*. 109. Is not the magnetic clock, *so far, a failure?*

"*A*. No, sir; I don't think it is; but, as I stated before, I am not through with my experiments.

"*X Q*. 110. Will it keep accurate time?

"*A*. At my place I have tried several, and they kept accurate time. I regulated and *tried them by a transit*."

There was Drawbaugh called upon to vindicate himself in the assertion that he had made, and upon which he had called his adversary as a witness. Well, sir, that piece of testimony needs a little explanation. Somebody ought to tell us about that now. The whole deposition was put into Dan Drawbaugh's hands in this case, and he was asked in substance whether it was correct, and whether he wished to modify or explain anything, to which he replied that it was correct, and he had nothing to say. He took it, read it, went through with it, and said that he was content with it as it was; it was right (defts, ii, 1065, x-ans. 1480; *ib*. 1070, x-ans. 1497). Yet that needs somebody to explain it; and we fortunately have got the explanation. It is in the brief. *This is what they ask your Honor to believe is the explanation of this testimony*, — because it is the biggest kind of a fact that stands right across the telephone; and *that was in the summer of 1879*, when Bell had been famous for three years. Now I will turn to their brief, p. 297. They there quote, your Honor will perceive, the very question and answer that I have already read, and they thus explain it: —

"Now, examining the question put to the witness, it will be seen that it *does not include the talking machine which was conceived prior to* 1867, *but only such machines as were conceived* '*since* 1866,'— that is to say, in 1867, or subsequently."

Then they go on, and about half way down the next paragraph say: —

"He therefore specifically mentions four inventions."

Mr HILL. — Read the whole of it; don't pick out parts.

Mr. DICKERSON. — I like to gratify you, and I will, because I find it always benefits me when I gratify you. I read it all.

"Again, the witness's answer shows conclusively that he *did not feel called upon by the question to set forth a list of his inventions.* Accordingly, he answers the question in one line: 'To the best of my knowledge, I think they all have.' That was a complete answer to the interrogatory, disposing, in one sentence, of the whole matter of the inquiry. Having given this answer, it evidently occurred to his mind to mention some of his machines which had notoriously been in public use and on sale, and of the *acknowledged merits of which his interlocutor must be aware.* He therefore specifically mentions four inventions out of the large number which he HAD MADE DURING THE PERIOD OF THE INQUIRY. He did not even specifically mention all the machines."

Now, may it please your Honor, what were those four that he mentioned that were *not conceived before 1866?* Because your Honor now sees the explanation is that he was under the limitation of 1866, and anything that he conceived before that he could not *conscientiously* put into his answer. What are the four machines? The nail machine; the tram and red staff; the magnetic clock; and the last faucet. Now I shall astonish your Honor by telling you that the nail machine was patented in 1865 — one year before the limitation of the question begins; and the tram and red staff was patented in 1863, three years before the limitation. Of course, Dan Drawbaugh didn't come on the stand to tell any such lie as that; he knew that the tram and red staff were patented before 1866. But, sir, the patents are in this record. "Levelling the faces of millstones; application Feb. 23, 1863; patented May 12, 1863." That is one of those things that he had not conceived of before 1866, as his partner assures you in print, and which he therefore conscientiously excluded from his answer. The next one is the patent for the nail-plate feeder, applied for Aug. 24, 1865, patented Dec. 12, 1865. (These are in complts, iv, 345–6.)

Now, may it please your Honor, what do you think of that? That testimony is a fact that had to be dealt with. They could not jump it; they could not go under it, or around it, or over it. Dan Drawbaugh could not come to meet it, but his partner can, and he tells you Dan *did not make those things before 1866*, and therefore he put *them* into his answer and omitted the telephone, — when they were patented, one, one year, and another three years before, — but that he conceived the telephone *before* 1866, and therefore he *omitted it* from his answer.

Mr. Hill. — I said the terms of the question did not call for anything of the kind.

Mr. Dickerson. — Well, if I have not got that through your hair, I give it up.

Now, may it please your Honor, there is another piece of business here. In this interference, as I read to your Honor, Drawbaugh said his clock was not yet completed; he thought it a good thing, but it was not yet completed. Didn't it keep time? He said it did; but still he was going to make it keep a *little better time.* He had got somehow mixed up between the sun, and the transit, and the clock; he didn't know which was right, but he was going to get them so that they would agree in some way or other. Well, sir, what was the fact about that at that date? This Dr. Moffitt, of whom I have spoken, this dentist, with the habit of disappearing —

Mr. Hill. — "Habit of disappearing" *is a mere assumption.* There is nothing of the kind in the testimony, that I remember.

Mr. Dickerson. — I thought you would say that again, so I am ready for you. Turn to p. 991 of defendants' Vol. III., surrebuttal. George May, their witness, says: —

"*X Q*. 110. What work did you do for Dr. Moffitt in 1882?

"*A*. I went there to hire with him to do his work, and then Mr. Moffitt went away, and Mrs. Moffitt thought there would be no more work for me, and so I went away.

"*X Q*. 111. He went *away pretty suddenly, and people didn't know where he had gone, isn't that so?*

"*A*. *Yes, sir.*

"*X Q*. 112. His wife was alarmed about him, and sent Squire Drawbaugh to hunt for him, didn't she?

"*A*. That is more than I can say.

"*X Q*. 113. *It was a* NUMBER OF WEEKS *before he was heard of, wasn't it?*

"*A*. *Yes, sir.*

"*X Q*. 114. And then it was reported that he had got on a drunk and gone off in that condition, was it not?

"*A*. That I cannot say.

"*X Q*. 115. You heard that story about him, did you not, at the time?

"*A*. I kind of heard something about him, but never paid much attention to it."

Now you had better not interrupt me any more.

Sir, this Dr. Moffitt was Drawbaugh's partner then. Your Honor will recollect that in this faucet business, about which the Patent Office fight was, Moffitt, Chellis, and Drawbaugh were the three partners. Moffitt had one of those clocks sent to his house. They never sold one. Two or three were made, but they could not sell one. They could not even give one away. Dr. Moffitt was a dentist. Well, a dentist chops up his days into hours and minutes to suit his customers; he has got to have some kind of notion of time, else he cannot keep his appointments. It is necessary for a dentist to know when his half hours come round. We cross-examined him upon that (defts, i, 521): —

"*A*. I had one in my house.

"*X Q*. 33. When?

"*A*. I lived on Market Street at the time; it was while the Clock Company was in operation; I think it was in 1878.

"*X Q*. 34. Did it ever trouble you by stopping and not keeping good time?

"*A*. No, sir.

"*X Q*. 35. Did it always keep good time and not stop?

"*A*. No, sir; it did not always keep good time.

"*X Q*. 36. Did it always keep going?

"*A*. Yes, sir."

Well, of course it will keep going: as long as electricity runs, the clock will go.

"*X Q*. 38. Did you ever complain of it more than once?

"*A*. I don't remember; I remember of one time.

"*X Q*. 39. Whom did you buy it off?

"*A*. No one.

"*X Q*. 40. Do you mean that you only borrowed it?

"*A*. Neither one; I did not own it, nor I did not buy it, nor I did not borrow it.

"*X Q*. 41. How did it come into your possession?

"*A*. It was put there by the company, with my permission.

"*X Q*. 42. Did you tell them that they must come and make it go better, or come and take it away?

"*A*. I don't remember; I wrote to one of the company, not to Drawbaugh, that if the clock did not run better they must take it away.

"*X Q*. 43. Did Drawbaugh or any of the company come over to see you, in consequence of that complaint?

"*A*. Mr. Shettel came to see me.

"*X Q*. 44. Did not Mr. Drawbaugh come too?

"*A*. Mr. Drawbaugh did not come at that time."

His own friend and partner turned it out of the house. Why, the poor fellow could not keep any time for his patients; could not tell when his dinner was ready. His cook would have dinner on the table half an hour fast, or as much slow; and his patients would come and say, "Why didn't you keep my appointment?" "Well, Dan's clock is all wrong." "Take it out!" Didn't Drawbaugh swear it was a good invention? Yes, he swore it was a good thing, but he hadn't got done experimenting on it. One of his experiments was on Dr. Moffitt.

There was another interesting fact in that case. Dan Drawbaugh was going to qualify himself as an expert, and he testified that he was a patent solicitor (complts, iv, 123): —

"*Q.* 100. Have you applied for and procured in person patents for any of them, or have you not?

"*A.* Yes, sir; *I mean I made my own specifications, models and drawings, and drew my claims.*

"*Q.* 101. Have you or have you not done the same *for other inventors?*

"*A. Yes, sir; I have.*

"*Q.* 102. How long have you been working in machinery?

"*A.* From the time I first could work.

"*Q.* 103. Have you worked at anything else?

"*A.* To the best of my knowledge, I have not.

"*Q.* 104. Have you or have you not read and studied much upon the subject of mechanics and upon kindred subjects?

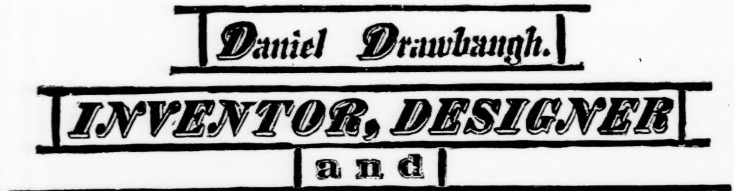
"*A. I have read a good deal, more particularly upon mechanical subjects.*"

Thus he qualified himself; and he did it again upon cross-examination good and strong (complts, iv, 155): —

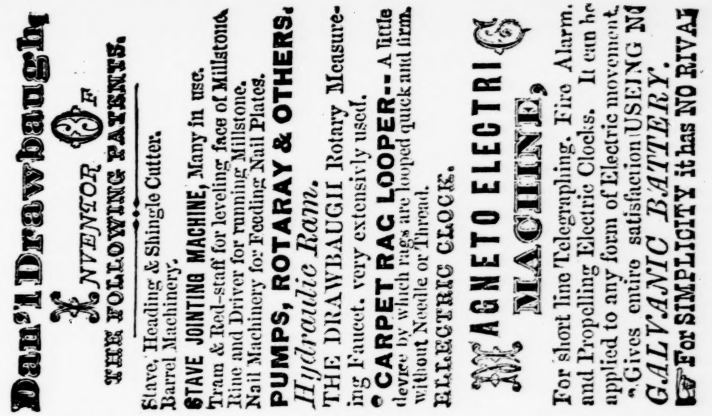
"*X Q.* 180. You stated that you have made your own specifications, models and drawings, and also done so for others: have you not uniformly had an attorney of record in all your patent cases, in addition to yourself, who has supervised and corrected your specifications and claims?

"*A.* All my cases through the Office were gotten by attorneys, but some of them were dictated and drawn up by me. Though I have taken out a number of patents for other parties, *I prepared their papers and drawings, but they made their own applications. It was not then necessary to have a power of attorney from the parties. There was no attorney of record in these cases.*"

He was swearing as to his capacity, in order to be believed by the Court, as an expert. In this case, however, it was an uncomfortable fact; because he had told this Court, and sworn to it, and they had in their answer sworn that he could not get a patent for want of money,— yet all this time he was a patent solicitor, and had been getting patents for other people. It came to be a very uncomfortable fact on record, and it was necessary to displace that fact. Thereupon they called their other attorney, Benjamin, and he swore Drawbaugh was entirely incompetent to take a patent, and didn't know anything about it. They called Drawbaugh, and he swore he didn't know anything about it, and couldn't do it (defts, ii, 900, 929; ii, 1270–1; brief, p. 198). In this case the other side of the picture turned up, and he had to *disqualify* himself; because, if he was qualified, why hadn't he filed a specification for himself in the Patent Office? and then $15 was all the money needed. Pretty bad! He was between the devil and the deep sea. Well, they took the deep sea this time, and they swore him through that he could not have done it. He swore to it, and his attorney swore to it. I will not read it. I have stated it. Very well. But, unfortunately at that time, Dan Drawbaugh had a card out before the public, of which this is a photo-lithograph copy (complts, ii, 1212; iv, 261):—



Daniel Drawbaugh.
INVENTOR, DESIGNER
and
SOLICITOR: PATENTS.
☞Also Models Neatly Made To Order.
Eberly's Mills,
Cumberland County, Pennsylvania.
[See Other Side.]



Dan'l Drawbaugh
INVENTOR OF
THE FOLLOWING PATENTS.

Stave, Heading & Shingle Cutter.
Barrel Machinery.
STAVE JOINTING MACHINE, Many in use.
Tram & Red-staff for leveling face of Millstone.
Rine and Driver for running Millstone.
Nail Machinery for Feeding Nail Plates.
PUMPS, ROTARAY & OTHERS.
Hydraulic Ram.
THE DRAWBAUGH Rotary Measuring Faucet. very extensivly used.
• CARPET RAC LOOPER-- A little device by which rags are looped quick and firm without Needle or Thread.
ELLECTRIC CLOCK.

MAGNETO ELECTRIC MACHINE,

For short line Telegraphing. Fire Alarm. and Propelling Electric Clocks. It can be applied to any form of Electric movement. "Gives entire satisfaction USEING NO *GALVANIC BATTERY.*
☞ **For SIMPLICITY it has NO RIVAL**

Now, may it please your Honor, we had heard about that card, and you can imagine what a time we had in getting it. I will not tell the story how it was done; but it was curious. All that had been issued *suddenly disappeared* from the face of the earth, and the difficulty was to get one. Money was no object to get that card. It would amuse you to know how it was done. I have not time for that, and of course it is not on the record. But we got it. Here was the regular business card of this man, who was taking twenty dollars apiece from people for obtaining their patents. And before we got it, and when they thought we should not get it, they had called him and their attorney, Benjamin, to testify — what? That he is entirely incapable of doing it; THAT HE IS AN IMPOSTOR. Did I say too much when I said I was going to prove him an impostor?

Now, your Honor, those are facts; not arguments, but facts. There is only one conclusion from them. But that card ought to be explained somehow or other. There should be some reason given why it ought not to carry its logical consequence. It gives a list of Dan's inventions, and *does not say telephone!*

The COURT. — What was the date of the card?

Mr. DICKERSON. — Between June, 1874, and the latter part of 1876. There were two editions published of them.

Mr. HILL. — The testimony of E. R. Holsinger, called both by the defendants and the complainants, shows the date of the card.

The COURT. — What do you claim as the date of the card?

Mr. HILL. — Between the middle of September, 1873, I presume, and the last of November, 1876. I presume some time while Holsinger was living there. It was published by Holsinger while he was living at Eberly's Mills, which was from September, 1873, to the last of November, 1876.

Mr. DICKERSON. — The joke of it is that Holsinger bought the type to print it with, and *the pauper Dan lent him the money to buy it.* And this was done after June, 1874.

The COURT. — Is there not a reference to it?

Mr. DICKERSON. — Yes, sir.

Mr. HILL. — A reference in both briefs.

Mr. DICKERSON. — Yes; we will not differ about it.

It is in the complainants' brief, pp. 196, 199. Holsinger proves that the peculiar type with which it was printed was bought the last of May, 1874, with money, part of which Drawbaugh lent him; and then he testified (complts, ii, 1212): —

> "*Q.* 9. Please look at the advertising card, which I now show you, and state whether you printed it while you lived at Eberly's Mills.
>
> "*A.* Yes, sir.
>
> "*Q.* 10. State, as near as you can recollect, how many of them you printed.
>
> "*A.* I printed one hundred and fifty the first time, and think I printed a second lot of one hundred and fifty; I am not positive as to the second lot."

Drawbaugh has not denied this, and they did not cross-examine Holsinger about it. One lot after June 1, 1874, and after they were used up a second lot.

Now, your Honor, that card does need some explanation. It is like Dan's deposition in the Hauck case: it needs some explanation; and it will not do for his partner or his counsel to stand up in this court and not give any. But I notice that our eminent, very able and honorable friend, Mr. Edmunds, — and, if there be a man upon earth that can find an explanation, it is he, — *did not mention any of those things, and didn't attempt to explain them.* I notice that Dan's partner does not in speech, but he does in his brief; and I wish your Honor to look at it, because it is a most interesting specimen of jugglery. I refer your Honor to defendants' brief, p. 295, where Dan's partner gives the reasons why the telephone was not mentioned on this card. They were three. The first one is, *that he omitted it* PURPOSELY, for *fear his telephone would be stolen;* that is, he feared that with this card giving notice to the world that he had a telephone, everybody would want it, and he was in danger of having it stolen. The second reason is, that it *was omitted* BY ACCIDENT, and that he and Holsinger being very poor when they discovered the accident, didn't have money enough to reprint it. And the third reason is, that he was afraid he would lose custom if he said he had invented a telephone, because people would believe him crazy to make a thing nobody wanted, and so he omitted it. I don't want to lose a word of this, because it is rich. Dan and his partner are giving their reasons. I read them from their brief (p. 296): —

The first reason is, that,

> "inasmuch as Drawbaugh considered the invention to be of great value, *and the crowning work of his life*, and found himself unable to secure capital at present to patent and introduce it, and *did not wish to have it stolen from him*, nor to have it get into public use until patented, he may not have considered it wise to advertise it."

The second reason is that

> "it may have been omitted from the card by accident," "and, as both men were very poor, the mistake was never corrected by the issue of a new edition of the card."

The third is,

> "Drawbaugh, advertising for business jobs, and aware that even his sanity had been extensively questioned by reason of his work on the talking machines, and relying upon his personal efforts with capitalists to induce them to take hold of it, patent it, introduce it with capital sufficient to render the enterprise a success, and thus vindicate the soundness of his intellect and his judgment, may have deemed it wise not to include it in the advertised list. People who believed the talking machine an evidence of insanity might thereby have been deterred from bringing their work to him."

Mr. HILL. — Now please add to that, as you guess at reasons, that those are introduced as causes that might be at least as reasonable as those that you give.

Mr. DICKERSON. — I think his Honor understands it. That makes the three reasons. *First*, he didn't put it there because it would be stolen; *second*, because he forgot it; *third*, because he would be considered insane and would lose his jobs of work. What kind of a job would he lose? The principal jobs that he would lose, by the looks of that printed card, would be jobs of soliciting patents.

The COURT. — Do you say there was a second edition?

Mr. DICKERSON. — There was a second edition. Although Holsinger's testimony on that subject is not very decided, it is to the effect that there was a second edition; and Dan does not deny it.

Mr. HILL. — Might and might not have been.

The COURT. — Holsinger printed the card?

Mr. DICKERSON. — Yes; *and he had a newspaper there with Dan's solicitor-of-patents advertisement in it.*

Mr. HILL. — He had a little office there with a handful of type. The newspaper that they had there was about that long [*illustrating*].

Mr. STORROW. — He is the printer and publisher of a newspaper now and was before he went there.

Mr. HILL. — At this time he published what they call a newspaper, of which five or six numbers were printed, about so long and so wide [*illustrating*]. In 1875 and 1876 he was living at Milltown, and he swears that he saw those telephones all the time that he was there.

The COURT. — What telephones did he see before this card was printed?

Mr. HILL. —He saw *all alleged in our evidence to have been there*. He saw **D** and **E**, for instance.

Mr. DICKERSON. — Oh, yes! he filled the bill right full. There was nothing that *he* left out.

Mr. HILL — They called him as their witness as well as we.

Mr. DICKERSON. — We called him to prove writings which destroyed his deposition for the defence. Here is his answer: "I printed one hundred and fifty the *first time* and think we printed a *second lot of one hundred and fifty;* I am not positive as to the second lot." (Complts, ii, 1212.) That is his testimony. I think I do not overstate it.

Mr. Hill has very kindly interrupted me, and made a statement, for which I render him my thanks; he says that Holsinger knew all about the telephones. I will make a digression, and tell you about him and what he did know. He was not only the printer to print these things, but he was a literary gentleman, like Silas Wegg, and he corresponded with a country newspaper called the Carlisle *Mirror*, under the euphonious pseudonyme of "River Echo." One of our best pieces of work was to identify Mr. Holsinger with "River Echo." We put him on the stand, and he admitted that he was the man. Mr. River Echo, in the fall of 1875, wrote to that paper of his about Dan Drawbaugh (he probably called him Mr. Drawbaugh. I call him "Dan" for convenience; it is his familiar name in the record), — the letter is dated Nov. 16, 1875 (complts, ii, 1216; complts' brief, p. 201): —

> "We have the pleasure of announcing to the wide world that our Milltown (Eberly's Mills) has now the new axle factory established in the old machine shop at this place by a company of four live and energetic members, one of which is our friend, Wilson Bear, of Camp Hill, as the general business manager, and M. N. Grove, of Harrisburg, as corresponding secretary. They make the Kline conical, compensating axle, a new invention of Mr. Kline's, of Camp Hill. We wish them every success, for we think it is a very good improvement in that line.
>
> "ELECTRIC CLOCK WITHOUT A BATTERY IS BEING GOTTEN UP IN OUR TOWN BY DANIEL DRAWBAUGH, TO BE EXHIBITED AT THE CENTENNIAL NEXT FORTH. IT WILL BE ONE OF THE THINGS NOT DREAMT OF BY EVERY ONE, AND BE A CREDIT TO THE NATION, FOR ITS WONDERFUL SIMPLE WORKINGS AND GREAT CONVENIENCE."

Now, sir, they called this man to the stand, and he swore that Dan Drawbaugh was working at that time, — the fall of 1875, — day and night, on telephones, and *never worked on any other thing*, except it might be his *electric key*. *Specifically, that he never worked on another thing*, excepting it might be the electric key; at the very day and hour, sir, when he wrote that letter puffing Drawbaugh as the inventor of "the justly celebrated electric clock." That is frightful, but it is a fair sample of the swearing these people have been able to procure.

I am much obliged to you for the interruption which led me to it. That disposes of Holsinger.

The COURT. — What is meant by the magneto-electric machine on the card? What is said on that subject?

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The COURT. — What is meant by the magneto-electric machine on the card? What is said on that subject?

Mr. DICKERSON. — That is the "electric key," so called for short. That is the thing that occupies the great part of the card. I will tell you what it is for, because your Honor will find it is very interesting reading, presently. He says it is to be used for "short-line telegraphing."

The COURT. — Oh, yes! I see.

Mr. DICKERSON. — [*Reading from card:*]

"*For Fire Alarm* and Propelling Electric Clocks. It can be applied to any form of electric movement. Gives entire satisfaction, useing no galvanic battery. For simplicity it has no rival."

About one third of that card is occupied with that as the *great thing on it.*

The COURT. — That is what is termed in the testimony the "electric key."

Mr. DICKERSON. — Yes, sir; sometimes electric key, and sometimes magneto key or machine; sometimes the "signaller"; that is the contrivance which Mr. Hauck had got him leave to try on the telegraph line at Mechanicsburg, and which he afterwards took himself to Harrisburg, and exhibited there. I will mention that presently. Brief, p. 322.

Now I am just putting facts in here; a child can draw the conclusions; it does not require any argument.

"River-Echo" Holsinger did this swearing about Dan (defts, i, 381):

"*Q*. 45. From all you saw of Mr. Drawbaugh's operations and employment during the time that you lived at Eberly's Mills, what was he experimenting on principally?

"*A*. *The talking machine; he appeared to be crazy on it.* I often tried to get information from him on other subjects, and about a half a minute's talk would turn him right on the talking machine; that is about his standing, — the way he felt all the time I was there."

"X *Q*. 108. While you lived at Eberly's Mills, was not Drawbaugh capable of earning all he needed if he would only work steadily?

"*A*. Yes, sir; he did work steadily, intently, never lost one moment, but, *influenced by some supernatural or other power*, did not happen to work at such things as did or would bring him the required necessaries for the sustenance of himself and family.

"*X Q* 109. What things did he work at?

"*A*. He put a great deal of time in experimenting on his talking machine; in fact so near all his time that he got very little earned.

"*X Q.* 110. What other inventions was he working on during the three years and a quarter that you lived at Eberly's Mills?

"*A. I do not remember of anything that he was working on except a magneto electric machine;* but whether he worked on that as an invention while I was there, or only completing a former invention, I do not know. That is about the substance of what I know about his invention."

Dan Drawbaugh was telling the country folks that he was going to exhibit this electric clock at the Centennial, and he told Holsinger so, who published it. He had too much sense to go there with Bain's clock of 1840, of course. He knew he would be laughed out of the house; but he stuffed his rustics with it, while he was looking out for somebody to buy it; and he found somebody presently, and got their cash for it, and put it in his pocket. The molasses hadn't got sour yet.

There is one use of this "electric key" spoken of on that card which I will explain: This "fire alarm" that this electric key is to be used for is exactly the alarm box we have shown you here; it is used to ring a bell. I don't say that Dan's was shaped exactly like this one; it can be modified ten thousand ways. It is an old Wheatstone contrivance patented in 1848, just as well known in electric circles at that time as the full moon was (complts, ii, 1382). I don't mean to say but that Dan might have made one screw longer or one screw shorter, or hung the magnet nearer to one end or farther from the other. I am not talking about that. I am talking about the thing,—the *machine to make electricity* for the the purpose of signalling. Dan thought it would be a good thing to use on fire alarms in cities; to put one of these keys in each alarm box, and when a person opened the box and gave this magnet a shake. it would send a wave of electricity to the central station, and ring a bell; just as we do now on the telephone boxes when we call up the central station.

Now your Honor sees on that card it was for the purpose of *fire alarms;* but Dan was also wild about putting that key on telegraph lines. He was so ignorant as to suppose that the amount of electricity one could make by his finger would be of any use on a real telegraph line.

The COURT.— No battery?

Mr. Dickerson. — No battery; just a wabble of the magnet. What is got in electricity is the equivalent of the power expended by the finger in depressing the key with much loss however.

Mr. Hill.— I understand Prof. Siemens, then, was similarly ignorant. He had, as you say, invented this electric key: if one was ignorant, the other was.

Mr. Storrow. — He had something else.

Mr. Dickerson. — Yes, he had something else, and that was the Siemens armature.

Mr. Hill. — You don't know what Dan had.

Mr. Dickerson. — We do. He has described it himself. He testified, and he gave a description of it. It was a common horseshoe magnet, hung up on two pivots, that could wabble up and down.

Mr. Hill. — I have seen the motion: I know how it is; that's not exactly the motion.

Mr. Dickerson. — Well, we have your testimony already on other things: you had better not give any more of it here. We will stand upon the record, I think.

Mr. Hill. — He didn't describe it in the way you have described it.

The Court — Do the testimony and your proofs show a description of this machine?

Mr. Dickerson. — Yes, your Honor. Dan Drawbaugh describes it (defts, ii, 980-2, 984; complts i, 793).

Mr. Hill. — And right here I wish to call your Honor's attention to the testimony of Edward Nichols (p. 875, complts' record, x-q. 196 and answer), one of complainants' witnesses — the only one who testified as to the likeness or non-likeness of that machine to the instrument **C**. I think he is the only one who testified on the subject of any supposed resemblance to that exhibit **C**.

Mr. Storrow. — You will find another reference in the brief to the same topic (brief, p. 324).

Mr. Dickerson. — Any one who sees both will see they are generally alike. They have both got big horseshoe magnets with electro-magnets in front of the horseshoe; one has a diaphragm, which is not on the other. The question is, whether a country fellow who saw one ten years before might mistake the one for the other.

Mr. Hill. — He swears that nobody could mistake those two machines; that he would not take one for the other.*

Mr. Dickerson. — You don't suppose you could not get any number of men to swear to that, do you?

Mr. Hill. — He is your witness.

The Court. — His knowledge of mechanism would account for that.

Mr. Dickerson. — I didn't mean to argue such questions at all. I was telling you the big facts; no matter about these details. Dan Drawbaugh took that electric key up to Harrisburg to the superintendent of fire alarms, and put it on exhibition in a shop there, and

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*As the testimony of Edward Nichols was incorrectly stated, we give his answer referred to, and also the reference in the brief.

Deposition of *Isaac Lloyd*, a school teacher (complts, ii, 1269): —

"*Q.* 51. Please mention something about the construction of the instrument that you saw at the restaurant at Harrisburg for telegraphing without a battery.

"*A.* To the best of my knowledge, it was composed of two magnets — one a permanent one, and the other an electro-magnet — the permanent magnet was balanced on trunnions. The permanent magnet's poles, passing the poles of the electro-magnet, produced an induced current of electricity. This operated the sounder, or an equivalent. Attached to the machine, he had quite an amount of wire — copper, I think. The clicking was produced by pressing on the permanent magnet."

And then —

"*A.* 56. . . . If the magnet on 'C reproduced' was equipoised, it would look very much like the machine for telegraphing without a battery that I saw at Harrisburg. The permanent magnet had trunnions, upon which it was balanced. Its poles passed the poles of an electro-magnet. That machine had nothing like the diaphragm and mouthpiece of 'C reproduced.'"

Edward Nichols testified (complts, ii, 875): —

"*X Q.* 196. Please look at the instrument, Exhibit C reproduced, now shown you, and state whether this is not the instrument which you saw, instead of a call bell for hotels.

"*A.* It is not.

"*X Q.* 197. Could you not possibly be mistaken about it, and have confounded this instrument with the call-bell instrument?

"*A.* I could not; my recollection is very clear about that instrument.

"*X Q.* 198. Does this instrument look very unlike that call-bell instrument, or very like it?

"*A.* It does not look like it.

"*X Q.* 199. In your judgment, could anybody mistake the one for the other?

"*A.* *I could not.*"

They were much alike, though careful and educated men like Lloyd or observant mechanics like Nichols would not mistake them. What Nichols says is not that anybody could not mistake them, but that *he* could not.

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Mr. HILL. — He is your witness.

The COURT. — His knowledge of mechanism would account for that.

Mr. DICKERSON. — I didn't mean to argue such questions at all. I was telling you the big facts; no matter about these details. Dan Drawbaugh took that electric key up to Harrisburg to the superintendent of fire alarms, and put it on exhibition in a shop there, and had people looking at it; that is in the record. And then Mr. Hill, in his brief, says that the man who wrote that card *couldn't have been Drawbaugh*, because he had said that this key was for "fire alarm," and that *anybody knows* it could not be useful for that purpose.

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The defendants' brief, p. 293, says of this card: —

> "It was evidently written by Holsinger, and not by Drawbaugh, as appears . . . from the inaccurate description of the magneto-electric machine as a machine for 'fire alarm and propelling electric clocks,' with neither of which did it have anything to do, nor was it applicable to them in any way."

Mr. Hill. — It ought to be said that city telegraphs on that principle are in use now.

Mr. Dickerson. — There is not such a thing existing in the world.

Mr. Hill. — I can easily satisfy your Honor on that.

Mr. Dickerson. — I am not discussing that point. I have no doubt that you can put a magneto key on a wire and send a signal ten miles; but to talk about the use of it on practical telegraph lines is absurd. Dan had no idea of the immense electro-motive force required to do that. What electricity one can make with his fingers is of no more use there than it would be to whistle jigs to a milestone; yet, of course, a *signal* can be sent over short wires; and in every city they are doing it to-day, on all these telephone alarm boxes.

Mr. Hill. — Will you allow me to look at your card for one moment?

Mr. Dickerson. — Do you think it is a forgery? It gives me great pleasure to hand it to you.

Mr. Hill. — No, I do not think it is. [*Reading from card:*] "Magneto-electric machine, for *short-line* telegraphing."

Mr. Dickerson. — Of course it is for short-line telegraphing and for fire alarms. Its use for the fire alarm I am talking about.

Mr. Storrow. — Similar things were tried on lines years before and given up.

Mr. Dickerson. — And Dan put it on his card, and for fire alarms. That "fire alarm" is going to be very important soon, and that is the reason I now call your Honor's attention to it so particularly. This magneto-key question is stated in the brief, pp. 322–4.

Now, we have made our digression from Hauck, in 1873, and I will go back on the track of this genius as he marches from adversity to fame.

In 1875 was formed the Axle Company. The details and references are in the brief, pp. 259–266, 501–510. The articles of association were signed in the last of December, 1874, and the company went into operation in the spring of 1875. They went to Eberly's Mills because of Dan's fame as a machinist, in the spring of 1875; and out of the Axle Company I am going to DEMONSTRATE THE UTTER FALSITY OF THIS PRETENCE.

The Axle Company got their machinery in March or April, 1875, and began in that spring and summer to make patent axles, invented by a man named Kline; and they employed Dan as their master machinist, to run the works. Up to that same room — forty by twenty-five — the Axle Company, in order to segregate their work, put a staircase on the end of the building outside.

The COURT. — Did they succeed Hauck Brothers?

Mr. DICKERSON. — Yes, sir; they succeeded the Hauck Brothers, and went in in March or April, — somewhere along there, — in 1875, having formed their partnership in December, 1874.

It was composed of four persons: Kline, the inventor of the axle; Capt. Moore, the capitalist; Grove and Bear, — four men.

Capt. Moore was the only man who had any money in the concern, as it seems. Capt. Moore was a very intelligent man. He is one of the only two men of education that have got on their side — I mean above the class of people that work with their hands for a living — almost that. That may not be strictly true, but it is substantially true. Certainly they are the only two witnesses of any importance who belong to the category I have mentioned.

That company went there because of Dan's reputation as a machinist. He drew for a long ways around him. They went there and put in their machinery in his upper story, and then built their staircase from outside, so that they would not be required to go through the lower story, which was used by the Haucks. The Haucks at that time had left their machinery there unused; and they kept moving it from time to time. They got out of business practically in 1875, and they moved their machinery to another place; but some of their machinery was left up to 1877, I should think, although they were practically out of business. The molasses-spigot business, or the rotary-pump business, was a failure, and they were just getting their things out.

This new Axle Company went up to the second story, which was Dan's own shop, where his own machinery was, and where his own personal room was, — a twelve-foot room; and they put a staircase up at the end of the building and made an entryway between the two rooms.

The COURT. — I remember the sketch. (App. p. 886.)

Mr. DICKERSON. — There were two small rooms, with an entryway between them, and the rest of the floor was all one, and the staircase was all outside. That came into existence in the spring of 1875, that particular structure; and it nails down several of their witnesses, who swore to seeing telephones in those particular rooms before the time when they were made. That is a stumbling block that trips up several of their witnesses, or more than one; I am not going to use extravagant terms. That was put there in 1875.

Mr. HILL. — It tripped up Mr. Bayler, for example.

Mr. DICKERSON. — *Yes, it did trip up Bayler*, it did just that to Bayler; but I am not going to stop and pick him up. He is microscopic. I am going to a subject that is big.

Now, sir, at that time, — in the spring of 1875, *according to the testimony*, — Drawbaugh had **D** and **E**, a pair of perfect Bell magnetos, according to both Bell's patents of 1876 and 1877. He had **D** and **E** in February and January, 1875. That is the testimony. Of course he had all the antecedents of **D** and **E**, — **C** and **I** and **A** and **F** and **B**; but he had **D** and **E**, and that was the culminating point of Dan's work on magneto telephones.

D and **E**, your Honor knows, contain all the inventions Mr. Bell made on telephones, excepting his variable-resistance transmitter, which is another way of carrying out his invention. But all his magneto-telephones are summed up in **D** and **E**. They are the same thing as this black-handled machine, which is now in common use. The only difference between them is that the black-handled machine has a long permanent magnet in the handle, and **D** and **E**

have got it curled up flat. The difference is one merely of convenience in handling one or the other, and in **D** and **E** it is too small.

Therefore, your Honor, in the Axle Company's room, or in that compartment of it in which Drawbaugh had his own tools in the corner, were all these things from **D** and **E** backwards, — **D** and **E** and **A** and **C** and **I** and **B** and **F.** Not only were they all there, but they have got a fellow to swear that the place was strung full of them, — a man named Decker, — piled up all around, like a harp with a thousand strings. Every time he went to that room in 1875, — to that Axle Company's shop, — there were more and more and more, and better and better, and Dan had them strung all around the room with wires to the cellar.

And now I will make your Honor acquainted with Capt. Moore. If he doesn't crush this case into impalpable powder, it never can be done by logic. Capt. Moore was an intelligent man. He was a teacher of a school, — a soldiers' orphan school, — which is assisted by the State, and which was owned by Capt. Moore — a man of intelligence and a man of integrity, a man against whom I have nothing on earth to say; and I should have called him as our witness if I had known what he could swear to, and the other side had not already called him.

Capt. Moore began business at Drawbaugh's shop in March or April, 1875, and stayed there until after November, 1876. He sold out his school and put his money into axles, relying upon Dan's skill in carrying out his work. *He* got stuck on the molasses too.

Mr. Hill. — Where is that testimony about his leaving his school? I don't remember about his selling out his school.

Mr. Storrow. — It is on p. 653 of defendants' Vol. I.

Mr. Dickerson. — Why on earth do you want to refer to that? But read it, Brother Storrow.

Mr. Storrow. — (*Reading:*) Moore's deposition, defts, i, 653: —

"I assumed control of it [the school] Nov. 1, 1867. The building belongs to me, and the State pays me a certain sum *per capita* for all expenses attending the maintenance and instruction of the scholars. From March 1, 1875, to March 1, 1877, I sold my controlling interest to another party, and resumed it again at the latter date."

Now, sir, Capt. Moore went to Drawbaugh's shop in the spring of 1875, and stayed there until Nov. 18, and somewhat after — certainly to Nov. 18, 1876. That is the date of the final dissolution of his firm. Our patent is March 7, 1876. He was the capitalist. He left his school, and went there to devote himself to making Kline axles, with Dan Drawbaugh as his machinist and employé.

But, your Honor, the present testimony is, as you see, that the culminating point on magnetos had been reached in 1875 — January or February, by **D** and **E**; also that those things never went out of that room. They were all there. Capt. Moore was in profound sympathy with Dan. He is the brother-in-law of Bowman, one of their principal men in getting their proofs; and you will find that his testimony was given in deep sympathy with the whole crowd. Whatever he swore to he swore to *as well as he could for Dan.*

Mr. Hill. — The brother-in-law of Bowman, did you say?

Mr. Dickerson. — Yes; the brother-in-law of Bowman.

Mr. Hill. — Bowman is the justice of the peace who swore some of the witnesses.

Mr. Dickerson. — Well, you had him travelling around the country with you taking testimony, — taking *ex parte* affidavits.

I want your Honor's careful attention to this, for it demolishes this case, in my judgment, as effectually as if it never existed. If it doesn't, then "judgment has fled to brutish beasts and men have lost their reason."

Will your Honor be good enough to turn to defts, i, 650, where they called Capt. Moore to prove that Dan Drawbaugh applied *to him for money to patent his invention.* He is one of the persons who refused Dan when he was begging for money; and they called him to prove it. At the top of that page (650) he says, — look at that question, your Honor: —

"*Q.* 22. *About when was it, as near as you can remember*, that he first showed you his *talking machine?*"

Now, of course, they had been talking to this witness, and had prepared him; and the best question they had to ask him was, "*About when . . . as near as you can remember?*" That is all the criticism I care to make upon any answer of his that relates to time.

"*A.* It was during the month of May, 1875.

"*Q.* 23. Did he say anything about patenting the machine at that time; if so, what?

"*A.* He did; he said that he was unable to procure a patent himself, and desired me to go in with him and get a patent for it.

"*Q.* 24. Did he offer an interest in the invention to any one who would go in and get a patent?

"*A.* Yes; he was anxious to have some one take hold of it with him who had the means to procure a patent and put it on the market; I was so fully engrossed with our own patent," and so on.

"*Q.* 25. At that conversation with Mr. Drawbaugh, *did he or not suggest any particular line of business in which he thought the talking machines could be introduced?*

"*A.* HE SPOKE OF THE USE OF IT IN CITIES TO SUPERSEDE THE FIRE ALARM WHICH EXISTED AT THAT DAY."

That answer and that question are certain death, — "He spoke of the use of it in cities *to supersede the fire alarm which existed at that day.*" There is Dan's card of the year before advertising this "magneto key" to supersede the fire alarm; there is the testimony of Mr. Kiefer that Dan came to Harrisburg to get him to introduce it on the fire alarm. And then, may it please your Honor, Dan Drawbaugh isn't an idiot; he didn't tell a man that a telephone was a "*fire alarm*"; for a talking machine requires a fire alarm alongside of it to alarm the listener. Dan's fire-alarm key is always placed along with it to attract the attention of anybody that is going to use it, without which it would be useless. For the key, see brief, p. 322.

Isn't it certain as death that the thing he asked Capt. Moore to invest his money in was the fire-alarm key that he had been begging around the country to get used, and to get advertised? Of course it is. I suppose no one in his senses will argue that that *tin can* was going to be a fire alarm, or that Dan said so. Capt. Moore, five years after the event, simply doesn't remember the *thing* on which Dan applied to him for aid; he, however, did not forget *the purpose* of the thing, and that does not fit the telephone. But let us go on. Here, sir, is their next question to Capt. Moore. I beg your Honor's attention to it now, because this is a critical and fatal question which they put to him: —

"*Q.* 26. Please look at the machine **B**" [that is the old tin can of 1867, as they say], "now shown you, and state whether or not he showed you *that machine* IN CONNECTION WITH THAT CONVERSATION."

They don't ask whether he showed it to him *as the thing* that was going to *supersede the fire alarm*, but only "*in connection with that conversation.*"

"*A*. I believe this to be the exact machine which he showed me *during that conversation*."

That was adroit. Now, your Honor, consider that question. Dan says to Capt. Moore, "Look at **B**. Isn't that the thing I showed you?" He himself knew whether it was or not, and he put the fact to the witness and asked him to assent to it, and he did: "Yes, **B** was the thing."

Now, may it please your Honor, at that time Dan had **D** and **E**, a *perfect Bell telephone*, and all these antecedent things, if this present story be true. He was applying to Capt. Moore, according to the present theory, to help him patent the telephone; and what did he show him? He showed him that old *tin can*, which they want you to believe had been made in 1867, and which Dan Drawbaugh has since sworn had been *given up, and had gone out of use years before that day*,—years before that day,—gone out of use as soon as he had made a better one; and yet he showed that to this man as the basis of an application for money to obtain a patent for the speaking telephone in 1875-6.

I haven't done with them yet, sir. Capt. Moore says, "I believe this to be *the exact machine* which he showed me *during that conversation*."

"*Q*. 27. Do you recollect whether or not the end of the box next to the magnet was closed at the time of that conversation?

"*A*. *It was closed with something thin, like a bladder, drawn tightly and tied around it like a drumhead.*"

That is, it was in working condition with the bladder on. That bladder, may it please your Honor, Drawbaugh said when he swore about this **B**, had been eaten off years before in the garret, and never had been put on again.

Mr. Hill.—No, he doesn't say anything of the kind. Take Mr. Drawbaugh's testimony throughout his deposition and read it.*

Mr. Dickerson. — [*Continuing to read:*]

"*Q*. 28. Do you remember whether or not, while you were engaged in business there, he had *other talking machines around in different parts of the shop?*

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* See the deposition on this point quoted in complainants' brief, pp. 154-5.

"*A.* *I never saw any in use.* I saw a number of pieces of wood that were carved out in different shapes. I never had any conversation with him as to their use.

"*Q.* 29. Did you feel much interest *in his talking machine* at the time?

"*A.* I did feel considerably interested in it, and told him if it could be put to practical use it would be a fortune to any person or persons who would succeed in bringing it out. I can't remember the words exactly, but that is about what I said to him.

"*Q.* 30. Did you take interest enough in it to inquire about it afterwards, or to examine any of the machines that you saw lying about there?

"*A.* I observed him frequently working at machinery that I thought was connected with this same machine, though put up in different styles and different shapes. I was not well enough acquainted with his objects at which he was at work, nor his designs, at the time, to give an intelligible account of their working, or what they were for. *I made inquiry of him as to the purpose of a machine that was on a table in another room, which worked by a magnet, and pressed certain keys with the alphabet on,"* — that was the alphabet telegraph, your Honor, — "but I don't know the object of it now; I didn't examine any one that had reference to this talking machine."

"*Q.* 31. Are you now able to identify any of the machines that had reference to this talking machine, other than the instrument **B** now lying on the table before you?

"*A.* I do not think I could recognize any other.

"*Q.* 32. When Drawbaugh *spoke of using the talking machine* as a substitute for the fire-alarm telegraph, did he state how he thought of using the machine," — look now at this question — it is certain death, — "whether by batteries or by magneto electricity?

"*A.* He spoke of using it as this was used, *by an electro-magnet; this is the expression I understood him to use, — magnets.*"

Mr HILL. — There was an electro-magnet on the machine.

Mr. DICKERSON. — Isn't this as certain as death — that Drawbaugh talked to Moore about his *key* as the subject of his application — the key that was to work by a magnet without a battery, and to be used for a fire alarm? Capt. Moore is an honest man. I believe he meant to tell the truth. But Drawbaugh showed him **B**. When did he show him **B**? When? Was it in May, 1875? He doesn't say so. "I want you to guess, as near as you can, when you saw it." That is all they asked him. But, whenever it was, there was *no talking through any machine* in Capt. Moore's presence; and yet, long before he left that place, even as early as August, 1876, Dan had not only

D and **E**, but the "Blake transmitter" in that room,—if the present testimony is to be believed,—and never showed any of them to Capt. Moore, his friend and employer, to whom he was applying for $50—only $50—to get a patent on his telephone; and before Capt. Moore left there, Bell was famous all over the world.

Now, sir, I will show you presently when **B** came into existence. *It came into existence in* 1876, *when Capt. Moore was there.* But Dan didn't talk through any machine to the man to whom he was applying for money to patent it when he had **D** and **E** on the table, which needed no battery, which he could pick up and connect the wire across the room and talk through them, if you believe him. Isn't it as certain as any moral certainty that at that day and hour he had no talking machine that he could show Capt. Moore? He had no talking machine, or he would have talked through it. He didn't have **D** and **E**.

Now, may it please your Honor, I might concede for the purpose of the argument that he showed Capt. Moore that tin can as early as May, 1875, and isn't their case gone? That is all he had in May, 1875,—all he had to show. But he had **B** at *some time* when Capt. Moore was there. When the partners went to Capt. Moore and raked up his memory, he remembered what the object of Dan's solicitation was—to supersede the fire alarm. He also remembered the tin can; he remembered the alphabet telegraph,—those things he remembered. He remembered that Dan asked him for money for *something*, and he describes what *that something* was to do; which shows it was not a talking machine; evidently it was the key, because he describes what it was exactly,—it was to supersede the fire alarm. That is what he talked about the money for.

Now, may it please your Honor, I will do Capt. Moore the justice to say that he does not fix the date of any of these things. If **B** was there at any time when he was there, his testimony is perfectly consistent and straight, and it demolishes this defence,—it gives the lie to their story. There is the card; there is the fire alarm; there is the application in Harrisburg to have the key put upon the fire alarm of that city; there is Capt. Moore.

That conversation with Dan must have occurred in 1875 or 1876. When did he testify? Five or six years afterwards. No man can tell whether it was in the month of one May or in the month of next

May— five or six years after — when he heard a man say such a thing; nor does Capt. Moore attempt to fix it. I think it is not necessary to argue that: our every-day experience proves it to ourselves. I can't, — your Honor can't, — and nobody can. Given the scope of that year for the captain to have seen those things in, and this case is demolished beyond the power of the resurrection horn to raise it.

D and **E** were not in that room. None of those other things were in that room; none of them, sir. Capt. Moore didn't talk with Dan through any of them when Dan went to him to get money. Dan said to him, "I want to supersede the fire alarm, and here is the machine that will do it." Capt. Moore said, "No, I don't want to go into that business." That is the story and it is true. Imagine a man of Capt. Moore's intelligence shown, in 1875, *the perfect Bell telephone of to day*, and not speaking in it!

I am going to fortify Capt. Moore's story by several witnesses on both sides. But if his story stood alone and I sat down now, I should feel the most absolute confidence that the defence was dead on the testimony of Capt. Moore. That was Dan's own question,— "*Didn't I show you* **B** *with a bladder on?*" That was his own assertion, — that he never showed Capt. Moore any other. And that tin can Dan *swore he never used after he got it superseded by the improved receivers* **C** *and* **I**, as, of course, he never did. Why should a man use a battered tin can and a piece of old board, when he had got the *same machine exactly in a perfected and improved form*, which he swore was much better than **B**, — Dan swore it was much better than **B**, and that, when he got it, he no longer used **B**, of course? He said that he *showed* it to people sometimes; merely to show what he had done; that he brought it down from the garret with the bladder eaten off, and *showed* it to them, but that he never *used* it. (Brief, pp. 153–5.)

Now, may it please your Honor, this is their witness, — *their witness.*

But I will go a little further, sir. They put a man by the name of Springer on the stand.

This man Springer testifies (defts, i, 190): —

"*Q.* 2. Do you know Daniel Drawbaugh?
"*A.* I do,"—and so on,—"I have known him about eight years."

"*Q*. 3. Did you, at one time, reside at Eberly's Mills?" This is their witness, not ours.

"*A*. I commenced there *April 1, 1876*, and moved away about the 6th or 7th of January, 1877." He was there during the critical year, during the great exhibition year. "I just rented a shop and went there to work, boarded myself and lived there; my family stayed at Andersontown.

"*Q*. 4. While so living at Eberly's Mills, did you or not frequently visit the shop of Daniel Drawbaugh?

"*A*. Yes, sir; *about twice a day, noon and evening*."

"*Q*. 5. During that time did you see there what he called a talking machine?

"*A*. Yes, sir; that is what caused me to go down there pretty much every time I went.

"*Q*. 6. Did you go down to assist him about talking on it or operating it?

"*A*. He boarded with his brother just above me." (Your Honor will remember that in that year, 1876, Dan had moved his family up to Mechanicsburg, six miles off, and came down to his shop by rail, and went to his brother's for his meals.) "And he stopped still after dinner, and I said, I will go along down and we will talk through that machine. *I told him it was a curiosity to me*."—I should say it might be, your Honor.—"I wanted to talk with him through it."

"*Q*. 7. During the time that you lived there, as you have stated, did you see more than one talking machine? If so, how many, to the best of your recollection?

"*A*. I saw these six that lays here (*indicating* **B**, **F**, **D**, **E**, **G** *and* **O**); *these two are the first we talked through* (*indicating* **B** *and* **F**)." "These two are the first we talked through."—He went there April, 1876. These two, **B** *and* **F**, *were the tin can and the broken tumbler*.

"*Q*. 8. How soon after you talked through **B** and **F** did you talk through any of these other four," and so on.

"*A*. *It was about two months*, or as near as I can tell you, that he *had these two*, **D** and **E**."

For two months, your Honor, Dan and Springer talked through the *tin can and broken tumbler* after April 1, 1876; and the tin can and broken tumbler were the instruments of 1867 which had been superseded long years before, as Dan himself swears, but which now appeared in working order—**B** alone, by the testimony of Capt. Moore, their witness, and **B** and **F** by the testimony of Springer, their witness.

Springer's testimony, on the whole, is not true, but he is their witness; they proved by him that Dan and he talked through **B** and

F from April to June, 1876, morning, noon and night, and then what happened? Then **D** and **E** emerged. This witness is, of course, one of those animals that has been stuffed for this case; but they did not stuff him right. He was an early witness before their schedules were all made out.

"*A*. 8. It was about two months, or, as near as I can tell you, that he had these two, **D** and **E**, or two exactly like them; *he told me then that he had improved the machine; that he could talk both ways then.* Then I went along down; the first we had we could only use to talk in one direction."

Here in the summer of 1876, after our patent, first appeared something to supersede **B**, the tin can. That was **D** and **E**, says the witness, which, they had attempted to prove by some other witnesses, *were made in January*, 1875. They were not there when this man went there; they appeared afterwards. And then they put **A** to him,—that round thing with the mouthpiece at one side. "Did you see that?" "No," says he, "*he must have got that after I left;* I don't mind of seeing it" (ans. 33, defts, i, 193). Now that is their other witness.

Mr. Hill.—Will you read this witness's answer 64, p. 197?

Mr. Dickerson.—Yes, sir, I will read anything you say. I always find it advantageous.

The Court.—I don't think it advisable to take time to read it, if the proof is referred to in your brief.

Mr. Dickerson.—But I always like to gratify Mr. Hill, you know.

The Court.—Of course, I understand that Mr. Dickerson takes up the record and makes the suggestions that are desirable for him to make in the way of argument.

Mr. Hill.—I beg your Honor's pardon for making any interruption at all, but, when the testimony of the witness *is not correctly* quoted, I think it worth while to call your Honor's attention to it.

Mr. Storrow.—That particular answer is quoted in our brief.

Mr. Dickerson.—Since we are charged with misstatement, I am going to read it (defts, i, 197):—

"*Q*. 64. Do you remember *their appearance* when you first saw them, and if so, did they look as if *they had just been made, or as if they had been made some time?*

"*A. They looked about as old as they do now; as if they had been made a long while. I am satisfied they were not made new.*"

That is, D and E, when he first saw them he thinks *looked* old.

The partners were in trouble, with D and E *just coming into existence in midsummer, 1876!* and Mr. Hill says to him at *the next session*, "Now, my good fellow, this won't do. Didn't they look just as old as they do now?" "Yes, just as old."

That is what Mr. Hill wanted me to read, and I read it to your Honor with pleasure: it was the best they could think of.

Now, sir, at that day and hour, — *August*, 1876, *we are talking about*, to which Springer had testified, — what did Dan have there, if the present story is true? He had the "Blake transmitter" and a number of antecedent microphones. Aug. 15, 1876, he had the "Blake transmitter" H finished. They have sworn to it solid, and they have put it in their brief that it was so. It was the high-water mark, Aug. 15, 1876, when Dan had the Blake transmitter. They also had these half dozen microphones, and they tell your Honor (and they tell you truly) that the inventions contained in those instruments are the inventions that were made *by a "hundred men"*; and Mr. Hill, on his feet here, told your Honor, with that satisfaction which any man naturally would feel if the fact were so, that his partner in a few weeks had created out of the recesses of his own brain a set of inventions that had taken a hundred other men, independently of him, to make, and which were the most startling, — he has had it so sworn by his attorney witness, — the most startling that have ever been made. What a pleasure it must be to him to contemplate in his embrace a genius like that! He told your Honor that his partner had done it all; and he evidently prided himself that he even lived in the shadow of so great a being.

Now, sir, Dan had those things, according to this testimony, when this man Springer was there; and yet they were talking two months through the old tomato can; and then D and E appeared, — and he never saw the Blake transmitter H nor A, — he says he didn't; and it was all within a room forty by twenty-five. And yet another witness, Decker, comes and tells you that that very room was strung over with them, piled up all around the wall.

But I haven't quite finished with them yet. There is a man named

Dellinger, whom they put upon the stand. There must be some mistake about the way he spells his name; it ought to be spelled Derringer: that is a kind of tool that is certain death to anybody it is aimed at. They put this man on the stand; and he is another fellow that went in there in 1876. (Dellinger's testimony, defts, i, 459.)

Your Honor remembers that **D** and **E** have got the "curled magnets" in them. (See brief, pp. 454, 471, 479.)

Mr. Hill. — And several other later machines have also.

Mr. Dickerson. — I like to have that issue made here. I am glad of it. Thank you again. Several other machines, Dan's partner says, have curled magnets. I am much obliged to him. I shouldn't have made it so emphatic otherwise.

Mr. Hill. — Several other *later* machines, I said.

Mr. Dickerson. — I don't care which way you put it, later or earlier, it suits me equally. *There are not "curled magnets," or anything like them in any later machine.* But your witness Dellinger fixes it (defts, i, 471): —

"*X Q*. 136. What instruments did you see him work on?"
"*A*. I seen him work on woodwork and on *these* curled magnets (*taking up* **D**)."

He went there, your Honor, in the spring of 1876, and stayed there until April, 1881, after we began to take testimony in this case.

Mr. Hill. — He was the miller in the grist mill.

Mr. Dickerson. — Yes; he is one of the kind of witnesses you have got, — these visitors. But let us hear Dellinger: —

"X *Q*. 133. In your forty-fifth answer you say, 'His whole heart and desire was on the telephone': what made you think his whole heart and desire was on the telephone?
"*A*. Because he always talked to me about it, and experimented on it.
"X *Q*. 134. Were you with him when he was experimenting or working on the instruments?
"*A*. I was in the shop.
"*X Q*. 135. Did you see him experimenting with them or working on them?
"*A*. I seen him work on them, — not experiment, but work on them.
"*X Q*. 136. What instruments did you see him work on?
"*A*. I seen him work on woodwork, and on *these curled magnets*

[*taking up* **D**] also on these wires. He had a machine that he was working on that was putting thread or something on the wires; I don't know what it was.

"*X Q*. 137. When was it that you saw him working on the curled magnets?

"*A*. THAT I AM NOT ABLE TO SAY.

"*X Q*. 138. Can't you tell whether *it was during the first year*, 1876, *or some of the later years?*

"*A*. I DON'T REMEMBER.

"X *Q*. 139. Do you remember *what he was doing on the curled magnets?*

"*A*. *He was working on them with a file, if I mistake not; he had a tool, anyhow, that he was working with.*

"*X Q*. 140. Did you see what he did with them after he had done working on them?

"*A*. *He fitted them into the wooden boxes here, on* THIS PIVOT [*illustrating with machine* **E**]."

They were screwed down on their pivots, — those curled magnets, — **D** and **E**, — *no other machines* are so made. It was after he went there, 1876, how many years after, he don't know, when he saw Dan filing and fitting up that curled magnet. I am happy to have that suggestion from Mr. Hill, because it emphasizes the witness,— not some other curled magnet on some other machine, *but this one here*, **D** *and* **E**; and Dan was screwing it fast *on that pivot*. "I saw him do it." That is their witness. Will they ask your Honor to turn him out of court, and say he doesn't tell the truth? They must not ask you to do that. His testimony is true. Dan was doing that in 1878.

Now, may it please your Honor, Dan Drawbaugh swore about this, and I think it is the only answer in his deposition that is absolute, double twisted and clinched on the other side. Almost every other answer he ever made is, "I don't know; my memory is bad; I can't tell; it might be so or it might not; I don't know anything about it. I am a poor wretch, that don't know anything." But here he came up to the mark, because he thought he could say something good. He wanted to fix **D** and **E**, not as *experiments*, but as perfected, unaltered things.

They asked him the direct question (defts, ii, 1107): —

"*Q*. 1700. State whether or not you *ever changed the magnets or electro-magnets on the small magneto instruments and* **E** *after their construction*."

They didn't want to see those things ever go to pieces again; their witnesses swore them back to January and February, 1875, — *although Drawbaugh never did or would*, — and they didn't want to see them ever go apart again. It was the first practical machine Dan ever had, and they must hold on to it.

What did the virtuous Dan say?

> "*A.* No, sir; I did not. *I know I did not on them. I am positive I did not;*" — twisted it up three times and riveted it,— "I had made some little changes in diaphragms,— sometimes thicker and sometimes thinner diaphragms, — and I had made the interior larger,— turned out a recess in one of the instruments; *that is all the change I can remember of.*"

Now he riveted it in, swore it solid, because it was necessary; and *after* 1876, — how many years after the witness can't tell, — they prove by Dellinger that Dan was filing, and finishing, and fitting up and putting in those curled magnets into their boxes (see brief, p. 495).

That dispensation of Providence that I mentioned in the early part of my argument; how it appears every moment!

Now, may it please your Honor, I am going to show you where all this came from. In 1876 Dan Drawbaugh was living at Mechanicsburg, as I have mentioned to you, having gone there on the first day of April of that year, 1876, and having returned to Eberly's Mills on the first day of April, 1877. In Mechanicsburg was a man named Shapley, a clock maker by trade, and a very intelligent man, as your Honor will see when you read his deposition. Dan was trying to get him into that wonderful clock of his; and he did, too. The molasses stuck him. He didn't know anything about electricity, but he thought it would be a great thing to get a clock that would never want winding: and Dan was hanging around him to get his money. He had two thousand dollars in cash, just lying loose, that he wanted to put into something. He was an enterprising fellow, a good mechanic, and Dan nosed that money out and went for it.

Mr. Shapley was a subscriber to the *Scientific American*, which he says Dan Drawbaugh read in his shop constantly. *On the ninth day of September*, 1876, appeared an article in the *Scientific American*. It is the other side's exhibit. I think they call it Vol. IV., defendants' exhibits, p. 131. If you will be good enough to look at it, you will find it good reading: —

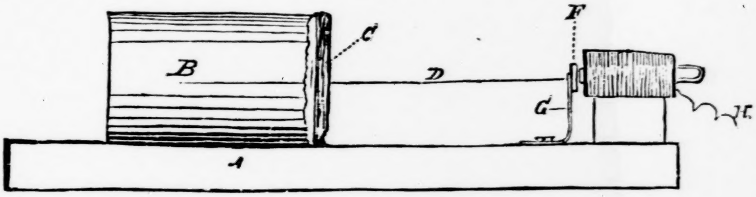
> "Several weeks ago we gave a sketch and description of the thread telegraph, consisting of two small tin or wooden cylinders, *each having a membrane stretched over one end, the two membranes connected by a stout thread.* Two persons may readily communicate the sounds of the voice by means of these instruments over a thread fifty or a hundred feet in length. The person sending speaks within one of the cylinders, which causes the membrane to vibrate; the vibration passes along the stretched thread to the membrane of the other cylinder, which being held to the ear of the person receiving the message, the vibration is duly heard, or, in other words, the voice of the sender is made audible."

This is an introduction to an absurd description of the Bell telephone. The chucklehead who wrote it didn't know anything about his subject: —

> "Prof. Graham Bell, by a *device somewhat analogous*" — that is good — "has succeeded in transmitting the tones of the human voice by telegraph. *Instead of the thread, he connects the membranes of the* TWO CYLINDERS OR DRUMS *with the armatures of the electro-magnets*, one drum being placed at each end of the telegraph wire. In fact, he not long ago demonstrated the possibility of conveying vocal sounds by means of the ordinary telegraph wires and special appliances for transmitting and receiving the sounds. The apparatus used by Prof. Bell is thus described: two single-pole electro-magnets, each having a resistance of ten ohms, were arranged in circuit with a battery of five carbon elements, the total resistance being about twenty-five ohms. *A drumhead of gold-beaters' skin about two and three quarters inches in diameter was placed in front of each electro-magnet, and a circular piece of clock spring was glued to the middle of the membrane of each drumhead.* One of these telephones was placed in the experimental room and the other in the basement of an adjoining house. Upon singing into the telephone, the sounds of the voice were reproduced by the instrument in the distant room; and if two persons simultaneously, the two notes were audible at the other telephone," and so on.

That is all I want to read about it. It is an absurd description of Bell's invention; but it is a description of *two tin cans*, in which the string of the ordinary lovers' telegraph, as it used to be called, was substituted by a wire; and I ask your attention at p. 131 to this very inaccurate but very suggestive language: "*Instead of the thread, he connects the membranes of the two cylinders or drums with the* *armatures of the electro-magnets.*" That is a very stupid description; but it gives the idea that the thread is used to connect the armature to the drum.

Now, sir, in defts' proofs, Vol. II. p. 794, is the picture that Dan put in as his first experiment.



Look at that thing. There is the tin can **B**; there is the drumhead upon it; there is the string; there is the armature of the electro magnet, connected to the drumhead by the string, as suggested in the article. That is the first thing he did; but there was no sense in using that string,— it evidently came out of the *Scientific American.* He had that *Scientific American* in September, and I will show you when he first produced the tin can in public.

Dan says the first thing he did was this string thing. Our witnesses never saw that; but he says so, and I suppose it is true, — it is a plain suggestion in the paper; but no one would keep it long. He would omit the string and attach the armature directly to the bladder. At that time Dan was drawing Shapley into his net, and Shapley went down with him to his place to see his clock, and he was there in the first week of October, 1876 (complts, i, 588).

Dan had the *Scientific American* of September, 1876, giving an incorrect account of the Bell telephone, but describing it as two *tin cans* with diaphragms on them, and magnets. Dan was then negotiating with Shapley to get his two thousand dollars for his wonderful clock; and Shapley had given him these newspapers. He was frequently at Shapley's shop, reading these papers. Dan had one or more of these wonderful clocks at his shop, and Mr. Shapley went down to see them; because he was not going to buy a pig in a poke, and he travelled five or six miles from his own shop, in the town where he and Dan lived, to Dan's shop, at Eberly's Mills (brief, p. 203).

On the 3d of October, 1876, Mr. Shapley and Dan Drawbaugh went down from Mechanicsburg to Dan's shop to see the clocks, and then Dan showed him that tin can **B**, which he identifies and has described (complts, i, 589): —

"*Q*. 22. Can you name any other machines which he showed you at that time?

"*A*. We saw several bells which were rung by electricity, and *an alphabetical telegraph and an instrument he called a telephone.*

"*Q*. 23. Where was this instrument he called a telephone, and how came he to show it to you?

"*A*. The instrument was lying on a table near the clock, in the same room.

"*Q*. 24. Can you give any description of this instrument as you saw it on that occasion?

"*A*. I suppose the board might have been twelve or fourteen inches long, by about five inches wide, and an inch thick, with a *tin can* on about three inches in length, and perhaps two inches and a half in diameter, fastened to the board with a band. The can was lined with plaster of paris, and had *a membrane over it* and *an electro-magnet* to it.

"*Q*. 25. Was it connected with any other instrument, or with the table or building, in any way?

"*A*. Not at the time I saw it.

"*Q*. 26. What, if anything, did Mr. Drawbaugh say about this instrument when he showed it to you?

"*A*. I understood Mr. Drawbaugh to say that he had it up around the shop.

"*Q*. 27. Were there any wires connected to it at the time you saw it at that visit?

"*A*. There was not.

"*Q*. 28. Did he say anything to you about any use that he had made of it, or about what use might thereafter be made?

"*A*. I think I understood Mr. Drawbaugh to say that they had spoken with it, but I do not remember that he made any remark about any use that should be thereafter made of it.

"*Q* 29. Will you look at the instruments now on the table before you marked **F**, **B**, **D**, **E** and **A**, and state whether you recognize either of them as being the instrument that he showed you at that time, or like it?

"*A*. This is it (taking up instrument **B**). I recognize it as being like the one I saw; I do not remember of seeing **A** nor **D** and **E**; I don't really remember of seeing **F**.

"*Q*. 30. State whether or not Mr. Drawbaugh said anything to you about having any other instrument which he called a telephone, except the instrument you have already described, or whether you saw any other instrument there which he called a telephone?

"*A.* I do not remember that he said he had any other, nor do I remember seeing any other."

"*Q.* 41. Did you, at any subsequent visit, see the instrument marked **B**, or either of the other instruments to which your attention has been called?

"*A.* I think I saw this instrument, **B**; it was lying, I think, at the same place. I did not see any others that I recollect."

Now there, in the month of October, 1876, Dan had got the *Scientific American* containing the "tin-can" description of the Bell telephone, and he was negotiating with Mr. Shapley for his money. Mr. Shapley went down to his shop and saw this thing; but Dan never said to Mr. Shapley, "Here is a thing I have invented, and I want you to go into it with me." He showed it to him as a "*telephone*," an invention that had at that time been published not only in the *Scientific American*, but largely everywhere in the world.

Let us turn to Mr. I. D. Landis, the person who was with Mr. Shapley. He was Shapley's companion on that occasion, and also himself a clock maker. He testifies (complts, i, 609) : —

"*Q.* 28. Will you describe as well as you are able the telephone which he showed you? State where it was, and what Mr. Drawbaugh said with relation to it.

"*A.* It was in a room to the left on entering his place by the stairway, nearly opposite the door going into the room. My recollection of it is as being made of tin, — apparently a tin can, — with *a piece of bladder across the end* of it, with a magnet attached to it in front of the bladder; and also that he said, in calling our attention to it, that this *was to revolutionize the world*, or words to that effect; that it was for the purpose of speaking through, — carrying the sound of the voice.

"*Q.* 29. Was that instrument connected in any way with any other instrument, so far as you could see, or with the building?

"*A.* No, sir; it was not in working order at the time."

There was the reproduced thing from the description in the *Scientific American*, *with the string omitted*, and Dan said to these gentlemen, "*this is to revolutionize the world.*" That, at that time, may it please your Honor, was the talk from the great Centennial Exhibition, which had occurred some months before this interview, when the telephone first broke upon mankind; and he was now reproducing the thing and the talk out of that *Scientific American*. He did not say that he had invented it; or that he had any claim upon it; or that he had made it before; or that he wanted them to put any money into it. He merely pointed it out as he would a thing with which they might be familiar, having read the account of it in the *Scientific American*.

But, sir, there was in the *Scientific American* of an earlier date — March 4, 1876 — a publication about the Reis telephone, and a statement of its mode of operation, and an explanation why it would not talk, by Dr. Vanderweyde, — a man of some scientific attainment here in New York, — which was published three days before the Bell telephone was patented. Mr. Shapley, keeping the *Scientific American*, having a file of it, when they came back from his shop, or about that time, handed to Dan Drawbaugh a copy of it containing the account of the Reis machine, and said to him, "*This is something of the nature of the machine (he) was working at then.*"

Those are the words in which Dan himself states it on the stand. He testifies (defts, ii, 1094) that Shapley said that to him when he handed him the *Scientific American* with this Reis description in it. Mr. Shapley having seen, on the 3d of October, the tin can, gave Dan the *Scientific American* containing the account of the Reis publication, and Dan, when he told his story, produced out of his own pocket the very copy which Mr. Shapley had given him. I will read you what Dan says about it. *They* asked him about it (defts, ii, 1094): —

"*Q.* 1603. There was a machine made at Paris, France, as early as 1864, and in Germany before that time, and well known in France and Germany, that is known as the Reis telephone, from the name of its inventor: had you ever known of that machine prior to Mr. Matthews's visit to your shop early in 1878?

"*A.* I think I had. *I got a knowledge of that machine from Mr. Shapley at Mechanicsburg during the time I lived in Mechanicsburg. He gave me a copy of the* Scientific American *that had an illustration and description of it in*, AND TOLD ME THAT WAS SOMETHING OF THE NATURE OF THE MACHINE I WAS WORKING AT THEN. *I think the paper may be in my shop somewheres yet.*"

Dan took that paper, and from it learned about the circuit-breaking method of Reis, and then no doubt he tried that on his tin can which he had got out of the other number of the *Scientific*

American as Bell's invention. Of course this is my inference, — the only proof is in the coincidences.

Your Honor will observe that the publication in the *Scientific American* about Bell does not describe anything accurately. It is a miscellaneous account of Bell's invention written by some ignorant person, and the consequence was that Dan made the thing like the description, without knowing the theory of it; and then he got hold of this lecture of Dr. Vanderweyde on the Reis instrument; and what he did afterwards, *and, as we suppose, in consequence of that publication*, we have proved, as follows: —

Mr. C. A. Landis, another clock maker and jeweller, a brother of the first one, went down to Dan's shop in the spring of 1877. The first visits occurred, as you see, in October, and along there, in 1876; and this other Landis went there in the spring of 1877, and this question was asked him (complts, ii, 1070): —

" *Q.* 7. Did you at any time at Mr. Drawbaugh's shop see any instrument which he referred to as a talking machine, or machine for conveying sounds by electricity; and if so, at which visit was it?

" *A.* I did, at my first visit, which was between March 31 and April 13, 1877.

" *Q.* 8. Before you made that visit, had you heard from any one that Mr. Drawbaugh was engaged on such a machine, or had your attention been called to the fact by any one; if so, by whom?

" *A.* Mr. Shapley called my attention to the fact of Dan's having a talking machine, and said I should see it when I went there.

" *Q.* 9. Will you look at the tray of instruments now shown you — exhibits in this case — and tell me whether you see any instrument among them which resembles the instrument which you saw at Mr. Drawbaugh's shop on your first visit there, about the first of April, 1877?

" *A.* I saw this instrument **B** or one similar to it, at least, *with the exception of the electro-magnets;* this **F** I saw, or something similar to it without the top; they were both lined with plaster of paris inside; I recognize nothing else.

" *Q.* 10. Please describe a little more particularly the tin-can instrument like **B** which you saw there, and state what explanation he gave you of the construction of the parts of which it was composed, and of the way in which it operated.

" *A.* I think it was perfectly similar as this **B**, with the exception of the lining *and the magnets;* at the time I seen it, the *membrane covering the opening of the can had been eaten away by mice*, he said. The string outside and the remains of the membrane were as now.

He said the manner in which it operated was as follows: The membrane had fastened to it a piece of metal; *this strip* which is fastened to the bottom board at the end of the can, — *he said it should be platina*, — it extended upward, the end being directly in front of the metallic piece on the membrane; and, by the action of the waves of sound caused by the voice on the membrane, *the piece of metal and the platina point would come in contact, thereby making and breaking the circuit, which making and breaking would be repeated at the other end of the line.* The other instrument he did not explain.

" *Q.* 11. Of what material is the strip to which you have referred, and how is it lettered in the drawing of the instrument **B**, which the respondents have put in evidence?

" *A.* It is lettered 'H.' This strip is of tin, — the one here on the instrument. I couldn't say positively as to the one I saw.

" *Q.* 12. On the occasion of this visit what led to your seeing the instrument you have testified about? Did you ask for it first, or did he offer to show it to you first?

" *A.* I asked to see it, and he showed it to me.

" *Q.* 13. What part of the shop was it in when you saw it?

" *A.* On entering from the outside stairway, it was in the small room to the left, on the third floor."

That was in the spring of 1877; and Dan had made his tin can in 1876. Having seen the Reis publication, he had tried that experiment undoubtedly; and I am now going to take out this screw which holds down the electro-magnet and show you the Reis circuit breaker in connection with the tin can **B**. Here is this narrow tin strip that leans up against the diaphragm, where there was a patch of metal on it to make the circuit; and your Honor will observe *a little hole at the tail end of this* strip of tin, to which a wire must have been connected; and here is a little screw, which passes through a slot in the tail of this tin circuit-breaker, by which it is adjusted, so that its point will alternately touch and clear the vibrating diaphragm, — just like that little Reis machine exhibited to your Honor in this case. Here is exactly the same thin metal point standing up against the membrane of Dan's tin can, just as in the Reis machine.

The COURT. — There is no spring.

Mr. DICKERSON. — No, there is no spring, of course: it don't need a spring. This point is to be set rigidly, so that the diaphragm, in vibrating to and fro, will alternately touch it and recede from it. There is no spring in a circuit-breaker, unless in one direction, so as to let the point yield after contact; but it must not follow up the contact point on the diaphragm or it would not break the circuit. In the Reis instrument, described in the *Scientific American* article, there is no spring. It reads, "a platinum point attached to the arm, while a set screw brings this point in slight contact with the disk" (defts' exhibits, p. 100). What Dan said was, that this point should be *platinum*. Platinum is the material always used for a circuit-breaker. A spark passes every time the circuit is broken, and platinum is the most refractory metal, and is able to endure the heat of the spark, and is, therefore, used as the point in all circuit-breaking instruments of any consequence. Dan told him it should be of platinum, as it should be for a practical machine; and, in proof of what Landis said, there is the thing that he describes in his testimony. That is a Reis circuit-breaker. (See for this particularly, app. p. 423.)

Now, sir, those witnesses are our witnesses; but they are corroborated by Dan in so far that Dan tells us that Mr. Shapley told him about Reis, and said it was like what he was doing Oct. 3, 1876; *to which Dan made no reply, but by his silence consented.* After Dan got this *Scientific American*, the next man who went down there saw the circuit-breaker. That was more than six months afterwards, and, the witness says, "At the time I seen it the membrane covering the opening of the can had been eaten away by mice." Dan had got through experimenting with the *Scientific American* things in those six months, and was getting ready to follow up Bell closer with his **C** and **I**, etc., for Bell's improved instruments had been described in the papers by that time.

Now, sir, these witnesses have not been contradicted by Dan Drawbaugh. His partners have not called him to contradict them; of course they could not; but, in their place, Dan's partner comes into this Court and exclaims *in this presence*, "WHAT CHEEK, TO ASK US TO CALL DRAWBAUGH!" What an answer! What an answer!

What Shapley and Landis have testified to, stand as *facts proved* in this case. The law of evidence is that that which is in the power of one man to prove, and the other to contradict, is the proper basis of testimony. When they call some idle loafer to say, "I was, on a certain Sunday, ten years ago, in Dan's shop, and I saw a certain thing there," it is not in our power to meet it. We have no witness there, and are powerless. It has only one side to it. But here we have Dan Drawbaugh as a witness; and our witnesses swear, "We said this to him, and he said this to us." It is in Dan's power to meet it and contradict it, if he dare; instead of which, his partner meets us with the logical and elegant remark, "What cheek it is to ask us to put Drawbaugh on the stand!" And this, sir, when we prove that he had those things at that time and in that way,—*which is perfectly fatal to his case unexplained and uncontradicted.*

Now, may it please your Honor, that carries us up to the spring of 1877. Let me compare that picture with what has been sworn to before your Honor. In August, 1876, his partner says Dan had reached high-water mark,—the Blake transmitter **H**, including the microphones which have since been invented by hundreds of men, and beyond which the wit of man has never since gone,—standing in that shop, on that table, by that clock, where Mr. Shapley went to negotiate with him for the use of his money, and where he showed to Mr. Shapley, and to the two brothers Landis successively, the tin can **B**, *first* with the electro-magnet on it, according to the first *Scientific American*, and next with the circuit-breaking point, according to the next publication afterwards shown him.

Well, sir, that old tin can **B** was in the case, and that tin circuit-breaker was on it, and they had to account for that; because that was a circuit-breaker right before your face,—a plain circuit-breaker, with a hole in its tail for the wire to conduct the electricity, and with a point leaning up against the place where the diaphragm would be with its centre of metal; and they had to account for that, and they asked Dan Drawbaugh what that tin strip was for. "Why, sir," said he, "that is a spring I put in there to increase the tension of the membrane." Well, that needs no comment,—that needs no comment; a man, who is a good mechanic, putting a little strip of soft tin on an instrument *to increase the tension of a drumhead.* Of course that is not true; but he had to explain that piece of tin, and it was the only thing to say, unless he gave up his case.

But we have got the witness, may it please your Honor, to whom he *did explain it,*—we have got him; he stands unquestioned and uncontradicted; and he is met by that silly pretence that a piece of soft tin, with a hole in the tail of it to carry off the conducting wire, was meant for a SPRING to increase the tension of the stretched membrane diaphragm on that tin can.

You must decide between those two stories, may it please your Honor; I do not propose to argue it. That is the way it stands, — just so, not otherwise.

While our witness has no interest in the question, Dan's interest is so immense in the golden future that he refuses to disclose it. It is so terrifically great that it runs up among the millions.

Now, may it please your Honor, the next assertion in the testimony before you, — and it is triumphantly claimed by his partner, — is that high-water mark was reached by Dan, August, 1876. Nothing more was done, — I mean *no other invention was made* afterwards, so they say, and Mr. Hill's pride was displayed when he exhibited his partner as having achieved that marvellous work. What was done afterwards? Why, sir, the testimony in the case is, that, from 1876 up to 1879 and 1880, Dan Drawbaugh *was at work night and day* making telephones (see it collected, brief, p. 331 *et seq.*). Dellinger, who did not go there until 1876, is emphatic about it. He was at work night and day making and experimenting on telephones. Dan Drawbaugh's wife, in 1876, complained of his working on telephones, — "*never before*," says Henry Drawbaugh, his brother (defts, i, 419, ans. 46). The newspapers in 1878 said that he then was busy inventing "a telephone *on a different plan from that now occupying the attention of scientists,* which will produce the sounds louder and plainer than the MOTHER INVENTION" (*Mechanicsburg Journal*, April 6, 1878; brief, pp. 210, 218). Chellis could not get Dan to work on the molasses-spigot patterns in 1878, because his whole soul was wrapped up in experimenting and working on telephones (defts, i, 549). *But high-water mark had been reached two years before;* and there stood the Blake transmitter as the monument of that labor in that shop, according to the present testimony. What was he doing afterwards? There is a little piece of evidence here that characterizes both the men. The actors are: Dan, a half-childish sort of creature, as most of these fanatical people are; Chellis, a shrewd speculator of the ninty-nine-cent variety. At that time Chellis was working Dan for all he was worth on the patterns for the new molasses spigot; but Dan was distracted by the telephone work he was doing, and neglecting his partner's work, and Chellis resorted to a little stratagem to control him (defts, i, 549) : —

"I told him," says Chellis, '"Dan, *we will hurry up* and get through with these patterns, and we will look into this telephone, and I will go in with you.' *This seemed to please him, and he talked telephone all the balance of the day, but did not do much, if any, work.*

" *Q*. Did you mean what you said, or was it only a little stratagem to get him to finish the patterns?"

"*A*. I was just using that so as to get him to finish the patterns, *and did not really have much purpose of going on with him.*"

Just as one would manage a peevish child. But what a picture is that! More than two years after "high-water mark," and the Blake transmitter standing on the table before them, and the world full of Bell and his great invention, — *if this story is true!*

All that they offer you as made in these years, however, when all this day-and-night labor are going on, are three fancy machines, having nothing new in them. One of them is the Blake transmitter *duplicated* with two contact points instead of one; and the other is a transmitter and receiver in a fancy box together. This is the machine which Dan made one of his dupes believe would cure deafness, and by which the poor fellow supposed he heard in his deaf ear. In this instrument the vibrating diaphragm, which is to affect the ear, is left in a box, and a tube leads to the ear, instead of placing the diaphragm directly at the ear, as in the Bell instruments in use. That is one of Dan's ideas, — he is the inventor of that.

Mr. HILL. — The diaphragm is in the end of the pipe that he puts to his ear; it also makes an excellent stethoscope, an admirable instrument.

Mr. DICKERSON. — The sounding diaphragm is in the box, the pipe coming to the ear; but nobody uses it or wants to use it. That is all the result they offer for those three years' day-and-night work. What was he doing in those years, may it please your Honor? Was he not hanging on to the Bell wagon, and copying the developments as they came out in the world? One of these newspaper articles says about him, "There is nothing engages the attention of the scientific world that does not also interest Drawbaugh"; and so it was here. He was chasing up Bell, going up to the Western Union office in the city of Harrisburg, examining and borrowing telephones, and tak ing one instrument home with him and keeping it two weeks; and having the instruments he did not borrow opened to see how they were made, and then going down home and making them.

The COURT. — When was that?

Mr. DICKERSON. — *That was in the spring of 1878.* He went up to our place in Harrisburg, — when I say "our place," I mean the Western Union place, — he went up there and borrowed — actually borrowed — a Bell telephone. It was in the spring of 1878, sir, when he went up there to see what is called the "snuff box."

Here, sir, is the telephone called the "snuff box," made by the Western Union Company at that time, infringing the Bell patent, and here is Dan's A.

Now the difference is, that A is round, and is turned on a lathe, while the snuff box is made in the shape of an ellipse; but they are both magneto receivers.

Dan went up to Harrisburg and asked to see the inside of this "snuff-box" instrument. Zeigler, the witness, opened it for him, who thus testifies (defts, ii, 1028): —

> "He looked at it a moment or so, and with a significant shake of his head said, as near as I can recollect, 'Mine will not do: it is too much like that.'"

I should say so; I should say it was slightly. Then he borrowed the Crown instrument, which is a magneto instrument made by Phelps, owned by the Western Union It has the permanent magnets curled around behind the electro-magnet, instead of extending out behind it in a straight line, as Bell makes them, but they are the same in effect. It is a fanciful way of making the instrument. Did Dan get his idea of the curled and bent magnets then? DAN NEVER THEN SAID THAT HE HAD INVENTED THE TELEPHONE!*

This all happened when Dan was working day and night on telephones, and when his wife at home was naturally complaining that in place of attending to his business, — the business at the faucet place, or the clock place, or wherever he had anything else to do, — he was bothering himself with these things, and not doing any work; and she said to Chellis: —

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* See Zeigler, abstract, 412; Wert, p. 415. Also, brief, 221, 279.

"Mr. Chellis, Dan works at the telephone as soon as you go away, and most every night does not get home until twelve or one o'clock . . . and he said he would go to the poorhouse before he would give up working on it" (defts, i, 549).

How much we are indebted to Chellis for valuable information! That was in 1878–9. Where is the product of that work? It does not exist, *unless it is to be found in the instruments which are said to have culminated in August*, 1876.

Now, sir, that is the story told by both sides. It is our story uncontradicted; but all this, your Honor, is in our brief and our abstract, and I will not now read the testimony relating to it. I am trying to bring your Honor up to our points by making a rapid statement of the testimony in its logical order.

The COURT. — Have you anything in your brief bearing upon that point?

Mr. STORROW. — It will befound pp. 189, 190, 203, 204, of the brief.

Mr. DICKERSON. — We now come, may it please your Honor, to *the record evidence;* and here we have got Dan Drawbaugh on record.

Mr. Matthews from Baltimore, the editor of the *Baltimore American*, attracted by the publication in his own paper of an article in which Dan Drawbaugh was described as the wonderful inventor of this wonderful clock, travelled two hundred miles to see the wonderful clock, when every newspaper was full of telephones. That was in the spring of 1878. Drawbaugh, at that time, your Honor, had in that room where he and Mr. Matthews stood, *if this testimony be true*, this collection of the most marvellous creations that ever came out of the brain of man, as their expert tells your Honor; and *Drawbaugh did not show them, or say a word about them.* Think of it! it is a miracle. Not the kind of miracle by which Dan made the deaf man hear; here was a man too intelligent to be humbugged. Mr. Matthews and Dan stood together in that room, April, 1878, with all these marvellous things, when every newspaper was full of the telephone, and the improvements on it which were being made by hundreds of experimenters, and what did he say? Mr. Matthews wrote an account of what he said and published it. Here it is; it is a mere incident to his elaborate account of Dan's wonderful clock: —

"It may be *mentioned* that Mr. Drawbaugh constructed a rude telephone long before Edison loomed up as the boss inventor. HE NEVER EXPECTED TO SEND ARTICULATE SPEECH OVER A MAGNETIZED WIRE; but he believed that the ALPHABET could be arranged after the manner of the musical scale, and that messages could be transmitted by the variations of tone and pitch."

Your Honor remembers Dan's ALPHABET instrument, which so many have described.

Matthews *took notes of Dan's statements*, and went home, and wrote his account to the best of his recollection; and he sent that paper back to Dan, who acknowledges its receipt. Dan then stood in the presence of a man who could have given to the world on the wings of the wind the claim that he was the first inventor, or could have given vent to his moans, if he had any. Bell stood before the world crowned with glory. But here with this ready vehicle for appearing before the ungrateful world, and telling his wrongs or his rights, what did he say? Why, that he experimented on this thing before Bell or Edison, but DID NOT EXPECT TO GET ARTICULATE SPEECH. Mr. Matthews, who was not a scientific man, drew a conclusion from what he said that he had intended to use musical tones. He says in his testimony that Dan did not *speak* of musical tones, but he inferred from his talk that he meant to use them.

Imagine, sir, Dan stating to a newspaper editor in 1878 that he had "NEVER EXPECTED TO SEND ARTICULATE SPEECH," if he had in that room, and had had for ten years, instruments that would talk so that a countryman, or a child, or a woman, could come in there and read newspapers through them, well known to everybody in the neighborhood; and when there they were, monuments of his work, standing all around him, about which he never opened his lips, except to say he never expected articulate speech.

It is not in human nature! God does not make the human animal that way. None was ever made so. He makes them so that they will lie, and will steal, and will do all manner of evil things; but he does not make any that will act like that. He never has; and the Court takes judicial notice that he never has. (For Matthews, see brief, p. 210.)

Mr. HILL. — Just a moment. I will state that the letter of

Matthews has not been filed; I am so informed by the clerk, who tells me that it has not been filed.

Mr. STORROW. — It is to be filed, and it has been in the clerk's hands this forenoon.

Mr. DICKERSON. — That is to be the part of the proof. Now, may it please your Honor, *this was a mighty piece of evidence.* It needed very much that it should be attacked; and it *was* attacked in the most delicate and insidious manner that I have ever seen in a court of justice. My friend, Senator Edmunds, with the tact which characterizes him in all his efforts in the world, either as an orator, a logician, or a gentleman, being entitled to take every *fair* advantage in the case, thought that he would give Mr. Matthews's deposition and Mr. Bell's counsel a stab in the back. In the most delicate manner he turned to my Brother Storrow, right here, and said, "I think it my duty to ask my friend, Mr. Storrow, if he has not a letter from this witness contradicting or impairing his testimony." That was a delicious moment for us. We saw Mr. Edmunds looking into the muzzle of that gun to see whether it was loaded — and it was. He was not here this morning at the funeral. He shot a Parthian arrow and fled. Here is the letter which was to demolish Mr. Matthews and us at once, and it only reaffirms Mr. Matthews's deposition. If Brother Edmunds had known us as well as we know him, he would not have suspected us of suppressing any testimony.

But, sir, another *record* came up just then, — DAN DRAWBAUGH'S AUTOBIOGRAPHY, written by his own procurement, and published in the place of his nativity, in which he says of himself — what? That he is the "*inventor of the* JUSTLY CELEBRATED ELECTRIC CLOCK, *and of several kinds of telephones.*" Well, there was one thing at that time in the world JUSTLY CELEBRATED, and that was the telephone; and there was the electrical clock, which Dan had got celebrated, but not "*justly.*" There is where he put in a falsehood that he invented the clock; but it was *celebrated.* But, being the *true inventor of the telephone, as he now says*, and having copied Bain's clock out of the encyclopædia, he stood there and gave to the world an account of himself in the spring of 1878, and he told the world, "I am the inventor of the *justly celebrated electric clock*, and of *several kinds* of telephones."

And your Honor now knows, because you have been told so by Dan's partner, that *we* were trying to hunt up Dan's manuscript of that published autobiography TO DESTROY IT, FOR *fear your Honor should get at it*, in which we failed ignominiously, because Dan's partner produced it *out of Dan's possession*, to make sure he wrote it. The opening sentence of that autobiography is,

> "DANIEL DRAWBAUGH.
>
> "*One of the greatest inventive geniuses of this age* (SO PROLIFIC OF GREAT MEN) *is the subject of this sketch, Dan'l Drawbaugh*, who was born in year ——, in the quiet, secluded village of Milltown, three miles S. W. of Harrisburg, where he has spent the greater portion of an active life conceiving and producing, as a result of an unusually fertile brain, a score of useful, ingenious machines and devices."

We *know* that Dan is a very "modest and diffident" man, because an unimpeached witness has so sworn. How it must have tried him to write this!

At Mechanicsburg, at this time, his friends were publishers of two newspapers, called the *Saturday Evening Journal* and the *Independent Journal;* and in April, 1878, they were puffing Dan and reporting what he said to them of himself. These papers had, in * October, 1877, spoken of "Bell's telephones" going into use in England; and April 6, 1878, the *Journal* states, "we have been informed that Dan Drawbaugh, the celebrated mechanic of Eberly's Mills, is inventing a *telephone on a different plan from that now occupying the attention of scientists, which will produce sounds louder and plainer* THAN THE MOTHER INVENTION."

The COURT.—Where is that reference?

Mr. DICKERSON.—I will give it to you, sir: p. 398, complts, iv, exhibits; brief, pp. 209–218. On the next page the *Journal* describes Drawbaugh as a magnificent genius,—how he talks like a buzz saw. They say, "He labors like he talks, with a *rush and a gush, that nearly bewilders his auditors.*" You could no more understand him than you could understand a buzz saw. They then say, "*We are under obligations to him for much information in general and* TELEPHONES IN PARTICULAR, and the *Independent Journal* will be glad to announce the completion of the NEW TELEPHONE *he is constructing*, and hopes the speaking machine will bring many dollars into the pockets of its ingenious inventor."

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* Complts, iv, exhibits, 407.

The editor also says: "Mr. Drawbaugh is an indefatigable worker in his *special* line, and he never gets discouraged." We have found *that* out to our cost, sir.

The COURT. — Will you give me a memorandum of that?

Mr. DICKERSON. — Yes, sir; that is p. 398 of Vol. IV. of complainants' exhibits, brief, pp. 209, 218. There is Dan Drawbaugh on record on his own information.

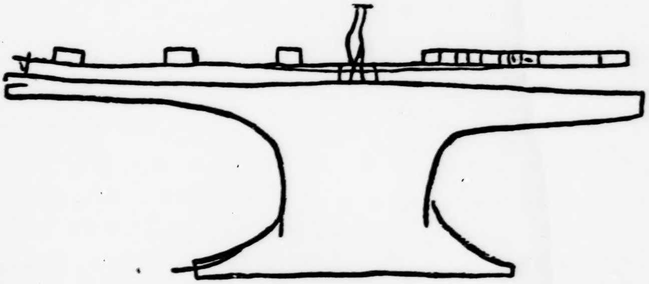
The COURT. — Who was the correspondent who contributed this article to the *Saturday Evening Journal* of Mechanicsburg?

Mr. DICKERSON.—It was done by the editor.

Mr. HILL. — A man by the name of Rockafellow, whose affidavit they took in their moving papers, but did not examine as a witness, because he had been convicted and sent to the penitentiary.

Mr. DICKERSON. — It is true, I believe, that the man has since been in the penitentiary; but the articles were published in a newspaper, and the newspaper has not been in the penitentiary, that ever we heard of. They were published at the time in his own village where he lived, and by his friends: and Dan Drawbaugh has not attempted to explain or contradict them. We could not call this convict, of course, so we tracked Dan right to his office, with his telephones in his hands, and we cross-examined Dan about these articles, who admitted that Rockafellow came to see him and was shown the telephones Dan was then working on (brief, p. 209).

I now proceed a little further. About that time, sir, his Clock Company was at work, and he was going through the farce of applying for some sort of a patent about that clock, and the company employed Mr. Theophilus Weaver as their patent agent, and Drawbaugh went to Mr. Weaver to give him instructions how to draw the patent for his "*justly celebrated electric clock*"; and then he said to Mr. Weaver, "I experimented on the telephone, though I never made anything out of it." Mr. Weaver was a patent agent, and naturally anxious to follow up a suggestion like that, and in reply to a question, Dan said to him that he had been experimenting on telephones; and Drawbaugh drew a sketch of the telephone he had been experimenting with on the back of the specification which Mr. Weaver was preparing for this "justly celebrated electric clock." And that is how it came to be preserved. Theophilus Weaver produced it; and here is a photo-lithographic copy of it (complts, i, 399; iv, 363.)



This was in the spring of 1878. Just look at that sketch, your Honor. You see that there is evidently a lever running from left to right over a telephone diaphragm, with its point resting on the centre of the diaphragm, and with a wing or flat piece out at the extreme right-hand end. You see that the motion of the telephone diaphragm communicated at its centre to the lever by the pin will be increased at the end of the lever; and the amplitude of vibration will be increased. If the centre pin moves the one eighth of an inch, for illustration, the end with the plate on it will move two eighths, and more sound will be made. This is an idea that has been hit upon by many mechanics, — that possibly they can make the telephone talk louder by putting on a lever and increasing the amplitude of the air vibrations which strike the ear. It is an obvious idea to a mere mechanic, but it is not a practical thing to the electrician.

Well, he made this drawing on the back of the specification that Weaver was then writing for his clock. That is the way, in the providence of God, that it comes to be preserved; and we have it here, and it shows how Dan was going to make the telephone "talk louder." Mr. Weaver was an old friend of Dan's; he had been his friend for years and years; he had been the man to whom Dan had been applying from time to time for patent information; and Dan had been reading patent books in his library. More than that: in 1876, when the Axle Company was about winding up, Mr. Weaver had a mind to buy it out, and he went down there and spent two days with Dan, in that very room where **D** and **E** and **L** and **M** and **G** and O, and all these things were, in taking an inventory of the Axle Company's property, for the purpose of determining whether or not he would buy it. During all that time Dan never said "telephone" to him. Weaver was *his friend and a patent agent*. As they now swear, Dan was all the while bursting with grief, and bemoaning his hard fate, because he could not get anybody to apply for a patent for him for these great inventions, which, at that time, he had brought to their ultimate perfection. Does anybody believe that? The intellectual stomach can hold that stuff about as easily as the physical stomach can hold two ounces of ipecac. The defendants made an insulting cross-examination of Weaver by putting into their questions insinuations, every one of which was false; but they never attempt to contradict him by *Dan, who knows* that it is all true. (See abstract, p. 398.)

But we will go a little further. There are two gentlemen in Harrisburg, by the names of Kiefer and Wilson. At that time, Mr. Kiefer was the superintendent of the telegraphs of the Pennsylvania Railroad, and also had a telegraph-supply store in the city of Harrisburg, where he sold electrical supplies. His firm manufactures for the United States government their electrical apparatus. The other gentleman is Mr. Wilson, the telegraph superintendent of the Northern Pennsylvania Railroad, which runs up through Harrisburg, and diverges through different parts of the State. Now, if there is any human being on the face of the earth who is and must be accurate and reliable, it is the superintendent of the telegraph system of a great railroad. Thousands of lives depend upon the accuracy with which he administers his responsible trust. A single message falsely sent or falsely omitted, and a train rushes to destruction, and hundreds of lives may be lost. Plunging, as trains do in the dark night, through fog, and sleet, and snow, they must rely with the most perfect confidence upon the fact that that little wire has carried before them the information that they are coming, that the line may be clear. If the operator neglects his duty, then a terrible crash may occur. And here is almost the only danger of railroad travelling to-day. Since I have been arguing this case, we have read in the papers an account of a terrible calamity which has occurred upon the Baltimore and Ohio road because one of the telegraph men failed to do his duty, and thereby sent to sudden death innocent men who had relied upon and trusted the ability and fidelity of that man. Their fate had depended upon his integrity. These two gentlemen, Kiefer and Wilson, were the superintendents of the telegraph lines of those two great systems. One of them is now, or was when this testimony was taken, the mayor of the city of Harrisburg, although I do not know that that of itself is any great recommendation; but to be the superintendent of one of these great systems for years *is a very high recommendation.* These men were friends of Dan Drawbaugh. He went to them for information, and for supplies, and he took to them his magneto key, and wanted them to use it. Yet, during all those days he never said "telephone" to either of them. If he had, *and if he had had those things*, Alexander Graham Bell might as well have not been born. His name would never have gone beyond the town of Cambridge, or wherever it was that he then lived, if this testimony be true.

In their argument my adversaries have never attempted to explain to your Honor why he did not speak to Kiefer or to Wilson (for they were both helping him with his electrical work), — why he never said to either of them anything about his telephone. They do not attempt to explain this fact. They are as dumb as an oyster; but they turn to your Honor and say that they have a cartload of Ditlows and Kahneys, and cattle like that, and that you must believe their story, because they have sworn to it. For Messrs. Kiefer and Wilson see brief, pp. 273–8.

The Court. Have you any evidence as to what instruments were in his shop — either these, or resembling these — prior to the time when he was at work on the magneto-electrical machine?

Mr. Dickerson. Yes; we have some evidence on that subject. Undoubtedly the string telephone was there. Two or three of their witnesses described *the tin can with a string*. In John Drawbaugh's shop, across the road, there was a string telephone; and about that there was a piece of work done that I will occupy a minute or two in speaking of, for it will illustrate the whole case. It and other evidence on the subject are in our brief (pp. 311–313).

John Drawbaugh, Dan's brother and next-door neighbor, had a string telephone in his place, and the partners knew about it. A witness named Eppler speaks of it. He told the partners about it. He told them that he had seen in *John* Drawbaugh's place a talking machine, which was a *string telephone*, and that he had gone home and made one. Thereupon they called him, — or rather we had called him as our witness about a date, and they made him their witness on that subject, — and proved by him, by careful and adroitly limited questions, that he had been at Eberly's Mills in a shop owned by a *man named Drawbaugh*, and had seen a talking machine there in the year 1872, 1873 or 1874, — somewhere along there; and that he had told Mr. Storrow that he had seen a *talking machine* in Drawbaugh's shop at that early day. That looked very serious. If they could have proved that Mr. Storrow had information of such a thing as an electric telephone at that time and place, and had suppressed it when he put the witness on the stand about something else, they would have damaged us and our case immensely. They took the chances of trying to do that very thing by that particular witness. When the direct examination closed it left us in the position of having been told that *Drawbaugh, impliedly Dan, of course*, had a telephone, a talking machine, in 1872, 1873 or 1874, and of never having mentioned it. If that fraud won, it was all right; if it failed, they thought they were no worse off than they were before. Fortunately for us, Mr. Storrow knew all about it; and on cross-examination it turned out that this witness had told him that it was a *string telephone* in John Drawbaugh's shop there in the village, and that he had gone home and made one himself just like it; and, more than all, that he *had told the true story to Mr. Hill before he was examined.*

The COURT. — Did he say it was in Drawbaugh's shop?

Mr. DICKERSON. -- Yes; in "*Drawbaugh's*" shop.

Mr. HILL. — But not in Daniel Drawbaugh's shop. Daniel never had anything to do with it.

Mr. DICKERSON. — The witness was so examined as to say it was in "Drawbaugh's" shop, which your Honor, or any one under the circumstances, would have understood to mean Dan Drawbaugh's. *We* got it out of him that it was in *John* Drawbaugh's shop, and a string telephone; but he said "Drawbaugh," and left the inference that it was Daniel Drawbaugh's shop, and that it was the *electric telephone*. That was a stab in the back that might have made a wound that could not have been cured; but fortunately for us, Mr. Storrow knew the facts, and proved by him that he had told them all to Drawbaugh's partner before he was examined. It left a string telephone right there in the village in the hands of Drawbaugh's brother on that day, and neither Daniel nor John Drawbaugh have been called since.

Mr. Storrow walked among pitfalls and was not entrapped; he handled pitch and was not defiled.

We do not attempt to reconcile the defendants' contradictions, or to explain their story. Many witnesses have sworn to things who are not specifically attacked. A laborer swears that ten years ago he saw a telephone, and tells nothing else important. How can he be assailed? He does not describe anything, and is incapable of doing so; but they hold up to him the tin can and he says he saw it and heard it talk. Maybe he did in 1877. Maybe it was a string telephone he saw in 1870. We don't know. But there are a great number of cases where these witnesses have been carried over from the date before our patent as sworn to by them to the true dates when they saw Dan working these things, and so have proved our case for us. As your Honor knows, these witnesses were examined *years after the event*. Whatever Dan did, no doubt happened between 1876 and 1880. *Our* witnesses saw it then from its beginning. Their witnesses saw it too, and then shoved it back years, either wilfully or ignorantly. I will give you one illustration on this point, and will then have done with it.

The COURT. — I did not know, when you spoke of the existence of a string telephone, but there were some intelligent witnesses who had testified expressly to having seen it.

Mr. DICKERSON. — There are specifically Eppler and Eicholtz (brief, pp. 311–313). Generally they simply state the facts that can be accounted for only by the existence of the string telephone. One witness says that the instrument was composed *of two tin cans with a wire betweem them* (brief, p. 310). That was a string telephone. He does not call it a string telephone, but he describes it.

The COURT. — When did these string telephones first come into use?

Mr. DICKERSON. — They are [illegible] record prior to 1869 (complts, ii, 1175).

Mr. HILL. — They have been known since 1680, in some form or other. They are very old. They are sold on the street, and then disappear for a while. Now they have got them improved so as to be very useful. A number of ingenious appliances have been made, and they are capable of being used to some advantage.

to prove by a hundred laborers that they saw some incredible thing ten years ago, and they should swear to it, and it is perfectly absurd in its face, what then? The other side would say, "Well, that is proof; why don't you impeach their character for truth and veracity in the community in which they live?" We say that they have no character for truth and veracity, or anything else. They are mere ciphers in the body politic. Their story must be judged by other standards.

I now come to a few remarks about the Bell patent. It has been criticised at length. I do not think I need to spend any time about it. Whatever is to be said about it is in our brief, and, I take it, the questions are concluded by the decisions of the courts, who have heard this kind of talk before, and have passed upon it; but it is just to Mr. Bell that I should make one or two statements with regard to his patent. In that patent you will find two things. One of them is a general description of a liquid transmitter, — one mode of producing the undulating current, which is the basis of his invention, by varying the resistance through a liquid transmitter: that is in the patent, I read from page 5 of the Book of Patents: —

> "Undulations are caused in a continuous voltaic current by the vibration or motion of bodies capable of inductive action; or by the vibration of the conducting wire itself in the neighborhood of such bodies. Electrical undulations may also be caused by alternately increasing and diminishing the resistance of the circuit, or by alternately increasing and diminishing the power of the battery. The internal resistance of a battery is diminished by bringing the voltaic elements nearer together, and increased by placing them farther apart. The reciprocal vibration of the elements of a battery, therefore, occasions an undulatory action in the voltaic current. The external resistance may also be varied. For instance, let mercury or some other liquid form part of a voltaic circuit; then the more deeply the conducting wire is immersed in the mercury or other liquid, the less resistance does the liquid offer to the passage of the current."

There is the variable-resistance method, done through a liquid.

> "Hence the vibration of the conducting wire in mercury or other liquid included in the circuit occasions undulations in the current."

Then he goes on and mentions other things; and then he describes the *generation* of a variable current, made variable in the act of its creation. That is the magneto method, with which your Honor is familiar; and he then describes Fig. 7, *the speaking telephone.* The fourth claim of his patent is: —

> "4. The method of producing undulations in a continuous voltaic circuit by gradually increasing and diminishing the resistance of the circuit, or by gradually increasing and diminishing the power of the battery as set forth."

The fifth covers the whole field: —

> "5. The METHOD OF and apparatus for transmitting *vocal* or other sounds telegraphically, as herein described, by causing electrical undulations, *similar in form to the vibrations of the air accompanying the said vocal or other sounds*, substantially as set forth."

That was the great discovery — to bring that current of electricity under the *control of the voice*, so that its "form" (to use a scientific term) should vary exactly as the "form" of the air waves generated by the *voice* of the speaker varies. That was the magnificent conception which has filled the world with speaking telephones, and made this dull earth as if it were a living body, alive with nerves from one extremity to the other. That, sir, was the grand conception; and *that was patented as a speaking telephone* (brief, p. 68).

When it came before the men of science in the world — before those chosen judges who assembled to Philadelphia, the chief of whom was Prof. Joseph Henry, tutor of my boyhood, guide of my youth, friend and companion of my manhood! and along with him Sir Joseph Thomson, the greatest living electrician — they bowed their heads in veneration; they expressed their astonishment in words beyond which the English language cannot go. Sir William Thomson said: —

> "Who can but admire the *hardihood of invention* which devised such very slight means to *realize the mathematical conception*, that if electricity is to convey all the delicacies of quality WHICH DISTINGUISH ARTICULATE SPEECH, the strength of its current must vary continuously, and as nearly as may be, in simple proportion to the velocity of a particle of air engaged in constituting the sound." (Brief, p. 66.)

Before that great tribunal Alexander Graham Bell appeared, unheralded and unknown; and, as if illumed by a flash of lightning, he emerged from that great exhibition with *a name*, — the only name which was there made immortal.

But who else was there?

Groping around in that crowd was Daniel Drawbaugh. He spent five days there. When Mr. Bell stood upon that pedestal of fame, honored by the assembled wisdom of the world, Drawbaugh had at home, as they now swear, and **E** and **H**, the Blake transmitter, and he opened not his mouth. He went there with the richest man of his village, — George Leonard, — who was his next-door neighbor for years, and who had never heard at home of Dan's invention. But Dan was so modest that he could not even lean over and whisper in Leonard's ear, "My dear sir, this is very remarkable; I have had those things at home for ten years, but never told you before. Don't mention it to anybody now, for fear that my modesty may be shocked; but I have got them *much better* at home." He did not even have the courage to do that. He stood there in blank silence while the pæans were sung in praise of Bell's wonderful invention. Then what did he do? He went right home from that place, and never opened his mouth to anybody to complain, but sat down to work out a deliberate little scheme to cheat Shapley out of some of his $2,000, by selling him the *right to patent the electric clock;* and he made the contract to do it on the 6th of November. That is what happened. And from that time he plotted on with his little games, beholding this magnificent invention extending all over the world, yet never opened his mouth. When his partners, the ninety-nine-cent man and Dr. Moffitt, made their contract with him in 1878, two years afterwards, to go into the molasses-spigot business, he asked them to help him in his telephone experiments, but they objected that Bell was the *inventor* and he couldn't anticipate Bell; to which he said, "I don't know about that; I have been working at it a good while," — when, right there in that room, where they all then were, were all these great inventions, perfected, then two years old, and the telephone itself more than eleven years old. I cannot talk about such stuff with patience. As the Supreme Court said in the Atlantic Works case, it may be all true, but it would not be safe for courts to assume it to be true; it is so contrary to all the rules that govern human conduct.

Now let me show you, if I need to do it, Dan's "Blake transmitter," and with it the *real one*. It has been pointed out to you earlier in the argument, when you were not so familiar with the physics of the case as now. They are the same thing. There is not the least difference. When Macaulay was reviewing the Life of Madame D'Arblay, — born Frances Burney, — and came across some passages in Evelina in the magnificent diction of Dr. Johnson, who was the intimate friend of the author when she wrote the book, he pointed them out in his review, and exclaimed, — "Sam Johnson, or — the devil." That is all I need to say here: "Blake, or the devil."

Here is the Blake transmitter. It has a cast-iron ring just like Dan's. Here is our cast-iron ring. Our bridge is across here just the same; then the delicate adjustment; and then comes the carbon holder. The joke of it is that in the real thing that little brass cup which holds the hard carbon is filled with lead *in order to give it inertia*, which is essential; but one cannot *see the lead* without first taking out the carbon. When Dan copied it he made the brass cup just as in the original, but he *did not put in the lead*, which he couldn't see. That was his *modesty* again. But another thing. There is a spring finger which holds our diaphragm in place. It is very desirable to have the diaphragm untrammelled at its edges; and this finger holds the diaphragm in its place in such a way that it does not need any other fastening and can be left untrammelled. But, as you look into it, you do not see that the diaphragm is untrammelled at the edge, and Dan did n't know that device. He hadn't borrowed a "Blake transmitter," and taken it home to dissect, as he did the magneto instruments. Well, sir, Dan has put the finger there to hold the diaphragm in place; *but he has also screwed the diaphragm fast*, whereby the capacity for free vibration is impaired. He fell into that trap as he did into the brass cup, because he could not see on inspection these two things.

When he was working days and nights, and running up to Harrisburg to see those instruments, he did not know all about them; and so, when he copied them, he did not copy those concealed devices.

And there, sir, is that electrical lever — the Ruhmkorff coil — right in Dan's box, as it is in the Blake transmitter. What did he know about an electrical lever, and the Ruhmkorff coil? How should he even know that it was needed? He did not have any light on the question. The *necessity* for that thing was ascertained only by trying the telephone *over long lines*, where the current was affected by the induction which comes with long lines, and where this device was needed to increase the intensity, which it does. But until a man had tried the experiment on a long line —until he has made that thing and found it to be deficient — he would not think of applying a Ruhmkorff coil there.

And so in regard to this wonderful microphone. Let us see how that was discovered. The moment Bell's patent came into existence, in which he pointed out to the world the variable-resistance method, — he had two telephones in Philadelphia in June, 1876; one with a battery and variable resistance, and one the magneto instrument, — the moment they came out hundreds of men immediately began investigating to find out some better material for the variable resistance than water or mercury as pointed out in Bell's patent. Edison, with that kaleidoscopic brain of his, that keeps turning out infinite permutations, set his whole shop to experiment on that problem, — picking up a lump of coal, or a piece of pine wood, or anything on the earth, and trying it in order to see what was the most sensitive. There was only one way by which they could find that out; and that was by the use of the telephone itself. There is no other instrument known to man which can detect these delicate variations. Nothing can do it but the thing itself. *It* had to feel for and find out carbon. That is how the *scientific men* found it out, — by months of experiment. There is nothing else will do it. But Dan had only to walk up to Harrisburg and pick up a piece of hard carbon in the yard of the gas company and put it in. That is how he found it, he tells us. Talk about hundreds of men being engaged in making that discovery; he could beat them to death on that. He simply walked into a gas house and picked it up, and it was all right. Nothing easier in the world. But his partner asked him how he came by it. It was of course to be supposed that the man must have had some road to it, and so he was asked that question (defts, ii, 805): —

"*Q*. 150. Do you remember *how* you first obtained knowledge of that fact that low conductors, when under pressure, would conduct the current more freely than when not under pressure; that is to say, did you learn it by reasoning it out and then testing it, or by accidental discovery, or by reading it somewhere, or by hearing it from some one, or how?"

That is the question. How did you get at it? Why on earth should a man think of doing such a thing? What led him to it?

"*A.* I don't remember how I came to it; I had been experimenting in that direction; I DON'T REMEMBER OF GETTING AT IT BY ACCIDENT EITHER; DON'T REMEMBER OF READING IT; I DON'T REMEMBER OF ANY ONE TELLING ME OF IT; I DON'T SUPPOSE ANY ONE TOLD ME."

There is the discovery of a fact that has given fame and fortune to a number of people in the world; yet when Dan was asked, "How did you find it out?" he says, "I don't remember; I don't know; I don't know whether I read of it; I don't remember of any one telling me of it; I cannot tell how I got it." (See brief, p. 286.)

Mr. HILL. — The Blake transmitter came out about the beginning of 1879.

Mr. DICKERSON. — No, sir; it came out before the beginning of 1879; it came out in the fall of 1878. Now, don't make any statements, because you are wrong, every time.

Mr. HILL. — The first came out in November, 1878, but it did not begin to be introduced generally until the beginning of 1879.

Mr. DICKERSON. — All these things are in the papers. I am stating my recollection on the subject, without turning to the papers. The invention that led up to it began away back in 1877. Carbon for telephones was in the newspapers in 1877. It is all in the record. (Complts, iv, exhibits, p. 433.) Edison was the leader. His experiments were in the newspapers. Dan was following him with that devotion to science which induced him to do everything that other scientific men did, *just after they did it.*

We have had an argument on these questions. We presented these points in our general presentation of the case by my learned brother Storrow, whose knowledge of this record, as compared with mine, is as the knowledge of Henry, compared to a schoolboy's. He made that record. He stood by it during all these years. It has grown into his intellectual fibre so that he can put his finger upon the very place of the page where anything is. He has given this argument a perfect explanation before your Honor; and the other side was here to answer it. They brought one of the ablest lawyers of the United States, — a man whom we all honor and admire, — and whose eloquence always commands the attention either of senates or of courts. He made an argument. He told your Honor that he had gone over this record page by page and paragraph by paragraph, and knew it by heart. He began his argument by telling us about Columbus. He said: "Behold Columbus. He offered a new world to the kings of Europe, but no man would listen to him"; and he then compared Dan Drawbaugh to Columbus, — as the man who had offered this new world to the country folks around Eberly's Mills, and nobody would listen to him. There was one little defect in the comparison, which lies in the fact that when Columbus offered the new world, *he did not have it;* but when Dan Drawbaugh offered his world, he had it (if their testimony is true) and could show it. That was a slight difference between the two cases.

But I will just reverse the order of that comparison. Suppose Columbus to have discovered America, and for four years afterwards to have enjoyed the fame and fortune which it conferred upon him; and that then some fellow who had been paddling about in the harbor of Cadiz in a dug-out for some years should have come ashore some day and said, "I discovered America years and years before Columbus." That would be a startling proposition. They would naturally ask him, "Why didn't you mention it before?" "Well, I don't know." "But you stood right here in the crowd and saw the grand procession pass by with the great admiral at its head?" "Yes; I was there; but my modesty overcame me so that I could not speak." "But what means had you for going there? That dug-out of yours is not a ship, and you had no compass; how did you get there?" "Oh, well, I don't intend to explain that. I don't know whether I read of that, or heard of it; but I got there. I know I did, or I would not say so." "But you have got upon your chart not only Cat Island, which Columbus discovered, but you have the continent, and all the other islands that were discovered by a hundred other navigators afterwards. How do you account for that?" "Oh, well, I went there frequently." "But when did you discover these other islands? In what year?" "Gentlemen, I cannot really tell; I would tell if I could, but I was discovering so many continents just then that I have really forgotten."* "But," says the interlocutor, "look here, my friend, I see on your chart, which you have got, not only all those things, but you claim to have discovered Rome, and Egypt, and Athens, and Jerusalem;† and you have got people around you who you say came from Jerusalem to prove you have been there. How does that happen?" "Well, gentlemen, I cannot tell; but here are the charts." "But Rome and Jerusalem, Egypt and Athens, were discovered before America, and yet you say that you discovered all those places; how did you happen to get them on your chart?" "I did not know they were discovered by other people. I am not a scholar. I do not read very well. But if you have any doubt about it, I can show you the people that I brought with me."

Now, that is the story that Mr. Edmunds's venerable friend Dan tells, applied to his Columbus illustration. You are asked to believe that the man in the dug-out, who had stood by for four years and seen the fleet sailing, and the Great Admiral lifted above all other men in the world, and yet opened not his mouth, had actually done all these things, simply because he tells you he can go to the dock and get two hundred and fifty fellows who will swear that he told them *he* did it, and showed them the *outside* of his map.

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* Drawbaugh's deposition (defts, ii, 827): —

"*Q.* 268. Do you recollect when this instrument **H**" [the Blake transmitter] "was made, so as to fix the time?

"*A.* Not positively; I don't know any date particularly.

"*Q.* 269. Several witnesses have testified to seeing this machine, either completed or in process of completion, in the fall of 1876. What is your recollection as to that fact?

"*A.* The time elapsed — just judging by the time — it may be at that time or before; *I had been making a good many of them; I paid no attention to the time; it has slipped my memory.*"

As to making D and E, defts, ii, 827: —

"*A.* 265. *I have no recollection of the time. . . . I can't remember the year or date of it.*"

See brief, pp. 362-365.

† Dan claims to be the inventor in 1867 of Bain's electric clock, first shown in 1840, and published in the encyclopædias generally; Henley's alphabet telegraph, patented in 1861; the magneto key, patented by Henley and Foster, in 1848. for operating the needle telegraph, published in the ordinary telegraph manuals, which Siemens in 1859 improved by adding his new armature and applied to the Morse system; the *automatic* fire alarm, by means of an expanding rod which will close an electric circuit and ring a bell when slightly overheated, patented by Wheatstone in 1860, and with some modifications advertised and put into general use in the country for years by Watkins and others; Bakewell's and Caselli's copying telegraph, well known long prior to 1867, and in electrical books generally (for all of which see Pope, complts, ii, 1381 *et seq.*); Horton's patent pendulum, shown him by Shapley, and this applied by him to the "*justly celebrated electric clock,*" and claimed as his invention (complts, iv, 358-9); the phonograph, the Giffard injector, the rotophone, every variety of telephones and eveay improvement of detail in them, besides winding engines, and a host of other traps. For these see brief, pp. 340, 341.

The argument of Mr. Edmunds consisted of three points, and they were very good points, if his premises were true. *First*, he said that Drawbaugh did not make this invention known, because his neighbors scoffed at him, and scouted him, and nobody would believe it, therefore, he kept it to himself. That was a very good argument. There have been inventions made by men who were scoffed at by the world, and they kept quiet. It is not an unexampled fact. But such is not *this* case. Pages of witnesses (I will not stop to read them now; they are on the record and in the brief, pp. 79–84) tell you that they all said he would be the richest man in the valley if he could only do it; that they all recognized its great value. His brother Henry told the fellows up in the woods, that Dan would become the richest man there; that his invention was of immense value, and would supersede the telegraph. The fact assumed by my friend is not so.

Then my brother Edmunds fortified his argument with another statement. He said that Mr. Orton, the president of the Western Union Telegraph Company, scouted this thing, and did not recognize it until the fall of 1878; and it is printed in the brief (p. 234): —

> "Mr. William Orton, president of the Western Union Telegraph Company, had knowledge of the Bell telephone as early as April 7, 1877, as appears from the letter signed by him and others (complts, i, 270), and had his attention pointedly called to it by Mr. Pope, the 'special advisory electrical expert' of that company, and also of the Gold and Stock Telegraph Company, of which Mr. Orton was likewise president, yet he did not stir in the matter of attempting to acquire an interest under it till the summer or fall of 1878, as we learn from Mr. Pope's deposition (vol. 2, pp. 1285–1287, ans. 1, 2; p. 1428, ans. 310–314).
>
> "*Mr. Orton did not stir in the matter of attempting to acquire an interest under it till the summer or fall of 1878*"!!

That is put in italics in their brief. Now, if there were wanting any example of the fallibility of human memory, perhaps this one would be as striking as any that could be produced. Here is very able gentleman, Mr. Edmunds, employed to know the facts in this case, — paid to know them, bound to know them under his obligation to this Court, — an obligation that is as strong as if he had sworn to each statement. He has told you that he has read every word, line and paragraph; and he comes before this Court and makes those statements, no doubt, entirely sincerely, as the basis of his argument. But the fact is, that Mr. Orton, in April, 1877, signed the call for a meeting to hear Mr. Bell explain "*the commercial value*" of his instrument, in the city of New York; and at once, *in the summer of 1877*, set his expert at it, telling him that the Western Union must have it (complts, iv, 776–7). But above all, we have the fact proved that Dan Drawbaugh borrowed the Western Union Company's telephone at Harrisburg, *in the spring of 1878* (brief, pp. 221–279). Mr. Orton had then got their lines equipped in Harrisburg; and Dan borrowed the Phelps instrument to find out how it was made, in the spring of 1878, and learned how to make telephones from it. But, Mr. Edmunds has forgotten what he knew about it two weeks ago; what he was paid to know; and what he no doubt thought he did know; for Mr. Edmunds is a conscientious man, and would not make a statement that he did not believe to be true. Yet, his memory is so fallible, that he has forgotten in a week the very facts which were the vital foundations of his argument; and he came here and made an argument founded upon the assumption, that even Mr. Orton did not appreciate the telephone until the "summer or fall" of 1878.

If Mr. Edmunds can be so mistaken, — a man with a cultivated intellect, paid to know it, and who spent a year's time to learn it,— how much more likely to forget would be these boors, who were called to testify ten years after an event, and asked to tell about something which they had no interest in, and which never fixed itself in their minds, except as a matter of idle curiosity.

Mr. Hill. — The trouble with Mr. Edmunds was that he was accepting as true the statements of your expert, Mr. Pope.

Mr. Dickerson. — You are putting your foot into it again. If you want to see that explanation knocked down, I will do it for you. The expert, Pope, said, in his examination at first, that it was 1878. The master got it down so. He came back the next morning, and said, "There is a mistake here; it was 1877." Then you called him, and examined him on the 1877 date taken out of another record.

Mr. Hill. — Where is the evidence as to that?

Mr. Dickerson. — I tell you that that is exactly true. I do not want to take my time to chase up these things now, but I will, and it is true.

By a slip of the tongue, perhaps, or a mistake of the examiner, Mr. Pope said it was in 1878, on p. 1287, but on p. 1303 he corrected it and fixed the true date as 1877, and then reported the date of Mr. Orton's determination to have it as August, 1877, as he had testified in a deposition given in 1879 (complts, iv, 7757). There was no mistake about this, for Mr. Hill put in evidence that earlier deposition, and examined Mr. Pope on it as of the correct date (complts, ii, 1453); and in the very sentence in the brief in which he charged Mr. Orton as not doing the thing till 1878, they give a reference to Mr. Pope's deposition (p. 1427, x 310) in which you asked a question, and brought out the date of August, 1877, as the time when Mr. Pope was "working on his report" to Mr. Orton.

And it is enough to say that in the spring of 1878 this fellow was borrowing our instruments in Harrisburg. The telephone lines had then been established. It was the Western Union line then, because they infringed the patent, and spread the telephone upon their lines, with all the power which that great corporation had; and Mr. Orton was doing it in 1877. Mr. Orton, the president of the Western Union Company, was a great man; he saw at once, and he said, that his company must have this improvement; therefore his employé, Mr. Pope, was engaged on it, and he made a contract with Dolbear for the ideas which he had, in the summer of 1877; because they were building up their line with these outside patents and ideas, in order to give Mr. Bell an opportunity to prove his title; and he proved it.

Then my brother Edmunds said that what many men had sworn to must be accepted, notwithstanding any *conduct* that stands in the way. Well, sir, he would not act in that way in his own life; and no man else would. That which is to be believed must be consistent with the God-given laws that govern human conduct. No man can be believed who comes and tells you that which no other human being ever would do or ever could do, so far as human experience goes. The law has laid that down as a maxim. It has done it, not only for the protection of property, but for the preservation of truth. If it were not so, — if a gang of fellows could be picked up to swear away our rights, when the conduct of everybody connected with it had been exactly contrary to the theory on which they were swearing, where would be our rights, and where would be the truth?

Then my brother Edmunds said that it is impossible that an instrument like **B** can *look* so old unless *it is old*. Well, I have had this electro-magnet unscrewed for the purpose of answering that suggestion. Here is **B**. This block has been screwed down to a board, and I now remove it, and you see that the wood under the block is exactly the same old looking wood as the rest. If this had been screwed down on a new board, and it then had grown old, — and they want you to believe it is seventeen years old, — this covered part would have looked new and the exposed part would have looked old. It was screwed down on an old piece of board when the thing was made, as is evident on inspection.

Another thing. They tell you that Dan used that old battered tin can for *nine years* as his instrument. Let me show it to you. That tin strap over the can has never been taken off. There is one *tack* in it at each end, and neither has ever been drawn. You cannot put the tack back again in an old hole if once drawn; it must make a new one, or it will not hold, and *there is only one hole*. You cannot pull this can out from the strap, and put on a new bladder, and replace it again. That thing was made in 1876, after the *Scientific American* description of Bell's telephone. It was tried and thrown away; and just as fast as he could, Dan stepped right on in the track that was before him. He made the other thing, — the Reis instrument, — and then he made the other things of that kind that came to be the exhibits in this case, as fast as he saw them outside. That is the history of it.

Our résumé is that this man stands in the presence of a cloud of witnesses who must have known that he was the inventor, if he had been. His partners, men of character and capital, were all tied up with him together in that little building, and NONE OF THEM EVER SAW IT OR HEARD OF IT. He told Matthews that he was not the inventor. He told Weaver that he was not the inventor. He told Chellis that *he did not know* that he was the inventor. He wrote his own biography in 1878, and it was published, in which he did not claim to be the inventor of "*the telephone*," but only of "*several kinds of telephones*," which at that time he was trying to invent. When this quartette was formed, or before that time, they advised that Dan's devices were not worth spending $15 or $35 upon; that it was not worth while to go to the Patent Office and put in an application which would have stood as a bar to the statute of limitations, then running against his claim. Just look at it! Hill, this expert patent agent, coming there from Washington, having shown to him **D** and **E**, **H**, **L** and **M**, and all those things in existence before any of the Bell inventions had been made, so far as he knew, and certainly long before the Blake transmitter was thought of; and knowing, as he did know, that the statute of limitations was running against the claim, advising that it was not worth while to spend $15 on!!

Hill, Dan Drawbaugh, Chellis, Jacobs, Moffitt, and the rest stood around that table, and went away, after deciding that it was not worth while to spend $15 or $35 on Drawbaugh's inventions, whatever they were. Then, when there was a crowd assembled to rob Professor Bell of his invention by infringing it, then this same quartette came together and said, "Dan, give us three fourths of the title to your story. We will defeat Bell with it: you must do what swearing you can to kill him." Then they took $20,000, and this huge pile of stock, and have carried on this case to its present termination.

Against the inferences of that, against all the conclusions that the human mind draws from these premises, what have they to offer? Not a scrap of paper. Not a record. At best, nothing but the naked memory of uneducated boors, that eight, ten or twelve years ago, they saw all these things; yet no one of them has described them; no one understands how they work; no one pretends to; but they simply say that they saw the outside of the exhibit; and some of them say that they heard somebody else say, that they had heard somebody else say, that Dan Drawbaugh was the inventor. It does not rise to the dignity of a question. It is a roaring farce.

Sir, I stand here representing tremendous interests. I deeply feel the weight of the great responsibility that is resting upon me;

and I cannot leave the case without begging of you the most careful consideration of it; in view of the fact that these great bodies of vested rights are at stake, and that your decision either will spread consternation over the length and breadth of this land, or else it will assure the owners of this property in the protection of that title which they, relying on this man's conduct, have for years thought was safe. Look at Drawbaugh,— walking into our office, and borrowing our instrument, never saying a word against our rights, never opening his lips to claim them. Relying upon such conduct, they have invested their money; they had no doubt about the legal conclusions from that conduct, and they are now called upon to say why they should not be stripped of their property, because he, and his gang of loafers, come here and swear that they have seen things in years gone by which his partners think should defeat the title under which these owners have invested their money and thus far have been protected in their rights. I have done.

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JAN [illegible]
JAMES. H. [illegible]

IN THE

Supreme Court of the United States.

OCTOBER TERM, A. D. 1886.

THE PEOPLE'S TELEPHONE COMPANY ET AL.,
Appellants,
vs.
THE AMERICAN BELL TELEPHONE COMPANY ET AL.,
Appellees.

THE OVERLAND TELEPHONE COMPANY ET AL.,
Appellants,
vs.
THE AMERICAN BELL TELEPHONE COMPANY ET AL.,
Appellees.

APPELLANTS' BRIEF ON THE DRAWBAUGH EVIDENCE.

GEORGE F. EDMUNDS,
DON. M. DICKINSON,
CHARLES P. CROSBY,
LYSANDER HILL,
T. S. E. DIXON,
HENRY C. ANDREWS,
MELVILLE CHURCH,
OF COUNSEL FOR APPELLANTS.

BARNARD & GUNTHORP, LAW PRINTERS, 44 & 46 LASALLE ST., CHICAGO.

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vs.
THE AMERICAN BELL TELEPHONE COMPANY ET AL.,
Appellees.

STATEMENT OF ERRORS.

1. The court below erred in holding the Bell patents in suit, or either of them, valid.

2. It erred in holding said patents, or either of them, to have been infringed by the defendants, or any of them.

3. It erred in holding that Daniel Drawbaugh was not the first and original inventor of the inventions here in suit.

4. It erred in not holding Elisha Gray to have invented the electric speaking telephone, in its variable resistance

5. It erred in not holding the Bell patent of March 7, 1876, here in suit, to be fraudulent and void, in view of the evidence as to fraudulent changes in the application therefor, and the fraudulent introduction of Gray's inventions into said application, while pending in the patent office.

6. It erred in not holding the Bell patent of January 30, 1877, here in suit, to be fraudulent and void, in view of the evidence as to the fraudulent introduction of Elisha Gray's said inventions into the same.

7. It erred in not holding Bell to have surreptitiously and unjustly obtained both of said patents for that which was in fact invented by another (to wit: by Elisha Gray), who was using reasonable diligence in adapting and perfecting the same.

8. It erred in not holding Bell to have surreptitiously and unjustly obtained both of said patents for that which was in fact invented by another (to wit: by Daniel Drawbaugh), who was using reasonable diligence in adapting and perfecting the same in his various improved instruments.

9. It erred in not dismissing the appellees' bill for want of equity and right, in view of the frauds shown by the appellees' own evidence to have been perpetrated upon the Patent Office, Elisha Gray and the public in the procurement of the patents, and remaining in the patents, on which said bill is founded.

10. It erred in construing said patent of March 7, 1876, here in suit, to cover anything more than a magneto-electric current generated by the vibration, by sound waves, of a body of inductive material in the presence of a body susceptible of receiving induction therefrom; and it further erred in not holding such a patent for a *current* to be a

patent for an "effect," "mode of operation" or "principle," and therefore void.

11. It erred in not holding said patent of March 7, 1876, to be limited to the described apparatus of its figure 7—there being, as the appellees contend, no "art" then known, and there being no equivalents for this apparatus described in the specification.

12. It erred in not holding said patent of January 30, 1877, to be invalid and void, by reason of its claiming matters described and shown, but not claimed in Bell's prior patent of March 7, 1876, the application not having been filed till after the former patent was issued, and said matters not having been reserved in said prior patent as matters to be afterwards applied for, but having been abandoned to the public by describing and showing without claiming them, in said prior patent.

13. It erred in not limiting the scope of the claims of the patent of January 30, 1877, here in suit, to mere improvements in the form of the parts mentioned in said claims.

14. It erred in holding that the specification of Bell's patent of March 7, 1876, describes the speaking telephone invention with the clearness, fullness and exactness which the statute requires in such cases; and that the patent is not invalid for want of a proper description and specification of said alleged invention.

15. It erred in holding that Bell, in the sense of the patent law, completed or made any invention of an electric speaking telephone before a date later than March 7, 1876; and, therefore, in not holding the patent void, as being for an invention not made, at or prior to its date, by the patentee.

16. It erred, throughout its opinions in the case

against the People's Telephone Company, in treating of the evidence as to Drawbaugh's priority of invention, by ignoring, misconstruing, misstating, and misunderstanding the evidence; by assuming things of which there was no evidence, or which were contrary to the evidence; by misunderstanding and misapplying the law; and by attributing different degrees of probative force to the same kinds of evidence accordingly as it found the same on the one side or on the other side of the case. These errors are too numerous to be set out here in detail, but reference for them is to be made to appellants' brief on the Drawbaugh evidence herewith filed, pages 277 to 311 inclusive, where the same are set forth in detail.

L. HILL,
Of Counsel for the People's Telephone Co.,
and the Overland Telephone Co., Appellants.

IN THE

Supreme Court of the United States.

THE PEOPLE'S TELEPHONE CO. ET ALS.,
Appellants,
vs.
THE AMERICAN BELL TELEPHONE CO. ET ALS.,
Appellees.
No. 1164.

THE OVERLAND TELEPHONE CO. ET AL.,
Appellants,
vs.
THE AMERICAN BELL TELEPHONE CO. ET AL.,
Appellees.
No. 1165.

THE SUIT AND ITS DEFENSES.

The appellants here were the defendants below. The suits are founded upon the patents granted to Alexander Graham Bell, No. 174,465, dated March 7, 1876, application filed February 14, 1876, for "Improvement in Telegraphy," and No. 186,787, dated January 30, 1877, for "Improvements in Electric Telephony."

The defense is, first, a denial of the validity of both of said patents, on the ground that Alexander Graham Bell was not the original and first inventor of any of the inventions claimed therein, constituting or applicable in con-

nection with electric speaking telephones, but that Daniel Drawbaugh, of Eberly's Mills, otherwise known as Milltown, Cumberland county, Pennsylvania, was the original and first inventor of all such inventions and improvements described and claimed in said two patents, or in either of them.

Secondly, a denial that either of the said Bell patents is infringed by the defendants.

Thirdly, a denial that either of said Bell patents is valid in law.

Fourthly, a denial that Bell had achieved the invention of the electric speaking telephone at the date of his patent of March 7, 1876.

Fifthly, a denial that the matters decribed in said patent of March 7, 1876, were original with Bell. The appellants will maintain that he derived many of them from Elisha Gray, a prior inventor of the electric speaking telephone.

Sixthly, a denial that the matters described in Bell's patent of January 30, 1877, were original with Bell. The appellants will maintain that he derived many of them from said Gray.

Seventhly, a denial that Bell had any right to incorporate into either of his said patents any principles, inventions, methods, or devices, knowledge of which he derived from said Gray, and that his patents have any validity, in view of the fact that he so appropriated Gray's inventions.

A separate brief will be filed herewith, in which all the questions raised by the appellants, except the Drawbaugh defense, will be discussed independently.

The Drawbaugh defense alone will be discussed in the present brief.

This division of the subject matters of defense is adopted for greater clearness and convenience, both to court and counsel.*

I.

SKETCH OF DANIEL DRAWBAUGH'S HISTORY, CHARACTER, POVERTY, AND INVENTIVE INGENUITY.

Daniel Drawbaugh was born in the year 1827, and has lived nearly all his life in the little village or hamlet of Eberly's Mills, otherwise called Milltown, Cumberland county, Pennsylvania, on the Yellow Breeches creek, about three miles south-east from Harrisburg. His residence in that village has been continuous from a period before the rebellion to the present time, with the exception of the one year, from April 1, 1876, to April 1, 1877, when he resided at Mechanicsburg, five miles away, but worked in his shop at Milltown, going home Saturday evenings and returning to his shop Monday mornings.

(D. Drawbaugh, D. Vol. 2, pp. 749 to 1027, answers 2, 3, 4, 5, 547, 548, 580, 633, 1474; J. B. Drawbaugh, Vol. 1, p. 593; Fettrow, Id. p. 347; Springer, Id. p. 182, Ans. 6, 55, etc.)

From the year 1856 to the fall of 1867 or winter following, he had his workshop in the basement or first story of a house closely adjoining Eberly's grist-mill, but at the latter date he began to occupy a shop two or three

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hundred yards below, on the bank of the Yellow Breeches and has occupied it ever since. (Id. Ans. 8, 10, 11, 12, 13; H. B. Eberly, D. Vol. 1, p. 287, Ans. 40.)

From 1856 to April 1, 1868, he lived in the house adjoining the grist-mill; at the latter date he purchased and occupied a house on the opposite side of the road, not far from the grist-mill; this latter property he sold to D. Fettrow in the spring of 1876, when he moved to Mechanicsburgh, and on his return from Mechanicsburg in the spring of 1877, he moved into a house opposite the grist-mill and occupied it one year, after which he again moved into the house adjoining the grist-mill, and has lived there ever since.

(D. Drawbaugh, Id., Ans. 6, 8, 479, 480, 548, 1474, 1475.)

These various localities, *as they existed in the year 1872*, are fairly shown by the map of of Eberly's Mills and vicinity, appended at the end of complainant's exhibits.

Mr. Drawbaugh's school education was limited. He attended the common schools parts of three to five winters, but ceased to attend school at the age of fifteen or sixteen.

(D. Drawbaugh, Id., p. 866, Ans. 619, 620, 621.)

His opportunities for acquiring scientific and mechanical information from printed publications, have been limited. He was a reader of the Scientific American at an early period (Id., Ans. 809, p. 899) (but let his subscription run out about 1869 or 1870, from want of money; Ans. 1569, 1570), and had in his possession a few books (same answer and answers 1009, p. 939, and 1017, pp. 941, 942), among which were Comstock's Philosophy, Parker's Philosophy, Youman's Chemistry, two volumes of Tomlinson's Cyclopedia of Useful Arts, and a publication on the international exposition of 1851; and prior to the spring of 1860 he attended certain courses of lectures on physics, delivered by Prof. Heiges, in a school-house near Milltown, and *was, even at that early date*, contemplating the transmission of speech through a telegraphic wire by electricity, and believed that it could and would be accomplished. (Prof. S. B. Heiges, D. S-reb., pp. 95–97, answers 1–14.)

He was "an enthusiast on the subject of physics at that early time." (G. W. Heiges, C. Vol. 2. p. 1095, Ans. 21.) He was familiar with the Everitt Acoustic Telegraph, and with the Leon Scott phonautograph, from about the end of the year 1863 (D. Vol. 2, p. 1067), and with the Ries telephone in the fall of 1876 (Id. pp. 1056, 1064, 1067.) "The subject of electricity seemed to be his hobby." (Dr. C. E. Updegraff, D. Vol. 2, p. 1087, Ans. 33.) And this is confirmed by all the witnesses in the case, both for the complainants and the defendants.

From his boyhood, he was a person of remarkable mechanical ingenuity and natural skill. At the early age of thirteen, he made a rifle for Daniel Balsey (Balsey, D. Vol. 1, p. 195, Ans. 29) and at a later date was exceedingly skillful in wood-working. (Id. pp. 195, 196, Ans. 31, 42, 43.) When about ten or twelve years old, he made part of a clock; and at the age of from fifteen to seventeen he made a small steam-engine and an automatic machine for sawing wagon-felloes, the latter being of his own invention. (D. Vol. 2, p. 895, Ans. 790.) About the years 1857–9 he constructed and operated photographic apparatus, making even the lenses himself. (D. Vol. 2, pp. 900, 901.) He constructed, at one time, for his own use, a solar transit, by which to test the regularity of his magnetic clocks (Id., pp. 957, 971), and, at another time, a machine for wrapping electric wire (Id., p. 960.). He made his own galvanometers (Id., pp. 939 to 941). Nearly all the witnesses in the case bear testimony to his skill as a workman, and even Weaver, hostile as he is, was obliged to declare (C. Vol. 1, p. 380, Ans. 28) that Drawbaugh, in 1868, had such a reputation as a machinist "that very few men would venture to offer advice to him." He was a "first-class" workman. (J. C. Smith, D. Vol. 1, p. 342, Ans. 95.) He was applied to by others to invent machines for them (Weaver, C. Vol. 1, p. 377, Ans. 9; D. Drawbaugh, D. Vol. 2, p. 968, Ans. 1134; same page, Ans., 1133; p. 969, Ans. 1140), and, in consequence of such applications invented not only the tack machine for Patton, the paper-bag machine for Singiser, and the machine for stemming grapes for Hertzler, but (D. Vol. 2, p. 898, Ans. 804) a great variety of machines about 1867 for the pump company and (Id., p. 970, Ans. 1144), a large number of machines and tools about 1874 or 1875 for the axle company. A considerable number of his inventions are enumerated in his answer 791, D. Vol. 2, p. 895, and again on pp. 1061, 1062, where he testifies to their successful mechanical operation.

"He was looked upon as a man who could invent most anything." (D. H. Good, D. Vol 1, p. 508, Cross-ans. 22.)

"He was a great mechanical genius." (*Morley*, complainants' witness. C. Vol. 2, p. 1553, Ans. 9.)

"He was a great inventor—I knew that." (Edward Nichols, complainants' witness, C. Vol. 1, p. 864, Ans. 102.)

In Wing's History of Cumberland county, Pennsylvania, published in 1879, he is referred to as "An inventive "genius of whom our country may feel justly proud." (C. Vol. 1, p. 707.)

Like most great inventive geniuses, he was not equally great as a financier, the continuous and intense mental application necessary to the conception and development of inventions, and the overcoming of mechanical obstacles, rendering it almost impossible for them to give much, if any, attention to the acquisition and successful management of property. His wife testifies (D. Add. Proofs, p. 224, Ans., 39–42) that he was a very poor business manager, very negligent about collecting his dues, easily letting money slip through his fingers, and of such generous impulses that, even when very poor himself, he was unable to say "No" to any demand for charitable or other purposes. At the opening of the rebellion he was manufacturing his patented stave machinery and selling it principally in the south. The beginning of hostilities caught him with his machines, unpaid for, in the south, and his liabilities in the north, and he was thereby bankrupted. (D. Vol. 2, p. 843, Ans. 490.) He lived in a small hamlet, in the midst of an agricultural community, where there was little or no business, and, from his failure until the summer of 1867, earned his subsistence by doing such small jobs of repairing as came to hand. During that period he was not doing a paying business, was poor, and in need of a good many necessary articles. (D. Vol. 2, pp. 843, 844, Ans. 491, 492.) His finances were very low, and he was considerably in debt. (Id., p. 832, Ans. 427, 428.) His brother, Esquire John B. Drawbaugh, testifies (D. Vol. 1, pp. 594, 595) as follows:

"Q. 160. You have referred to your brother Daniel's being poor and in debt, at the time when he sold his faucet and pump to Gardiner, Gorgas and others; do you know anything about his meeting with heavy losses, for a poor man, and becoming involved in debt in consequence of it, by a transaction which occurred about the beginning of the rebellion, in the latter part of 1860, or early part of 1861?

"A. I do.

"Q. 161. Do you remember what amount of money Dan lost in that transaction?

"A. I heard him say about that time that his expenses and labor on manufacturing those machines was about twenty-five hundred dollars.

"Q. 162. That loss was occasioned by the sale of machines and patent rights in the south, just before the rebellion, the proceeds of which could not be collected by reason of the war; was it not?

"A. Yes, sir.

"Q. 163. Do you know whether at the time when he sold his faucet and pump to Gorgas and others, he was still embarrassed by debts growing out of that old transaction?

"A. He was."

He never received a cent of that money after the starting of the rebellion. (D. Vol. 2, p. 843, Ans. 490.)

In 1867 his financial prospects brightened a little, and he undoubtedly thought himself at last on the road to prosperity; but his hopes were delusive and his prosperity short-lived. By the latter part of 1869 he was substantially out of employment, and as poor as ever. The circumstances were as follows:

In 1866 he had patented a faucet and pump. Prior to May, 1867, he had sold one-half of the faucet invention to A. H. Gardner for $1,000. He did not get the money for two years thereafter, but, finally, about April 1, 1869, he raised the money on Gardner's note by becoming surety upon it himself, getting some of his friends to endorse it, and getting it discounted. Gardner did not pay the note, and the result was that afterwards, in April, 1872, judgment was entered against the principal and sureties, *and a lien of $1,000 and interest thereby became in force upon any property that Drawbaugh had.* (D. vol. 2, pp. 833, 834.) At the time when he received this $1,000 his father and mother were very aged, helpless and poor, and Daniel Drawbaugh with his brother Henry and a brother-in-law united together to buy and furnish them a little home, each agreeing to contribute his quota to the expense. Daniel applied the $1,000 to this excellent purpose; Henry furnished his quota; but the brother-in-law was delinquent and Henry had to make up the deficiency, as Daniel was unable to contribute any further. The transaction cost Henry $2,700. At the death of their father in December, 1878, the property had so depreciated in value and was so exhausted by the old gentleman's debts that there remained not one cent for the heirs. Henry had to bury his father and to pay his remaining debts, Daniel being unable to assist, by reason of his own poverty. The $1,000 received from the Gardner note, was, therefore, lost, and Daniel Drawbaugh was involved in a liability of $1,000 and interest as surety on the note. The whole transaction is detailed in the testimony of Daniel Drawbaugh (D. vol. 2, pp. 834, 835) and Henry F. Drawbaugh (D. vol. 1, pp. 399, 403).

It appears from the testimony of W. L. Gorgas (D. Vol. 1, p. 647) and others, that in May, 1867, Mr. Drawbaugh and five of his neighbors bought from him his patent right on pumps at the price of $6,000, toward which the other five contributed $5,000 and he contributed $1,000, so that he was to receive for his patent right $5,000 and a one-sixth interest in the stock of the company. The company purchased machinery, rented an old clover-mill two or three hundred yards below

Eberly's grist-mill, employed Drawbaugh as superintendent, and commenced operations. In the fall of 1867 Gardner and his associates in the faucet united with the pump company, and its membership was thereby increased to nine persons. Drawbaugh moved his own tools into the clover-mill and has ever since occupied it as his workshop. It was an old wooden building, having a basement or cellar, two stories and an attic, and had in the basement a small water-wheel for driving the machinery.

This company held its first meeting on May 24, 1867, and held meetings pretty regularly till December 5, 1870, Between the meetings of October 22, 1870, and December 5, 1870, there was a meeting at which it was decided to suspend operations, and the company then and there substantially closed its business operations. (C. Vol. 2, pp. 1147, 1148, and answer 128, p. 1151.) It held only two meetings after December 5, 1870, viz.: one July 19, 1873, (C. Vol. 2, p. 1148, and answer 126, p. 1150), on which date the company, having then recently sold out its property to Hauck Brothers & Co., went into liquidation (Id., p. 1131, and answer 20), and one on May 1, 1876, for final settlement of all its matters. (Id. and also Gorgas, D. Vol. 1, p. 647 *et seq.*) The business of the company, thus suspended in the fall of 1870 and never resumed, was financially unsuccessful. No dividends were ever declared (Gorgas, Id., answer 16, p. 649, and 29, p. 653), but larger assessments were made upon the members during the period of its active operations. Drawbaugh did not receive his $5,000 in cash at the time of forming the company, but received a portion in cash and the balance in notes from the other members, which notes were paid along from time to time, in instalments, during

1867 and 1868. (Drawbaugh, D. Vol. 2, pp. 837 to 842.) The assessments made upon him by the company amounted to $2,186.33, against which he was credited on July 25, 1870, with his labor to the amount of $885. (Gorgas, D. Vol. 1, answer 23, p. 651.) He actually paid into the company cash assessments of $1,210 (Gorgas, Id., answers 20, 21, 22), and contributed his labor for several years in lieu of paying the balance of his assessments in cash. All the money and other articles that he received from the company on his wages account during the five years from the beginning of its operations, were as follows:

In the year 1867	$115 00
" " " 1868	13 20
" " " 1869	37 39
" " " 1870	13 38
" " " 1871	62 58

Believing himself in the fall of 1867 to be entering upon a condition of comparative prosperity, he purchased the dwelling house and blacksmith shop about one hundred yards west from Eberly's grist mill, for the sum of $2,310.00, on which he at the time paid $2,000 out of the money received from the sale of the patent right to the company. (D. Vol. 2, Ans., 478 to 485, pp. 841, 842.) About the same time he paid old debts to the amount of $1,000 or *more* out of the same proceeds. (Id. Ans. 488, p. 843; and see testimony of J. K. Taylor, D. Vol. I, pp. 633, 634, Ans. 1 to 5.) He was unable to pay in full the purchase money for his homestead, but left a judgment of about $300, in favor of one Neidhamer, standing as a lien upon it. (Id., p. 842, Ans. 484.) He was obliged to put repairs upon the house, the amount of which he cannot state, but estimates at between three and four hundred dollars. (Id., p. 849, Ans. 521, 522.) He also had to contribute for his parents, besides the $1,000 for a home, other moneys for furnishing it and for necessary articles for their use, to the amount of not less than four hundred dollars in all. (Id., p. 844, Ans. 493, 494, 495.)

It appears, therefore, that from the beginning of May, 1867, to the end of the year 1870 he received—

From pump company....................	$5,000 00
From Gardner note discount..............	1,000 00
From company on labor account..........	179 27
Total receipts....................	$6,179 27

and that he paid out—

For old debts........................	$1,000 00
For homestead........................	2,000 00
For repairs on homestead...............	300 00
For parents' homestead.................	1,000 00
For parents..........................	400 00
For assessments.......................	1,210 00
Total........................	$5,910 00
Leaving a balance of..................	$ 269 27

to be applied for his own support and that of his family in a period of nearly four years. He did a little work in the shop on his own account during this period (D. Vol. 2, p. 846, Ans. 506), and rented a portion of his house to Daniel Fettrow from the spring of 1868 and for eight years thereafter, for which Fettrow paid him $80 for the year 1868, and $110 per year after that time. (Fettrow, D. Vol. 1, pp. 353, 354.) Assuming that he earned $100 per year by these odd jobs, which is probably too large an estimate, we find that his resources from May 1, 1867, to the end of 1870, for the support of himself and family, were:

Cash from C. applied for that purpose.......	$269 27
Rent received from Fettrow................	320 00
Earned by odd jobs......................	360 00
Total..............................	$949 27

about twenty-two dollars per month—a little over seventy-five cents per day.

During that period he had no other financial resources than those hereinabove set forth (D. Vol. 2, p. 845, Ans. 500).

Yet, in all his career from 1860 to 1880, this period, consisting of the years 1867, 1868, 1869, and perhaps the early part of 1870, was, financially, the "flush" period of his life!

The money from his associates in the company came in driblets, and he had to borrow money to get along, in one instance (through the aid of Mr. Gorgas) making a loan of $400 dollars or more from David Ditlow, which encumbered him for years afterward. (Id. pp. 845, 846, 847, 848, 849.) This loan he was compelled to make, in order to meet an assessment and save his interest in the company (Id. Ans. 509, p. 847), and he probably used some of it for the support of his family, as he was at that time hard pressed for their support. (Id. p. 847, Ans. 510, 511.) This note was curtailed and renewed for $200, on April 4, 1870, payable in one year (Id. p. 849). In 1874, fifty dollars of it still remained due (Id. p. 849), and the debt was finally canceled in 1881. (Ans. 520, p. 849.)

At the end of the year 1870, his financial situation was, therefore, substantially as follows: He owned a homestead worth $2,300 four years before, which was now encumbered to the amount of more than $1,900, by reason of the $300 Neidhamer lien for a portion of the original purchase money, the $600 lien of William Drawbaugh (D. Exhibits p. 29), and the $1,000 judgment note given April 1, 1869 (D. Exhibits, p. 39), and known as the Gardner note, to which reference has already been made; he was out of employment, and hard pressed to support his family; and he owed David Ditlow $200, and probably had other debts to a considerably greater amount. One note to Malehorn, dated March 29, 1870, for $133.97, and upon which suit was brought, appears in D. Exhibits, p. 32.

During the years 1871, 1872, and down to July, 1873, when the company's property was sold out to the Haucks, he had no regular and steady employment and no regular and steady income, but subsisted upon what odd jobs he could get to do in the shop. (Ans. 508, p. 547, D. Vol. 2.) At one time, in 1871 or 1872, he tried, in connection with Jacob M. Sadler, to eke out his slender means of living by making a few hydraulic rams, Sadler furnishing the small capital for the enterprise, and getting orders for the rams, and Drawbaugh doing the work; but the business amounted to little or nothing and was soon abandoned. (See W. Sadler, C. Vol. 1, pp. 1036–1054; Ans. 26–33, 87–97, 119.) During this period he was subjected to extraordinary troubles, both financial and domestic. In November, 1871, he lost two of his children by death—Ida, aged about nine years, and Emma, aged about fifteen (D. Vol. 2, p. 751; C. Vol. 1, pp. 905 to 908), —and for a long time thereafter had another child ill and so emaciated by disease as to attract people to the house from curiosity to see it (Z. Bowman, D. Vol. 1, pp. 612, 613; H. F. Drawbaugh, Id., Ans. 52, p. 420; Karns, C. Vol. 1, Ans. 163, p. 905), and another child substantially an invalid. (D. Vol. 1, Ans. 52, p. 402; D. Vol. 2, Ans. 17, 18, p. 751.) His family were scarcely ever without sickness, and he was too poor to procure them the medicines which they required (H. F. Drawbaugh, D. Vol. 1, Ans. 52, p. 402.) He was unable to pay the physician who attended his family, and was sued by him on February 10, 1873, for a bill of $122.67. (D. Vol. 2, pp. 852, and record of judgment in D. Exhibits, pp. 51, 52.)

On July 19, 1873, he received $425 from the distribution of the proceeds of sale of the company's property to the Haucks (Gorgas, D. Vol. 1, p. 654, Ans. 32). Of this sum he was immediately compelled, on August 1st, 1873, to pay $45 on Dr. Bowman's judgment for medical attendance (D. Vol. 2, p. 852) and nearly all the balance was paid out on the old Neidhamer judgment lien for $300, of more than six years' standing, which the holders were pressing at the time. (Id. p. 858.) This judgment he had not paid off before that time because he had not the money (Id. Ans. 531, p. 851), and interest had accumulated on it at the time when it was paid. (Ans. 532, p. 851.)

The interest on the Neidhamer judgment was at least $18 per year, and that on the Ditlow note was $12 per year (D. Vol. 2, p. 848, Ans. 517), to which must be added his taxes, and, if he was able to insure, his insurance and any interest accruing on his other debts.

The small sum received from the company's distribution in 1873, was, therefore, absorbed as soon as received in quieting the claims of pressing judgment creditors and note holders. It is possible that a small portion of it was paid on the David Ditlow note, which appears to have been running for the original amount of $200 in April, 1873, (D. Vol. 2, p. 848, Ans. 517, endorsement of interest on that date) but was reduced to $50 as early as April 9, 1874 (see note in curtail on p. 849, D. Vol. 2).

From July, 1873, to the time when he moved to Mechanicsburg, about April 1, 1876, he was not making money enough to pay his necessary expenses and keep even with the world, but was getting deeper and deeper into debt all the time. (D. Vol. 2, p. 854, Ans. 547.)

In 1874, Capt. J. A. Moore, Jacob Kline, Wilson Bear and M. M. Grove formed a co-partnership for the manufacture and sale of Kline's patent axles, which co-partnership was known as the "Harrisburg Axle Co.," or "M. M. Grove & Co.," and is generally referred to in the evidence as the "Axle Co." The co-partnership articles were signed Dec. 23, 1874, and it was dissolved on February 9, 1876. (Moore, D. Vol. 1, p. 614.) Moore and Grove, after the dissolution, ran the concern on their own account for a few months, and then Moore took the assets and assumed the debts, and closed it out. This Axle Co. rented from the owners the old clover mill or shop, then occupied by Daniel Drawbaugh as a workshop and used it as their manufactory. They put some new machinery, adapted to their purposes, into the shop *in March, 1875*, (see Moore D. Vol. 1, p. 617; Harman K. Drawbaugh, Id. p. 555; John Wolf, who hauled the machinery to the shop, and exhibits a book account of his charges therefor, D. Vol. 2, p. 674; Daniel Fettrow, Vol. 1, p. 348; Augustus Kahney, D. S.-reb. p. 258, Ans. 38.) The Axle Co. went to work immediately after getting their machinery, in the latter part of March, 1875, (H. K. Drawbaugh, D. Vol. 1, pp. 554-5) and ceased manufacturing axles in the spring of 1876, although they repaired a few reapers, etc. up to harvest (about July 1), 1876. (Moore, Id. p. 615, Ans. 8, 9, 10.) They employed Daniel Drawbaugh to some extent from May 28, 1875, to March 31, 1876, (Moore, Id. pp. 620, 621), and paid him in 1875, $310.22, and in 1876, $143.84, for work done by him.

All along from the time when his great financial distress commenced, during the operations of the Pump and Faucet Company, in 1869 and 1870, Mr. Drawbaugh was desirous of selling his equity in the homestead and using the proceeds to pay off his debts, patent his inventions and get into business, and actually offered it for sale a number of times to different parties, but his wife would not give her consent to sell the house except for the purpose of purchasing another. (D. Vol. 2, p. 867, Ans. 629 to 633; and see his wife's testimony, D. Add. Proofs, pp. 224, 225, where she swears that he frequently importuned her to consent to the sale in order to get means to patent the telephone invention, but she resolutely refused.) The property was worth about $2,000 and was encumbered by judgment liens to the amount of over $1,000, and, with his wife refusing to release her right of dower, it was manifestly impossible for him to sell it or borrow money upon it. In his extreme poverty, she regarded the possession of this home as her only safeguard against the poor-house.

She was bitterly opposed to his spending his time in experimenting and inventing (D. Vol. 1, H. F. Drawbaugh, p. 401, Ans. 46, 47; Daniel Drawbaugh, D. Vol. 2, 831, Ans. 418; Harman K. Drawbaugh, D. Vol. 1, p. 567, Ans. 133; Holsinger, Id., p. 365, Ans. 51, 52; Mrs. Brenneman, D. S-r, p. 106, Ans. 29; Mrs. Brown, Id., p. 164, Ans. 11; Springer, D. Vol. 1, p. 186, Ans. 42, 43;

Chellis, Id., p. 526, Ans. 16; Fettrow, Id., pp. 357–8, and Mrs. Drawbaugh, D. Add. Proofs, p. 222). When he proposed, therefore, to sell the property and invest a portion of its proceeds in securing his inventions, including the telephone (Ans. 631, 632, D. Vol. 2, p. 867), it is no wonder that she declined to give her consent, and resolutely determined that the property should only be exchanged for another home.

In this situation Mr. Drawbaugh decided, in 1875, to effect, if possible, an exchange of this property for a house in Mechanicsburg, hoping to get some more regular employment in that village (D. Vol. 2, p. 867, Ans. 633). He therefore bargained with his tenant, Daniel Fettrow, in August, 1875, to sell the Milltown property to him for $2,200, clear of incumbrances (Fettrow, D. Vol. 1, p. 348, Ans. 13; p. 355, Ans. 75, 76). Fettrow had the title examined, and found the $1,000 lien, and therefore paid Drawbaugh, on getting the deed, about April 1, 1876, only $1,200—of which $50 was paid at the time of the agreement to buy, in August, 1875; $100 was paid on January 28, 1876, and the balançe, $1,050, was paid about April 1, 1876. (Fettrow, *id.*, p. 355; D. Drawbaugh, D. Vol. 2, pp. 854, 855, 856.) Drawbaugh at the same time bought a house in Mechanicsburg, from E. W. Wise, for $1740, of which $1000 was paid in cash, April 1, 1876, and the balance, $740, was to be paid in three annual installments, one payable April 1, 1877, one April 1, 1878, and the remaining one April 1, 1879; all of which deferred payments were secured by judgment notes which were immediately docketed on judgments entered up on them as liens on the Mechanicsburg property (D. Vol. 2, pp. 857, 858, and see Defts. Exhibits, pp. 57, 58, 59, 60.) In the exchange of homesteads, therefore, Drawbaugh received from Fettrow $1200 and paid out to Wise $1000, leaving $200 in his own hands, of which $200 fifty dollars came to hand in August, 1875, and one hundred and fifty dollars on April 1, 1876. He also sold an old cider mill in the summer or fall of 1875, to Hake, a miller, for which he received a small sum of money, taking the balance of the amount in flour and mill-feed. (D. Vol. 2, p. 1063, Ans. 1652–3.) Drawbaugh's pecuniary receipts for the year 1875 were, therefore, so far as we can trace them:

Rent Collected	$110 00
Received on sale of house	50 00
" for Cider Mill, estimated	15 00
" from Axle Co., for wages, etc	310 22
Total	$485 22

In May, 1876, the Haucks who had bought out the old Pump and Faucet Company, on July 1, 1873 (C. Vol. 1, p. 789, Ans. 17) and had manufactured faucets there to some extent, from July 15, 1873, to August, 1874 (Id. p. 190, Ans. 32), and perhaps to a trifling extent afterwards (Id. p. 791, Ans. 30, 31), removed their machinery to Mechanicsburg (Id. p. 789, Ans. 21).

On May 1, 1876, in a final settlement of the old Pump and Faucet Company's accounts, Drawbaugh was allowed and paid $51.13, for labor done by him since the settlement of July 25, 1870. (Gorgas, D. Vol. 1, pp. 651, 652, Ans. 23, etc.) This sum, with the amount paid him for wages by the Axle Co., the amount received from Fettrow and not paid over to Wise, and Fettrow's rent for the year ending April 1, 1876, is the only money we can trace into his hands in the year 1876, the receipts for that year being therefore as follows:

Rent collected	$110 00
Axle Co. for wages	143 84
Cash from Pump Co	51 13
Cash from Exchange of Property	150 00
Total	$454 97

Out of the moneys received in 1876, he paid the balance, about $80, of Dr. Bowman's judgment, and also a judgment of D. H. Good, amounting to about $38, and a bill of Dr. Criswell of about $40, thus reducing the amount available for the support of his family, to $296.97. (D. Vol. 2, p. 859; also D. Exhibits, pp. 51, 55). The expenses of moving to Mechanicsburg, making searches of title and conveyances, &c., undoubtedly further reduced this sum to not over $275. He has no means of ascertaining what other debts he was obliged to pay in 1875 and 1876, but thinks he paid George Leonard, owner of Eberly's grist mill, from $40 to $60. (Id. p. 859.) We can, therefore, readily appreciate the force of his statement in answer 547, (D. Vol. 2, p. 854) that, from July, 1873, to the time when he moved to Mechanicsburg, about April 1, 1876, he was not making money enough to keep his family, but was getting deeper and deeper into debt all the time; and his statement (Id. p. 859, Ans. 579) that, in three weeks from the time when he received the $150 from Fettrow, on April 1, 1876, he had not a cent of it left; and are prepared to believe his further statement in answers 581, 582 (D. Vol. 2, p. 859), that, from April 1, 1876, to the latter part of March, 1878, he "needed money very badly," and was not able to earn enough "to support his family."

From April 1, 1876, till the beginning of this suit, in the fall of 1880, Mr. Drawbaugh had no regular employment for wages. Along towards the spring of 1878 he succeeded in inducing Jacob E. Shettel, Jacob H. Grissinger, and Theodore Grissinger to form, with him, a firm (referred to in the evidence as the Clock Company) for the patenting and manufacturing of his magnetic clock invention, they paying him, on April 1, 1878, $500 for their interest. They commenced operations on that day, in the shop occupied by him, he devoting his time to the work and looking to the prospective profits for his compensation. The business ran along in a slow way for about a year and made no profits, when the Grissingers and Shettle sold out to E. W. Chellis, who had become interested, in January, 1879, in a little improvement in faucets invented by Mr. Drawbaugh. (Shettle, D. Vol. 1, pp. 207 to 224, Ans. 13, 14, 37, 38, 39-44, 62-66, 88-92, 126, 137, 154-161; Chellis, Id., 525, Ans. 1.) Chellis, when he acquired his interest, with Dr. Moffit and Drawbaugh, in Drawbaugh's faucet improvement, paid Mr. Drawbaugh, on January 7, 1879, $250 therefor (Chellis, Id., p. 525, Ans. 1.) These two sums $500 from the clock company, on April 1, 1878, and $250 from Chellis, on January 7, 1879—are all the sums of money, amounting to over a few dollars, that we can trace into Mr. Drawbaugh's hands from the year 1876 to the beginning of this suit, in the fall of 1880. During this long and cheerless period, Mr. Drawbaugh, already deeply in debt, was obliged to subsist upon such little jobs of repairing, etc., as he could get to do, and upon the very small portion of the moneys received from the clock company, and from Chellis, that his creditors left in his hands for that purpose. He had moved back to Milltown about April 1, 1877, and such rents as he may have received from his Mechanicsburg house were necessarily applied to renting a home for his family in Milltown. He had no other resources.

It will be remembered that, from and after April 1, 1876, three judgments were now standing against him in favor of E. W. Wise, and threatening his Mechanicsburg house, upon which they were liens, viz: one for $256.66 and interest, payable April 1, 1877 (D. Exhibits, pp. 59, 60), one for $246.67, with interest, payable April 1, 1879 (Id., pp. 56, 57), and one for $246.67, with interest, payable April 1, 1879 (Id., pp. 57, 58). He seems to have scraped together, or borrowed, $200, paid on the second of these judgments, April 9, 1877 (Id., p. 56). Out of the money received from the clock company, on April 1, 1878, he paid $300 to cancel this judgment and curtail one of the others (Id., pp. 57, 58; D. Vol. 2, p. 858, Ans. 570, pp. 859-60, Ans. 584), leaving in his hands, on April 1, 1878, a balance of $200, of the clock company money, which, however, he was obliged immediately to pay out on other notes and debs overdue (D. Vol. 2, pp. 861 to 865), so that, as Shettel testifies (D. Vol. 1, p. 210, Ans. 45), and Drawbaugh corroborates (D. Vol. 2, p. 863, Ans. 596), in ten days after the clock company paid him the $500, he had not five dollars left. The $250 received from Chellis in January, 1879, was immediately paid out in the same way. His creditors were pressing him for money that he owed, and it was but a short time till he was out of money (Chellis, D. Vol. 1, p. 525, 526, Ans. 1, 6, 7), and in less than a week afterwards he had to borrow from Chellis again in order to get along (Drawbaugh, D. Vol. 2, p. 864). The remaining Wise judgment was unpaid till after the commencement of this suit.

It would seem that nothing could show more clearly than these facts, the extreme poverty and pecuniary helplessness of Mr. Drawbaugh, from the end of the year 1869 till the summer of 1880; but there are in evidence certain corroborating facts, and the testimony of from thirty to forty of his neighbors, that will convince us that the statement above detailed, strong as it is, is utterly inadequate to give us a proper conception of his great destitution during that long period, and his want of financial resources even prior to that period. We will now briefly state this additional evidence.

First, In the above history, we have charged Drawbaugh with receiving from Fettrow, for rent, $80, in 1868, and $110 per year from April 1, 1869, to April 1, 1876. But Fettrow testifies (D. Vol, pp. 353-355, Ans. 63 to 75) that a large portion of this was not paid in cash to Mr. Drawbaugh, but the rent was "generally" paid "through *work* and money paid to him *and other persons*." (Ans. 63.) Fettrow produces his rent-account books, and they, as explained by his (Fettrow) testimony, tell a pitiable story of Drawbaugh's poverty. (See D. Exhibits, pp. 1 to 11, where they are copied in full; and Fettrow's testimony, D. Vol 1, p. 370.) Drawbaugh is charged, on the rent account, with all sorts of articles, such as beef, lard, wood, veal, potatoes, coal, corn, butter, flour, etc. Fettrow, who was a blacksmith, kept none of these things for sale, but testifies that he would, at solicitation of Mr. and Mrs. Drawbaugh, go and buy them for Drawbaugh's family, paying for them himself, and charging them against the rent, because Drawbaugh had not the money to buy them! (Ans. 70, 71.) He also, from time to time, furnished Mrs. Drawbaugh with small items of cash "to keep the family going." (Ans. 74.) Drawbaugh's attention was so engrossed in his inventive labors and experiments that his family was not always provided for. (Ans. 97, 112-114.) Where Fettrow charged Drawbaugh's rent account with work done, money paid, or articles furnished to other persons, it was, of course, in payment of some of Drawbaugh's small debts, which the latter was unable to meet. This state of affairs lasted, as is shown by Fettrow, down to the spring of 1876, when the rent account ceased.

Second, JACOB H. RENCKER (D. Vol. I, pp. 235, 236) testifies to a circumstance in May, 1877, which strikingly illustrates Drawbaugh's extreme poverty at that time. We give it in his own words:

"Q. 30. What called you to his shop frequently during the year 1877, as you have testified?
A. I had some little business with him that year.
Q. 31. What was the nature of that business?
A. *Trying to get some money out of him which I had loaned him.*
Q. 32. When did you loan it to him?
A. In May, 1877.
Q. 33. Under what circumstances?
A. He came to the field where I was working, told me he was very hard up, and wanted me to loan him about twenty dollars, for two weeks, and I gave it to him.
Q. 34. Did he repay that loan all at one time, or a little at a time?
A. Only a little at a time, on different times, but the last in March, 1878.
Q. 35. How small were the partial payments?
A. As small as three dollars, perhaps some less; I don't recollect that.
Q. 36. Please state, if you know, where he got the money to make the final payment, and, if you recollect, what he said to you at that time?
A. *To make the last payment, three or four dollars, he borrowed of the storekeeper at Eberly's Mills; he was very hard up for money, is all that I recollect of him saying.*
Q. 37. At the time you made that loan to him was there any other transaction between you and him?
A. *There was. He wanted to trade me a bureau and secretary combined, on provisions, such as meat, potatoes, butter, eggs and lard, for his family, and we traded in that way.*

Q. 38. Did he, or did he not, at that time say anything about being in want of provisions for his family?

A. *He did say that he needed provisions very bad for his family.*"

This pitiable statement Drawbaugh himself confirms (D. Vol. 2, p. 866) as follows:

"Q. 624. Why did you trade off your bureau and secretary at that time?

A. *I needed provisions for my family.*

Q. 625. Had you no means to get such provisions, except by trading away your household furniture?

A. No, sir, not at that time—I can't—*I had no other means.*"

Third. HERTZLER (D. Vol. 2, pp. 700–702) gives another and still more striking illustration of Drawbaugh's poverty in December, 1878, when his father died.

"Q. 4. Do you remember the time of his father's death, and if so, when was it and what occurred between you and Mr. Drawbaugh?

A. I remember the time, but the date I cannot fix. I remember what occurred, but the year has slipped my memory entirely. He came to my place in the evening, when the next day the funeral of his father was to be, and said that he would like to attend the funeral and wanted to know *if I would give him money enough to pay his way.* I then asked him whether he was going alone. He said his wife should go, *but he was afraid that he could not get the money for them both.* I asked him about the children. He *said that they have not got the clothes.* I think that was the excuse he made about the children, that they had not clothes suitable. I then asked him how much the fare would be to Newville, where his father had lived, and he thought *about ninety cents one way would be the cost of a ticket.* Then I asked him whether he thought five dollars would be enough. He said that it would. I gave him five dollars, and he gave me a due-bill and promised that he would pay it in a very short time. *He never paid it in money. He spoke of it at different times and said that he was ashamed that he could not pay me, but that he would pay it before long.*

Q. 5. *How did he pay that, if he ever did?*

A. *I don't think he ever gave me full value for it; he filed my saws several times and done me favors in that way; he fixed a pruning-shears—put a spring in. I remember that very distinctly.*"

The same witness, who was a near neighbor, testifies (Id., p. 700) as follows:

"Q. 1. Have you any knowledge of his pecuniary condition between the years 1870 and 1880, and if so, state what it was?

A. *He was very poor;* at times he had money, but it did not last very long.

Q. 2. Did you have any transactions with him during that period?

A. Yes, sir; he would very frequently buy as small a quantity as half a peck of apples, and had no money to pay for it; and he would buy lard—about two pounds at a time, and mince meat, generally two pounds at a time, and did not pay for any of it."

Fourth. JACOB E. SHETTEL, one of the Clock Co., testifies "to Drawbaugh's continuous poverty from 1869 or 1870 to 1878" (D. Vol. 1, p. 213, Ans. 67); and to his pecuniary condition in 1878 when Shettel was associated with him as follows (D. Vol. 1., p. 211):

"Q. 47. Do you know whether he was in debt a good deal, or not, at that time?

A. Yes, sir; he told me that he owed considerable.

Q. 48. Do you know what his financial condition was during the year 1878? If so, what was it?

A. Yes, sir, it was pretty poor; he told me that he didn't have any money to get what he really should have for his family.

Q. 49. When did he tell you that?

A. Along during the year 1878.

Q. 50. State any other fact that you remember bearing on the subject of his poverty during that year?

A. We came to Harrisburg at various times during that summer, and *he didn't have the money to pay his toll,* *five cents, across the bridge, and paid it for him different times;* and also, *he didn't have money to buy tobacco for himself, and I bought that for him several times;* and *I several times gave him a dollar, when we were over here, to buy groceries for himself.*"

Fifth. George Leonard, the owner of the grist-mill (C. Vol. 2, pp. 1,200, 1,201, 1,205, Ans. 3, 4, 5, 6, 27, 28, 29), testifies to a fact which shows Drawbaugh's poverty in 1873, 1874, 1875 and thereafter. Kissinger kept a small store at Milltown, prior to the spring of 1874, and owed Leonard a bill. Drawbaugh owed Leonard and also owed Kissinger for goods purchased at the store, neither of which bills was he able to pay. So Kissinger, in April, 1873, gave Leonard a promissory note for $60, which Drawbaugh endorsed and agreed to pay, in order, evidently, to get time on his liability to Kissinger. The note ran along, unpaid, till December 31, 1875, and meanwhile Drawbaugh was becoming indebted to Leonard for other supplies procured from time to time. On December 31, 1875, the whole was consolidated in a new note for $103, which ran till Drawbaugh received the $500 from the Clock Co. before he could find means to curtail it (Leonard, Id.; Drawbaugh, D. Vol. 2, pp. 860–1), and then only to the amount of $50 (p. 861).

Sixth. By reference to pp. 863, 864, D. Vol. 2, we find that on March 13, 1877, Drawbaugh bought two shoats from John Rennard, at public sale, for $15.50. He was not only obliged to give a note for this trifling sum, *but to get eleven months' time for payment, and also to get his brother John to guarantee it.* And, even then, he was unable to meet it at maturity, but paid it some time in the spring, probably from the clock company money.

Seventh. The judgment of Dr. Bowman (D. Exhibits, p. 51; D. Vol. 2, p. 851) shows, as we have already seen, that from the beginning of 1873 till he got the money from Fettrow in April, 1876, he was unable to pay his family physician for necessary medical attendance.

Eighth. The Wilson judgments (D. Exhibits, pp. 54, 52, 53) with their various executions, alias executions, stays of execution, returns unsatisfied, etc., show that from February, 1871, till after the April term of 1873 (and probably till he got the Hauck money in July, 1873), he was unable to meet a small debt of eighty odd dollars, and that the constable found no way of making the money from him.

Ninth. The judgment of Good in 1875 (D. Exhibits, p. 55) till he got the money from Fettrow on April 1, 1876, with its execution and return of "*Nulla bona*," in November, 1875, *shows his want of attachable property to the amount even of $29.94 in that period*, and his inability to meet even that small debt.

Tenth. The concurrent testimony of FREES and YETTER (D. Vol. 1, pp. 132–134 and 134–138) shows that the period of his extreme destitution commenced as early as September 17, 1869.

Eleventh. The concurrent testimony of a great number of witnesses, his neighbors, associates and intimates, shows that from 1869 to the summer of 1880 he was in extreme poverty. GOOD (D. Vol. 1, p. 506) lived at Milltown from the spring of 1867 to the fall of 1870—during that time Drawbaugh's means were very limited.

HIS WIFE (D. Add. Proofs, pp. 221–232, Ans. 20, 22 to 30) testifies that the family lived in extreme poverty from 1869 to 1880, hardly knowing from day to day where their bread was to be obtained, and dependent upon relatives for clothing.

MARQUART (D. Add. Proofs, p. 116, Ans. 26–33) shows that for several years prior to March, 1875, Drawbaugh was always complaining of poverty, and was too poor to take a policy of insurance, although he desired to do so. In March, 1875, Marquart gave up soliciting him, as it appeared a hopeless effort, and never went there afterwards.

ORRIS, ex-county treasurer (D. Add. Proofs, p. 124, Ans. 35), testifies that Drawbaugh, in July, 1873, told him he desired to get this invention patented, but was too poor to do it, unless he could get help.

WOODBURN, candidate for county treasurer, visited Drawbaugh's shop July 14, 1873, on political business (D. Add. Proofs, pp. 133–138), and Drawbaugh made the same statement to him that he did to Orris at about the same time.

EMRICK (D. Add. Proofs, pp. 130–132) accompanied Woodburn on said political trip, and corroborates the statements of the latter. (Ans. 25.)

STEPHENSON (D. Add. Proofs, p. 142, Ans. 2, 3) testifies to his always representing himself as poor.

LONGNECKER (D. Add. Proofs, p. 159, Ans. 4) testifies to a similar conversation with Drawbaugh before the Centennial.

SHANK (D. Vol. 1, pp. 30, 31), the township constable, testifies to Drawbaugh's poverty from 1869 to 1880; tells of the executions, tax bills, etc., that he had in his hands for collection from him, the inability of Drawbaugh to meet them, and the expedients resorted to by the constable to make his collections.

FREESE and **YETTER** (Id. pp. 132 to 138), above cited, testified to his poverty from September, 1869, to the spring of 1870.

ZACHARIAS (Id., p. 50) testifies that from 1870 till into 1874 Drawbaugh was "hard up for money."

CARL (Id., p. 159), a butcher, lived at Milltown from the spring of 1869 to the spring of 1873; had an account with Drawbaugh; "pay was always very slow;" "never got any amount from him at one time;" Drawbaugh "never had it—never had the money to pay it."

SCHERICH, an insurance agent (Id., pp. 180–181), testifies that Drawbaugh couldn't insure his house through a period of many years for the reason that he hadn't the money—"he was too poor, he couldn't afford it." (Ans. 48, 54.)

SHETTEL (above quoted) tertifies to his poverty from 1870 to 1879.

FETTROW (above cited) shows his extreme destitution from and after 1870.

J. B. DRAWBAUGH, his brother (above cited), testifies to his poverty from 1870 to 1880.

H. F. DRAWBAUGH, his brother (above cited), confirms the testimony of J. B. Drawbaugh.

HERTZLER (above cited) strongly confirms the same.

J. D. KAHNEY (Id., p. 204) testifies that during the years from 1872 to 1880 Drawbaugh "was poor." "He was so poor that the neighbors wouldn't trust him hardly for anything." (Ans. 45, 46, 55.)

C. EBERLY (D. Vol. 1, p. 117), an old neighbor who had known Drawbaugh for many years, when asked what Drawbaugh's pecuniary condition was down to the summer of 1880, answered: "I am not able to tell that; I think he has been poor all the time." (Ans. 37.)

SMYSER (Id. p. 78) testifies "that he was a poor man."

Baylor (Id. p. 153) testifies that from June, 1873, till late in 1876 or the spring of 1877 (Ans. 3, 17) Drawbaugh was very poor; common report in the neighborhood where he lived was "that he was very poor, and often did not have the necessaries;" the witness heard at the time, that Drawbaugh's family "*did not know in the evening where their breakfast was to come from the next morning.*" (Ans. 20–24.)

Leonard (D. Vol. 2, pp. 696, 697) testifies that from 1871 to 1876 (Ans. 1, 4, 6) Drawbaugh was always in his debt "for the support of his family," and could not pay because "he had not the money."

Snyder (D. Vol. 1, p. 515) testifies that in 1872, 3 or 4, he, at the time, "did not believe" Drawbaugh "had one dollar," and hence declined a business proposition from him."

Smith (Id. pp. 340, 341) knew Drawbaugh to be very poor from 1872 to 1878; Drawbaugh once during that time, asked witness for a loan of two dollars to pay some creditor, and witness declined to lend it—he was doubtful if he would ever get it back.

Condry (Id. p. 141–2) was a miller employed at Etter & Shanklin's gristmill, in the neighborhood of Milltown from September 9, 1875, till the date of his deposition; from the fall of 1875 till 1880, Drawbaugh's financial condition was poor; "people counted him slow pay. In fact one time I was ordered not to trust him at the mill—and I think that is bad enough—for flour or feed."

Brooks (Id. p. 44, Ans. 34) testifies to Drawbaugh's being "hard up."

Balsley (Id. pp. 194–5.) testifies to his poverty from 1870 to 1874

Bricker (Id. p. 511) testifies to his great poverty in 1870 or 1871.

Bates (Id. p. 420 *et seq.*) corroborates the same statement as applicable to the period extending from the summer of 1874 to the fall of 1877.

Herr (D. Vol. 2, p. 668, Ans. 11) corroborates the same as to the year 1870.

Wolf (Id. p. 675, Ans. 9) corroborates the same as to the year 1875, in February or March.

Fry (D. Vol. 1, p. 146, Ans. 38) states that he had dealings with Drawbaugh from 1875 to 1880, and the latter was always complaining during that period, "that he was scarce of money."

Springer (Id. p. 182, *et seq.*) lived at Milltown from April 1, 1876, to January 6 or 7, 1877, (Ans. 3) and (p. 186.) Drawbaugh was very poor at that time, not being able to pay witness' little bills, the highest of which was about eighty cents, as they became due. (Ans. 44, 45.) Drawbaugh said he was not making enough to meet his ends. (Ans. 50.)

E. Z. **Good**, (D. Vol. 1, p. 199) had to go to Drawbaugh's shop six or seven times in 1876 and 1877, to collect a little bill of five dollars, which the latter "hadn't the money" to pay.

Dellinger (Id. p. 443), a miller, testifies that from March 1, 1876, to March 1, 1881, he lived at Milltown, and during the years 1876 to 1879 inclusive, Drawbaugh was poor; "he always pleaded poverty to me when I asked him for money; I sometimes asked him for fifty cents, and he said he could not give me ten." (Ans. 48.)

Milner (D. S.—reb. p. 514, Ans. 12), and **Clifford**, (Id. p. 510, Ans. 14) confirm the story of Drawbaugh's poverty prior to the spring of 1876.

Kline (D. Vol. 1, p. 627, Ans. 9) corroborates the same fact with reference to the fall of 1877 and prior thereto.

Clendennin (Id., p. 523) testifies to the same fact from 1878 to 1880.

Hamacher (D. Vol. 1, p. 193) testifies to his poverty in 1879. Witness had hard work to collect school tuition from him, and had to get the money through a constable.

Chellis (Id. p. 525, Ans. 7) testifies that from the beginning of 1879 to the summer of 1880 Drawbaugh was "generally very poor and hard pressed for money."

Millard (D. Vol. 1, p. 331) testifies as follows:

> "Q. 73. What was your information about his financial condition from 1869 down to 1880?
>
> "A. As far as I knew, it was about all he could to make a living with his experimenting that he was doing, and scarcely could do that."

Hiler (D. Vol. 1, p. 383), testifies to his poverty in 1869.

Kopler (Id. p. 545), testifies to Drawbaugh's poverty and inability to pay his running expenses in 1873-4.

Geo. W. Drawbaugh (Id. p. 603, Ans. 61), testifies to his uncle's poverty from 1869 to 1880.

Jefferies (D.Vol. 2, p. 684, Ans. 32), testifies that "he "was a poor man and had hard times in getting along," from 1876 to 1880.

Twelfth. The fact of his subscription to the *Scientific American* lapsing in 1869 or 1870, and never afterwards being renewed for want of money (D. Vol. 2, pp. 1052, 1053, Ans. 1569-70), indicates very strikingly his want of means.

Thirteenth. The fact that, although an active inventor, he applied for no patents from the year 1867 till the time when the Clock Co. and Chellis acquired the clocks and new faucet, and furnished the money for patenting them in 1878 and 1879, is something inexplicable on any other theory than the want of means. (For list of all his patents, down to the year 1880, See D. Exhibits, pp. 82-97.)

This concurrent testimony, corroborated by the account books of persons who had dealings with him, by the records of judgments obtained against him, and executions returned unsatisfied, and by the other facts mentioned, is all further corroborated by a great mass of testimony which we shall not here cite, because it will be necessary to refer to it hereinafter, when we come to consider the reason why he did not patent his speaking telephone.

Yet Daniel Drawbaugh was a man of singular industry, an indefatigable worker; a man having no vices; a man who spent no money unnecessarily; a man of the highest honesty and truthfulness. There is no conflicting testimony on these points, but the witnesses, both for complainants and defendants, concur as to the fact.

ZACHARIAS (D. Vol. 1, p. 50, Ans. 37) says that:

> "As a citizen and neighbor he has always been respected."

SMYSER (Id. p. 79, Ans. 41) says:

> "I never heard his word doubted or his character either. He is a poor man."

ZETTER (Id. p. 137, Ans. 16) says:

> "Mr. Drawbaugh's character was a good character. He was industrious and perfectly honest, but poor. He would willingly pay every man he owed if he would have the means. Always perfectly sober; I don't know that I ever seen him drink a glass of whisky; chance times he would take a glass of beer, but not unless somebody bought it for him. Did not, to my recollection, spend a cent at my bar while I lived there."

Condry (Id. p. 142) testifies as follows:

"Q. 36. Do you know what his general reputation was in the community there for honesty, temperance and industry?

"A. Good; I never heard anything about his honesty or dishonesty; never knew him to be intemperate, he was always industrious; people counted him a genius; said he worked hard."

Daniel Balsley (Id., p. 195) testifies as follows:

"Q. 30. Do you know what is his general reputation in the community where he lives for truthfulness and honesty?

"A. I believe he is truthful and honest; that is his reputation in the community where I live and where he lives; I live four miles away from him."

J. C. Smith (Id. p. 342) testifies as follows:

"C. Q. 94. Why was Dan always hard up; did he drink, or was he lazy, or what was the matter?

"A. He spent the most of his time experimenting; that is the reason why, I thought, he was hard up; he was always sober and industrious."

D. H. Good (Id. p. 507) testifies:

"Q. 12. What was Drawbaugh's general reputation, in the community there, for honesty?

"A. Good."

Edward Nichols, one of the complainants' witnesses (C. Vol. 3, p. 860), testifies as follows:

"C. Q. 77. Do you regard Daniel Drawbaugh as a very fine man, conscientious and truthful?

"A. I do."

Isaac Lloyd, another of complainants' witnesses, after testifying that he had known Mr. Drawbaugh intimately for the past sixteen years, stated as follows (C. Vol. 2, p. 1273):

"C. Q. 70. As you consider yourself to have been intimately acquainted with Mr. Drawbaugh for the past sixteen years, please state whether or not you regard him as an upright, conscientious and truthful man?"

"A. As far as I know, I do; he has always acted honorably with me."

As to his industry the witnesses all concur. *Zetter*, *Coudry*, and *J. C. Smith* have already been cited on that point. *Orris* testifies (D. Vol. 1, p. 172) that Drawbaugh worked in his shop habitually till late into the night. *D. Balsley* states (Id. p. 195, Ans. 29): "He was a very industrious, sober, hard-working man from the time he was thirteen years old to the present time." *J. D. Kahney* states (Id. p. 205, Ans. 48) that he had often been at Drawbaugh's shop when the latter was working at night. *Shettel* (Id. p. 211, Ans. 51) testifies as to his working in the shop at different times, "as late as 2 o'clock in the morning." *Rencker* (Id. p. 240, Ans. 81) testifies: "He always appeared very busy when I was there." *Springer* (Id. p. 187, Ans. 53, 54, 55) assisted him at the shop, in 1876, "pretty much every evening," and at other times. *John C. Smith* (Id. p. 335) states that Drawbaugh worked in the shop on Sundays. *Fettrow* (Id. p. 352, Ans. 45, 117) testifies to his frequently working in the shop till 10 o'clock at night, and even later. *Holsinger* (Id. p. 364, Ans. 43, 44) worked with him at the shop many times till 10 or 11 o'clock at night, and sometimes till 1 o'clock in the morning. *Henry F. Drawbaugh* (Id. p. 404-5, Ans. 67) says he assisted him in the shop at various times till midnight.

Dellinger (Id. p. 442) testifies to his habitually working in the shop till nine, ten, eleven and even twelve o'clock at night. *Free* (Id. p. 487) testifies to his working in the shop on Sundays. *Oyster* (Id. p. 490) confirms the same fact. *Chellis* (Id. p. 526) testifies to Mrs.

Drawbaugh's complaints about her husband's working in the shop "most every night" till "twelve or one o'clock."

H. K. Drawbaugh (Id. p. 553, Ans. 29; p. 568, Ans. 137; p. 569, Ans. 145) testifies to his uncle's constant habit of working in the shop, and working till towards midnight, and sometimes till two o'clock in the morning. *Carns*, one of the complainant's witnesses, testifies (C. Vol. 1, p. 916) to Drawbaugh's habit of working at the shop in the evening in 1868 and 1869. *Hart*, another of their witnesses, states (C. Vol. 2, p. 1517, Ans. 36) that it was common report in the community that Drawbaugh was in the habit of working half the night in the shop.

Mrs. Drawbaugh (D. Add. Proofs, p. 224, Ans. 36) testifies that her husband was in the habit of working in his shop every night.

Stevenson (D. Add. Proofs, p. 147, Ans. 47 to 49) gives strong corroboration of his great industry.

We have, then, in Daniel Drawbaugh, by the universal testimony of his neighbors and acquaintances, a sober steady, industrious, honest and truthful man; an "enthusiast in physics," whose "hobby" was electricity; a thoroughly competent mechanic, and a man of great inventive genius. It would be hard to name a combination of qualities better adapted than these to fit him for his great work of inventing the electric speaking telephone; and it would be hard to name a man whose testimony as to what he produced, and what results he accomplished, should be received with greater confidence.

II.

DRAWBAUGH'S TELEPHONE INVENTIONS.

We are now prepared to take up the history of Mr. Drawbaugh's invention of the Electric Speaking Telephone. This history is contained, chiefly in defendant's case, volumes 1 and 2, and in defendant's Add. Proofs (pp. 1 to 311); although a large amount of additional evidence relating to it is to be found in defendant's surrebutting proofs, and strong corroboration even in complainant's evidence.

For purposes of convenience and clearness, we will divide the discussion into two parts, to wit:

First, the history of Drawbaugh's invention from its beginning to the date of Bell's application for his first patent, Feb. 14, 1876.

Secondly, the history of Drawbaugh's invention from Feb, 14, 1876, to the commencement of this suit.

Part I.—Prior to Feb. 14, 1876.

Mr. Drawbaugh conceived the possibility of transmitting speech electrically, over a telegraph wire, during the winter of 1859–60, or prior to that time, and stated such conception to Prof. Samuel B. Heiges, of Shippensburg, Pa., now principal of the State Normal School, while the latter was at that time delivering a course of lectures on Physics in the Cedar Run schoolhouse, near Milltown. Prof Heiges fixes the date by the fact that the lectures were delivered only while he taught school in that schoolhouse, and that he last taught there in the winter of 1859–60. (S. B. Heiges, D. S.–reb., pp. 95, 96, 97.) The date of Prof. S. B. Heiges' teaching in that schoolhouse is also fixed by his brother, George W. Heiges, of York, Pa., a witness for complainant, who succeeded Prof. S. B. Heiges as teacher in the Cedar Run school, and taught there in the winter of 1860–61. (G. W. Heiges, C. Vol. 2, p. 1089, Ans. 2; p. 1094, Ans. 19.) *Prof. S. B. Heiges* (D. S.–reb., p. 96) testifies as follows:

> "Q. 12. Do you remember having any conversations with Mr. Daniel Drawbaugh during those sessions, with regard to the subjects of electricity and magnetism?"
>
> "A. Yes, sir; *on several occasions* he spoke of a clock to be run by a magnetic current of the earth, *and of speaking through the telegraphic wire by electricity.*"
>
> "Q. 13. When he spoke of speaking through the telegraphic wire by electricity at that time, did he refer to it as something that had been done, or as something that he deemed to be possible, or as something he deemed impossible?"
>
> "A. I inferred from his conversation that *he thought it was something that could and would be accomplished.*"

Drawbaugh himself testifies with his characteristic candor, that he cannot remember the date when he began to study the subject, that it was "a great while ago." (Ans. 35 D. Vol. 2, p. 753.) He recollects talking to some medical students at Washington, D. C., about the transmission of sound, as long ago as January, 1861, which date is fixed by a receipt taken there from C. M. Alexander for a patent office fee. (Id., p. 752, Ans. 30–36), and states that at that time he had his mind employed upon the subject. (Ans. 33.) *Henry B. Eberly* (D. Vol. 1, p. 284, Ans. 13), testifies that, *some time between 1861 and 1864, during the war*, Drawbaugh, on one Sunday, in the mill office (Eberly's Gristmill), in presence of several persons including the witness, spoke of attaching an instrument to the office *by which he could hear all that was* *going on at the mill office without leaving his house.* He then lived in the house nearest to the mill, and the distance from the mill office to his house was about forty feet. (Id., Ans. 14.) Drawbaugh (Ans. 38, D. Vol. 2. p. 753), thinks that he had the idea in his mind at that time, or even prior to that. It will be particularly noticed that the witness, Eberly, moved away from Cumberland County to Williamsport, one hundred miles distant, on May 27, 1873, and has never been back to the county since that date. (Eberly, Ans. 3, 4, 8), and that Drawbaugh moved out of that house in April, 1868, and never lived in it again while this witness was in Cumberland county. N. M. Lory, a carriage-maker, testifies (D. Vol. 1, pp. 225-226), that, *in the fall of 1864*, Drawbaugh told him he was "*about making a machine to talk through a distance of about twenty miles*" (Ans. 3); that it was to work *something like a telegraph, but you would have to talk into it* (Ans. 6); he understood that Drawbaugh had invented it, and had the plans made, and was going to make the machine (Ans. 9); that Drawbaugh tried to explain it to him, but witness could not understand it (Ans. 5); that Drawbaugh made a rough sketch of it, which witness reproduces and explains to the best of his recollection, said sketch being filed as "Exhibit Lory," and printed on p. 135, D. Exhibits; and that the part of the sketch marked "D" was the part to be talked into, and *was something like a cup*, while the part marked "A" was hollow inside and the parts marked C C were wires. ***Witness was never in Drawbaugh's shop since the fall of 1864.*** (Ans. 25.) He fixes the date as the fall of 1864, by the fact that his business at the grist-mill that day was to see about fixing Christian Eberly's buggy wheel, which had been broken. It will be noticed that there are *two* wires shown in the sketch, indicating electric circuit wires, and that the distance, "about twenty miles" indicates the use of electricity. The resemblance of the transmitter to a "*cup*" will also be borne in mind. The exact date of this event is fixed by John B. Drawbaugh's testimony (D. Vol. 1, pp. 585–6, Ans. 79 to 85), who swears that he was doing a particular job of repairing on the grist-mill for Mr. Eberly, at the time when Eberly's buggy wheel was broken, and produces his book account showing that that work extended from September 5 to September 27, 1864. He further states that William Lory was living at Milltown at the time. Recurring once more to the surrebutting proofs.

SAMUEL H. BATES (D. S-reb., p. 380), testifies that Martin Tates died at Milltown on Sunday, October 21, 1866, from hydrophobia, and, the case exciting a great deal of interest, he, with others, went to see the sick man on that day. As the witness passed the grist-mill Drawbaugh passed by, going towards Tate's house, and at that moment witness heard one of a group of men who were standing in front of the mill say: "Look at Daniel "Drawbaugh; personally you wouldn't think there is "more in him than a block of wood, and the idea of a "man like he to try to invent a talking machine"; to which another of the group replied: "If he is successful "in getting it finished, he will be the richest man in the "valley." Mrs. Mary M. Baer also testifies (D. S-reb., p. 110), to hearing Drawbaugh's talking machine spoken of in 1866, before her daughter worked in Drawbaugh's family. Returning to the defendants' answering evidence. CHRISTIAN EBERLY (D. Vol. 1, pp. 113, 114, Ans. 3, 9, 10, 11, 12), states that before he moved to New Cumberland (which was in 1867), Drawbaugh told him that sound could be conveyed by electricity, and that he was experimenting on it. **James A. Smith**, the postmaster of New Cumberland, Pa., testified (D. Vol. 1, pp. 518–20) that he lived in Milltown from the 18th, or 19th of March, 1856, till late in the fall of 1867, when he moved away (Ans. 3, 4); and that *early in the spring of 1867* Drawbaugh came into witness' office, and a conversation ensued on the subject of the telegraph, which the witness states as follows: "Mr. Drawbaugh remarked that the telegraph would be yet superseded and *men would talk audibly, as face to face, at any distance* saying at the same time *that he was experimenting.* I asked him at the time if he thought so, when he remarked: '*I am confident of it.*' I don't remember of any other conversation until within three days of that time—it might have been the next day—in his shop, when he told me that he and his daughter—I forget her name, but he says Emmy—*had talked together, and that there was a floor and two partitions between them.* At this time he did not tell me by what means they had conversed, but it made the impression on my mind that it was by a wire, but he did not say that; I don't know what made the impression, but that was the impression on my mind—that it was a wire. The daughter to whom Mr. Drawbaugh referred is now dead; I do not remember her name, but it was his oldest daughter." (Ans. 7.) It will be remembered that Mr. Drawbaugh's daughter died on November 18, 1871. (D. Vol. 2, p. 750, Ans. 23.)

Drawbaugh himself testifies (Ans. 39, p. 753) that his first telephone apparatus employed a *teacup* as the body of the instrument (compare Lory's testimony and Exhibit Lory sketch,) and *thinks* that he had that machine before he took out his faucet patents of November 20, 1866, but *knows* that he made the instrument before he moved his shop to the old clover mill now occupied by him.*

The teacup transmitter disappeared long ago, but its construction and mode of operation are fully and clearly set forth by Mr. Drawbaugh (D. Vol. 2, pp. 756–765), where it is illustrated by a sketch on p. 756, (Exhitit D, Drawbaugh sketch No. 1) and the mode of its construction and use in a battery circuit is shown by another sketch on p. 764 (Exhibit D, Drawbaugh sketch No. 3). It was a "carbon telephone" transmitter, operating on precisely the same principle as the "Blake Transmitters," now in general use and claimed to be covered by the Bell patent. The body, A, was an old porcelain teacup; the diaphragm, B, was a membrane; the electrodes, D E, interposed in the circuit, G H, were of copper, and the upper one, E, was connected to the diaphragm by a wire, C, so as to vary the pressure upon the low conductor, F, through the action of the sound waves. The low conductor was of pulverized material, and a vast number of experiments were made with it to test the merits of different substances and mixtures for that purpose, but he considered carbon the best (see pp. 998–999, cross-examination). The current used with it was generated by a galvanic battery, and was a continuous current. (Ans. 70.) The instrument transmitted sound by electricity—"some words but feebly"—and so that different sounds could be distinguished from each other and vocal sounds from other sounds. (Ans. 72, 73.) The results were such as to encourage him to go on with his experiments. (Ans. 73.) It was a clear anticipation of the Bell patent of March 7, 1876, if the latter be held to cover the electric speaking telephone. (P. Benjamin, defendants' expert, D. Vol. 2, pp. 1206–7, Ans. 50.)

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*It will be remembered that he moved his shop down to the old clover mill in 1867.

The *first* receiver used with this teacup transmitter, he is unable positively to state, but says (Ans. 74):

> "The time since then is so long that I have no vivid recollection of any particular one; *I had a number of crude apparatuses*, but can't exactly remember the shape of any of them, *I had membranes stretched over hoops—over a hoop—I remember that; and I had electro-magnets, and the arrangement was varied*; I don't remember exactly the arrangement."

Whatever the first receiving instrument was, it was in the same circuit with the transmitter (Ans. 75). The first receiver that he is able definitely to remember and describe, is that shown in his sketch on page 762, marked Exhibit D. Drawbaugh sketch No. 2. He thinks this was made before he moved his shop to the clover mill (Ans. 85), and that it was used with the teacup transmitter. (Ans. 85, 93). It consisted of a tin can, B, having its bottom and top removed and a membrane diaphragm C stretched across one end, which membrane was connected by a tense cord, D, to an armature F supported on a spring G and arranged close to the poles of an electro-magnet E in the electric circuit H (p. 762, and Ans. 90, p. 763), as shown in Exhibit D, Drawbaugh Sketch, No. 3, p. 764. This instrument was a true telephone receiver, containing all the essential elements and inventions claimed by complainants to be found in the instruments represented in Fig. 7, of Bell's patent of March 7, 1876. (P. Benjamin, D. Vol. 2, pp. 1207–8, Ans. 51.)

That Drawbaugh had telephone instruments of some kind and probably the very instruments above described, as early as the year 1867, appears conclusively from the evidence.

Mrs. JENNIE M. BROWN (D. S-reb., pp. 163–170), who went to live in his family as a domestic, in the fall of 1867 (Ans. 6), heard of it at least "a couple of years" before she lived there (Ans. 7). She lived in his family till April, 1868 (Ans. 6), and, during that time, from the fall of 1867 to April, 1868, heard it spoken of in his family (Ans. 9, 10) and ridiculed and opposed by his wife (Ans. 12, 18, 21). Drawbaugh at that time spoke of talking through the machine (Ans. 17, 30). The machine was common talk in the community (Ans. 24–27). The witness saw it, and *remembers that an old common stoneware teacup was a part of it* (Ans. 20, 21, 22). The witness was married July 7, 1868 (Ans. 2), and often heard it spoken of before her marriage (Ans. 15). Her dates are corroborated by her mother, Mrs. Darr (Id. p. 110), who heard her speak of the talking machine while she lived in Drawbaugh's family (Ans. 9); and, in substance, by her sister, Mrs. Margaret Brenneman (Id. pp. 103–109), who succeeded her as a domestic in Drawbaugh's family.

SAMUEL SNELL (D. S-reb., pp. 412–418), was at Drawbaugh's place in 1867 (Ans. 3) when his shop was in the house forty or sixty feet from the grist mill (Ans. 4, 5), and saw and listened at the talking machine (Ans. 3–9). Drawbaugh at that time had an experimental telephone line extending from his shop to the office of the grist mill (Ans. 4), and the witness heard "words" through the apparatus "pretty distinctly" (Ans. 8). Witness did not see the transmitter, which was in Drawbaugh's shop, but listened at the receiver in the grist mill office. He remembers that the receiver looked "like a small tin can with something like a bladder or drumhead over one end of it—tied on" (Ans. 9). He had heard of the machine before, and went and asked Mr. Drawbaugh to show it to him (Ans. 16, 17, 18, 19, 20.) Drawbaugh spoke of the apparatus as something not completed, but which he was working upon (Ans. 7). At that time Christian Eberly owned the grist mill (Ans. 15). Mr. Eberly sold the mill to George Leonard in January, 1871 (Leonard, D. Vol. 2, p. 696–7, Ans. 3). The witness has never been in Milltown to stop since the day when he saw that talking machine there in 1867 (Ans. 22, 23, 24).

James Davis, (D. S-reb. pp. 418–421) was at Drawbaugh's shop in the fall of 1867, after harvest (Ans. 12, 16), Drawbaugh's shop was in the clover mill (Ans. 15). The witness then saw the talking machine in the shop (Ans. 22, 23). He had heard of it before he went down to the shop (Ans. 18–22.) Drawbaugh said he was "working on it" (Ans. 22).

George B. Eyster, sheriff of Cumberland county (D. S-reb. pp. 890, 819), was at Drawbaugh's shop when it was "right back of the grist mill at Eberly's Mills," and before it was moved to the old clover-mill, in company with George B. Heck, who died in July, 1873 (see Barber, Id. pp. 372–3; Natcher, Id. p. 150; John B. Heck, Id. p. 892), and looked at some of Drawbaugh's inventions. As they left the shop Heck told him they had not seen all—that he was working at one which he didn't show to everybody, a talking machine (Ans. 4, 5). William Natcher testifies (D. S-reb. p. 150, Ans. 8) that he heard George B. Heck speak of it in 1871 or 1872.

Henry Killmore, (Id. pp. 1124–1128) was at Drawbaugh's shop with Michael S. Drawbaugh in 1867, when it was "right back of the grist mill," (Ans. 5, 6, 7, 8), and then saw the talking machine there (Id). He was there again in June, 1868, but then the shop had been moved to the old clover mill (Ans. 11, 12, 13). When he saw the talking machine in 1867, Drawbaugh told him he was working at it (Ans. 17); that it was to talk from one point to another (Ans. 19), and that he thought it would be a success (Ans. 15). He had no recollection of ever meeting Drawbaugh between June, 1868, and a time subsequent to the commencement of this suit, when he met him at Bridgeport (Ans. 37–42). *Michael S. Drawbaugh died on March 16, 1871* (Ans. 20, 21). The date of Michael S. Drawbaugh's death is confirmed by Jacob H. Kilmore (Id., p. 1040, Ans. 23), George D. Millard (Id., p. 1098, Ans. 6–10), and Adam Drawbaugh (Id., p. 1100, Ans. 5, 6, 7), Jacob H. Kilmore, George D. Millard and Adam Drawbaugh all heard Michael S. Drawbaugh, in his lifetime, speak of Daniel Drawbaugh's talking machine (Id., p. 1039, Ans. 17; p. 1100, Ans. 4; p. 1097, Ans. 1–4).

JACOB A. GRAHAM (Id., pp. 1057–1069) testifies (Ans. 11–13) that, in 1867, Daniel Drawbaugh's brother, Henry F. Drawbaugh, at Newville, thirty miles away from Eberly's Mills, told him of Daniel's talking machine, and said it would take the place of telegraphy. Witness was then an internal revenue inspector at Newville, in Andrew Johnson's administration, and Henry F. Drawbaugh had charge of the bonded warehouse at Wheeler's distillery (Ans. 1 to 21).

GEORGE MURPHY, of Newville (Id., pp. 1063–1066), ran the engine at Ahl & Snyder's distillery, near Newville, from November 22, 1866, till June 1, 1867, and, during that time, in April, 1867, Henry F. Drawbaugh came to the distillery on some business, and while there, told him of Daniel's talking machine, and stated that it would take the place of telegraphing after awhile.

JOHN S. DOUGHERTY, a merchant at Newville, (Id., pp. 1131–1134) heard Henry F. Drawbaugh, in February or March, 1867, speak of Daniel's talking machine, and heard others speak of it about the same time. In May, 1868, witness went to Daniel Drawbaugh's shop at Eberly's Mills, to see the talking machine, but could not get admittance in consequence of Mr. Drawbaugh's absence at the time.

WILLIAM DARR, one of the complainants' rebutting witnesses (C. Vol. 1, pp. 358-366), was forced on cross-examination, into a striking corroboration of the main fact above referred to. He was called by the complainants to prove, among other things, that, although he had lived at Milltown for twenty years prior to March 31, 1870, when he moved away, and had known Drawbaugh well during that time, he had never seen or heard of his talking machine (p. 359). But he had, at one time while he lived there, gotten off a great joke upon Mr. Drawbaugh, and was very vain of its paternity; and upon this rock his testimony-in-chief went to pieces. We will let him give the story in his own words:

"C. Q. 85. I have heard that you once got off a very good joke on Drawbaugh while you lived there. He was telling you that he had a machine with which he could talk across the Atlantic ocean, and you replied that he had better limit his operations to Yellow Breeches Creek before he tried the Atlantic Ocean?

"A. That is so; that is what I told him.

"C. Q. 86. Your words, as I have heard them repeated, were about as follows: 'Dan, you had better try the Yellow Breeches before you try the Atlantic Ocean.' Is that substantially the reply you made to him?

"A. Yes, sir; that is about it. He said the time was coming when they could talk across the sea. I said, 'O! take the Yellow Breeches first.'

"C. Q. 87. How long was that before you moved away from Eberly's Mills?

"A. I don't know whether I can study that up or not. I know it was a couple of years before I moved over here.

"C. Q. 88. Do you mean to say it was just two years before, or might it have been more than two years?

"A. About two years before I moved over here.

"C. Q. 89. Where was that conversation, in what building or place?

"A. In the shop next to Eberly's Mill. One was called the upper shop, and the other the lower shop. It was in the upper shop.

"C. Q. 90. How happened the conversation to start on the subject of talking across the sea?

"A. I hardly mind that—exactly how it happened. I don't think much was said, He was tired and leaning against the bench and said: 'Bill, do you believe the time is coming when we can talk across the sea?' I said: 'Oh, you had better try the Yellow Breeches first.' I said too: 'What is the matter with you, Dan, are you going crazy?' I don't think there was much more than that said, before or after.

"C. Q. 91. Didn't he say, also, that he was going to do it, or had a machine that would do it?

"A. No, sir; he said nothing of the kind.

"C. Q. 92. He dropped the conversation after your reply to him, did he?

"A. Yes, sir."

In the last three answers above quoted, the witness evidently tries to tone down the testimony found in his answers 85, 86. He changes the statement of Drawbaugh from the positive form of answer 86, "*He said the time was coming* when they could talk across the sea," to the interrogative form, "*But do you believe the time is coming* when we can talk across the sea?" and states that Drawbaagh did not say he was going to do it, or was working on a machine for the purpose: whereas, his own alleged reply to Drawbaugh, "*You* had better try the Yellow Breeches first," shows that such was undoubtedly the tenor of the conversation. This conversation, he says, was about two years before witness moved away from Milltown. (Ans. 87, 88.) His wife, however, who was called as a witness for the defendants, in surrebuttal, remembers the joke (which seems to have been an unusual event in the family), and states the fact as follows (D. S-reb. p. 110):

> "Q. 10. Did you ever hear your husband, Mr. William Darr, while you lived at Milltown, say anything about Mr. Drawbaugh's talking to a distance, or mention the subject of talking to a distance?
>
> A. Yes, sir.
>
> Q. 11. Do you remember what your husband said about it at that time?
>
> A. Yes, sir.
>
> Q. 12. Will you state what it was, as you remember it?
>
> A. He came in one day and *said to me that Mr. Drawbaugh was speaking of making a telephone, or some sort of a talking machine; that he could talk across the ocean with to other parts of the world.* I don't remember just how he spoke it.
>
> Q. 13. Did he tell you what he said to Mr. Drawbaugh? If so, what was that, do you remember it?
>
> A. He told him, '*that he had better invent something* to talk across the Yellow Breeches first.'
>
> Q. 14. Was that conversation while your daughter, Jennie, lived with Mr. Drawbaugh, or before, or after?
>
> A. Before.
>
> Q. 15. Can you tell us when that conversation was?
>
> A. *In 1866.*"

The facts and the date are undoubtedly as Mrs. Darr states. Her husband's admission, after his testimony on page 359 (C. Vol. 1), is a striking illustration of the utter worthlessness of "negative evidence."

It therefore clearly appears, from the above, that Drawbaugh conceived the idea of transmitting speech by electricity over a telegraphic wire, prior to the spring of 1860; that during the rebellion he was studying upon the subject and had formed some crude plan of its mechanism as early as September, 1864; that prior to the beginning of 1868, he had been able to transmit and receive some words quite distinctly through it; that, at that early time, he was intending it, when completed, to transmit speech many miles—to take the place of telegraphing—and even hoped it might be used for conversing across the ocean; and that his efforts were known and talked about, not only in the community at Milltown, but in parts of the adjoining county of York, and at Newville, thirty miles away. What that *something* then devised for the purpose of transmitting speech electrically was, we are informed by his own testimony above cited, which testimony on that point is corroborated by Lory, Mrs. Brown, and Snell. It further appears, by an examination of the sketches of the machines (D. Vol. 2, pages 756, 762, 764), and by the testimony of defendants' expert, as well as by the conclusive fact that the machines audibly transmitted and reproduced some words, that the apparatus anticipated the fifth claim of Bell's patent of March 7, 1876, as the complainants now construe that claim.

We may pause here to refer to some of the preliminary investigations and experiments by which Mr. Drawbaugh was led up to a true conception of the essential characteristics of the speaking telephone at that early date, during the seven years that intervened between his conversations with Professor Heiges in 1859–60 and his achievement of the transmission and reproduction of words in 1867.

"A great while ago," while he was yet a young man attending singing-school, he was instructed in some of the fundamental characteristics of sound, including the fact that *pitch* is due to the *rate* of air vibrations per second. (Drawbaugh, Ans. 80, 81, page 761.) He had also experimented with the vocal organs by placing his hand upon the throat and feeling the vibrations of the vocal cords and in that simple manner learned that the vibrations were unbroken and continuous in a spoken word or syllable. (Ans. 79.) The fact that sound has the effect to set up vibrations in solid substances, he had first learned by noticing such effect in the surface of a partition (Ans. 76); and he had experimentally demonstrated that such vibrations were capable of producing considerable mechanical effects (Ans. 78); and that if a door, vibrated by sound, were connected by a light wooden bar to another door, this second door would give off the same sound. (Id.) He had, as early as December, 1863, known of the Scott phonautograph, in which the sound waves, acting upon a stretched membrane, are caused, by means of a lever style attached to the membrane, to trace their own peculiar characteristics upon a paper or card. He, therefore, knew at that early time that a continuous electric current must be used, and not a make-and-break current, and hence, that the electric current must be modified or varied, but not broken, by the sound waves. Hence, in all his telephones, from the first to the last, he used a closed circuit, and arranged the diaphragm-armature close to the poles of the electro-magnet, but not so as to touch them. (Ans. 199, 200, p. 784.) He never made a make-or-break instrument until within the last year prior to his testifying in the case. (Ans. 383, 384, p. 824.) He never made nor owned a string telephone or "lovers' telegraph." (Ans. 380, 381, p. 824.) His discovery and application of a low conducting material, in pulverulent form, to modify the necessarily continuous electric current, were arrived at by a process of pure scientific reasoning. He conceived the idea that when they were in a pulverized condition the air spaces between the particles would offer more or less resistance to the passage of the current, and that if by pressure these particles were brought nearer together, more of their surfaces would be in actual contact with each other, and hence the current would pass more freely through the mass; and therefore, as the result of this reasoning, he connected the pulverized low conductor to the diaphragm so that the movements of the latter, under the influence of the sound waves, would vary the pressure upon the pulverized mass and thus vary the current passing through the line in proportion to the magnitude of the sound waves. (Ans. 148 to 153, pp. 772-3.) This theory was entirely original with himself, and he demonstrated its correctness by experiment (Ans. 152), and by testing it with a galvanometer. (Ans. 65-67, p. 759.) Mr. Drawbaugh's speaking telephone was, therefore, no happy accident. It was the result of a train of seven years' investigation, reasoning and experimentation, carried forward on as logical and scientific a plan as can be found in the whole history of the arts. The accidental vibration of a partition led him to the speaking telephone as logically as the falling of an apple led Newton to the theory of gravitation.

Exhibits F and B.

The next step in the development of Mr. Drawbaugh's speaking telephone, consisted in the production of a transmitter and receiver, constructed upon the same general plan as the old teacup and tin can instruments, but with important improvements. Of these two instruments, nearly all the essential parts remain in existence and are filed in evidence as defendants' Exhibits F and B, the former being the transmitter and the latter the receiver. These extant parts are illustrated in defendants' book of drawings, pp. 2 and 7. For the purposes of this case, the instruments were reproduced and the reproductions filed in evidence as Exhibits Reproduced B and Reproduced F. Drawings of the reproduced instruments appear in said book of drawings, pp. 3 and 8; and the instruments and drawings are fully described in Drawbaugh's testimony, pp. 764 to 774; 868, 869, 872, etc.; Knight, D. Vol. 2, pp. 714-6; Park, Benjamin, Id., pp. 1179-1183, Ans. 29; the latter witness testifying that the instruments completely anticipate the fifth claim of Bell's patent of March 7, 1876, as construed by the complainants.

By examining these instruments, it will be seen that they grew naturally out of the old teacup and tin can instruments illustrated by Drawbaugh's sketches on pp. 756, 762, D. Vol. 2. In the transmitter, F, a glass tumbler superseded the porcelain teacup; the diaphragm was covered over by a wooden cap provided with a mouth-orifice; the low conducting material was placed in a suspended box; an arrangement for adjusting the normal pressure upon the low conductor was provided; and the instrument was lined with plaster-of-paris to deaden the vibrations of its walls. At first, membrane diaphragms were used in this instrument; at other times thin metal, generally tinned iron, known as commercial "tin." (Drawbaugh, Ans. 128, p. 768; Ans. 1270, p. 997; Ans. 1667, p. 1065.) In its companion-instrument the receiver B, Drawbaugh had discovered the superflousness of the string D and spring G shown in the sketch of his earlier form of receiver on page 762, and had discarded them, bringing the diaphragm of the tin-can up closer to the electro-magnet and attaching the armature directly to the diaphragm, thus rendering the instrument quite compact in form and arrangement. The tin tube was lined with plaster of paris (Ans. 108, 109, p. 766); and a metal bracket or spring, G, was employed for giving tension to the membrane. (Ans. 101.) In the old tea-cup instrument he had tested, as a low conductor, "different materials at different times," such as "clean, fine earth," earth combined with plumbago, plumbago alone at times, pulverized charcoal, finely divided metals combined with plumbago, and, perhaps, the same in combination with earth; the experiments being so various that all the combinations could not be recalled to memory (Id., Ans. 61, 62; X 1280 to X 1310); but in tumbler instrument he got beyond the use of earth, and settled upon the use of carbons, or carbons mixed with bronze-powder (Id., Ans. 131; X 1283), although he made numerous experiments to ascertain the best conditions under which the various substances or mixtures could be employed. (Id., p. 1037, etc.) He used a number of different tops or mouth-pieces with the tumbler, F. (Ans. 1289.) At first the box containing the low conductor was suspended by a single rod; afterwards by a U-shaped rod or stirrup, as shown in Exhibit reproduced F. (Ans. 1288, 1289.) In the earliest form of the F instrument he tried the effect of moistening the low conductor by the evaporation of water contained in the lower part of the tumbler. (Ans. 134, 135; X 1294), and found that with earth and its combinations a certain degree of moisture was the best, while the carbons operated best when dry. (Ans. 1294.) The tumbler with the bottom broken off, now filed as an exhibit in this case, was used at an early period, and is mentioned by various witnesses as having been seen by them from time to time in all the years from 1869 to the present date.

These two instruments, Exhibits F and B, came into existence some time in 1867 or early in 1868.

They were seen at Drawbaugh's shop, by *Henry B. Eberly* about the time when he moved with his parents to New Cumberland, which was in the spring of 1867. (Eberly, D. Vol. 1, pp. 284, 286, Ans. 31, 9, 7). He never was at Milltown after May 27, 1873 (Ans. 8, 11). The tumbler instrument was seen by *Mrs. Brown* when she lived in Drawbaugh's family, from the fall of 1867 to April 1868 (Mrs. Brown, D. S-reb. pp. 163-170, Ans. 6, 20-23). *Hoffman* (D. Vol. 1, pp. 481-485) was working for the old Pump & Faucet Co. in the spring or summer of 1868 (Ans. 3), and saw at that time the tumbler instrument, and Drawbaugh making a wooden top and fitting it on (Ans. 5-8). Drawbaugh at the time said it was a talking machine. (Ans. 5.) *Schrader*, now a resident of New Jersey, and agent of the Judson Powder Co. (D. S-reb., pp. 467-471) worked for the old Pump and Faucet Company from November 20, 1868, to April 8, 1869, (Ans. 2, 3, 6) and boarded with Daniel Drawbaugh during that time. His time is fixed by the books of the company, and also by the fact that Maggie Darr (Mrs. Brenneman, D. S-reb, p. 103) was living in the family as a domestic. While he was working there at that time. Mr. Drawbaugh on several occasions took him up to his private room over the machine shop, and showed him a machine which he called a talking machine (Ans. 12) and which, Drawbaugh stated to him, was "for the purpose of talking between distant points, as, for example between Eberly's Mills and Harrisburg, which, I think, he used as an illustration. He also made the remark that it might be used to take the place of the telegraph." (Ans. 13.) Witness identifies Exhibit B as a machine which he saw there at that time, and states that it had an iron or steel armature fastened across the membrane diaphragm, and that the bobbins on the electro-magnet, which are now dilapidated by age, were perfect at that time (Ans. 14, 15, 16, 17). He also remembers seeing some wooden mouth-pieces at the same time lying on Mr. Drawbaugh's table and resembling the mouth-piece of exhibit F. (Ans. 15.) In the family while he boarded there the talking machine was spoken of at the table on several occasions, when Mr. Drawbaugh "spoke about it in the same spirit and in the same way that he talked to me up in the shop—that it would take the place of telegraphing, and that you could talk between distant points." (Ans. 18.) *Snell* (D. S-reb, p. 413), already above cited, saw the tin can with the membrane diaphragm as early as 1867.

Christian Eberly (D. Vol. 1 pp. 113–121), the father of Henry B. Eberly above cited, moved from Milltown to New Cumberland on April 1, 1867 (Ans. 3, 6), and from New Cumberland to Shiremanstown on December 22, 1870 (Ans. 7). About the time that he moved to New Cumberland, or shortly after (Ans. 13), but positively before he moved to Shiremanstown (Ans. 14), he saw the two machines, Exhibits B and F, at Drawbaugh's shop (Ans. 15). Drawbaugh told him at the time that they were to convey sound by electricity, were to convey spoken sounds, and would answer the same as telegraphing (Ans. 16, 17).

A. B. Shank (D. Vol. 1, pp. 21–41), saw the machines, F and B, in 1869 and prior to February 3, 1870 (Ans. 73–80), and talked through them with Mr. Drawbaugh at his shop (pp. 22, 23). The machines were in different rooms, and connected by two wrapped wires. Witness heard and understood, through the instrument, the words that were spoken into the transmitter, and could distinguish the voice through the instrument as the voice of Drawbaugh and not of some other person. (Id. same pages also Ans. 198–201, p. 40; Ans. 153–155, p. 36). The tin box was of a green color; the bottom—diaphragm—was not torn out as now; and the wire on the electro-magnet was not loosened up as now. (Ans. 117–119). The tumbler was lined with something white, and had some water or liquid in it. (Ans. 58–62.) The diaphragm was transparent (Ans. 65). The tumbler was whole at that time (Ans. 64).

JOHN J. ZACHARIAS, a miller, (D. Vol. 1, pp. 46–60), was, from the fall of 1868, to the spring of 1875,* head miller at the New Cumberland Mills, and, having occasion to face and level off some mill-stones, went to Drawbaugh's shop at Milltown to get a tram for that purpose. While there, on that errand, he saw and talked through the machines B and F (pp. 47–49). Joseph B. Stretch, a millwright, was at work at the same mills at that time, and, by means of his time-book, fixes the date of Zacharias' procuring the tram as before June 18 and July 3, 1869 (Stretch, *Id.* pp. 60–62). When Drawbaugh talked through the machines to Zacharias, on that occasion, the machines were on different floors in the shop (Ans. 16, 17), and Drawbaugh was upstairs while witness was on the floor below (*Id.*). Witness heard and understood, through the machine, what Drawbaugh was saying (Ans. 18), and distinctly understood and recognized the tones of Drawbaugh's voice (Ans. 19). The voice sounded as though he was speaking in an undertone (Ans. 65). Witness' ear was close to the receiver (Ans. 66); he heard no other sound excepting the sound heard through the machine (Ans. 69). The machine was a rude machine (Ans. 71), and the two instruments were connected together by something like wrapped wires, which passed from instrument B out through the partition and upstairs to the instrument F (Ans. 22). The end of the tin can next to the electro-magnet was covered by something fastened on by threads like those now appearing at the end of the can (Ans. 24-27). Drawbaugh said, at the time, that he "could run it "out for miles, and parties could talk in at one end, and be "heard at the other end, the same as persons in a room "together" (Ans. 28), and that it would eventually take the place of telegraphs" (Ans. 29).

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* NOTE.—For the correct dates, see D. Add. Proofs, Hake's deposition, pp. 107 to 113.

HENRY YETTER (D. Vol. 1, pp. 135-138), lived at Milltown from April 3, 1869, to March, 1870, not quite a year, keeping a tavern and carrying on butchery. While living there, one day in haymaking or harvest (1869) he was in Drawbaugh's shop and Drawbaugh told him he was making a talking machine; showed him instruments B and F (Ans. 27), and told him it was operated by electricity (Ans. 21).

GEORGE FREESE (D. Vol. 1, p. 132) was at Drawbaugh's shop to collect some money, $2.50, while Yetter kept the tavern at Milltown, and Drawbaugh went and borrowed the money from Yetter and paid it to witness. At that visit, witness saw instrument B (Ans. 6), and Drawbaugh talked through the machine to him, and the witness with his ear close to the machine, heard through it distinctly. (Ans. 9-11.) He had heard of Drawbaugh's talking machine six months previously, but that was the first time he ever saw it (Ans. 12). Henry Yetter's ledger (Yetter, Id. pp. 135-136; Ans. 29) shows the loan of the $2.50 to Drawbaugh on September 17, 1869.

JOHN SCHERICH (D. Vol. 1, pp. 176-182) saw and talked through instruments B and F about 1869, several years before witness moved to Camp Hill, on April 1, 1873 (pp. 176-7). Drawbaugh went into the basement to talk, and witness remained in the third story of the shop to listen. and heard what was said. (Ans. 7.) Drawbaugh said it was a talking machine, and was better and handier than the telegraph, as you could just talk through it in place of writing. (Ans, 7, 9.) Witness could distinguish the voice through the machine as Drawbaugh's voice (Ans. 12).

ISAAC B. MILLARD (D. Vol. 1, p. 324) was married on November 11, 1869 (Ans. 5), and before his marriage saw and talked through the talking machine at Drawbaugh's shop (pp. 325-327), and heard and understood what was said through it (Ans. 22). He identifies the instrument B as the one he listened at (Ans. 14, 19, 23), and which was in the second-story of the shop at the time (Ans. 19, 23). The transmitter was not in the shop, but out on the bank fifty yards away (Ans. 21, 24, 25), and some person, whom he does not remember, was talking into it at the time (Ans. 21, 27).

ABRAHAM FISHER (D. Vol. 2, pp. 688, 689) was at Drawbaugh's shop about 1868 or 1869, within about a year after Mr. Hursh went into the faucet business there (Ans. 2-12), and saw instruments B and F. (Ans. 10.) Drawbaugh said he was going to bring it to perfection, and was making good progress with it (Ans. 7) and that it was a machine to talk through—he said he could talk through it some distance—from one house to another in town, or from one part of a house to another, he could convey sound. (Ans. 8.) This must have been in 1868, as Hursh was one of the original six who started the faucet business, in May, 1867. (Gorgas, D. Vol. 1, p. 657; Ans. 49.)

David B. Carl (D. Vol. 1. pp. 157–165) was at the shop just after the old faucet company had suspended operations and before they sold out to the Haucks, and saw the instruments F. and B. His visit was in the year 1870 (Ans. 5, 6, 22, 24, 64, 67), while he lived at Milltown and before he moved away in the spring of 1873. (Ans. 4, 5, 3.) The instruments were in different rooms on the same floor (Ans. 31, 32, 33, 34), and were connected by a wrapped wire. (Ans. 10.) Drawbaugh said they were talking machines (Ans. 11); that one was to speak into and the other was to listen at (Ans. 12); that a person could hear at one end what was spoken at the other end (Ans. 13), and that you could hear and understand from New Cumberland to Harrisburg, a distance of about three miles (Ans. 14). The tumbler had plaster-of-paris inside of it, and the end of the tin can next to the electro-magnet was closed (Ans. 59). There was a tube or funnel at the other end of the tin can (Id). This tube and funnel is described and illustrated by Daniel Drawbaugh (D. Vol. 2, p. 868, Ans. 638–641).

Jacob S. Shopp (D. Vol. 1, pp. 387–392) was at Drawbaugh's shop immediately after September 14, 1869 (Ans. 5, 6), to have some work done on a harvester knife which witness and Henry Bonholtzer had patented on that date, and then and there saw the instruments B. and F. (Ans. 16.) Bonholtzer was present at the time.

Drawbaugh told them he was working at a machine by which to convey the voice (Ans. 9) and showed them these instruments.

HENRY BONHOLTZER (Id. pp. 384-387) corroborates the visit, the date and the talking machine.

So many witnesses saw these two instruments, F. and B., at Drawbaugh's shop in 1870, 1871, 1872, 1873, 1874 and 1875, down to February 14, 1876, the date of Bell's application for his patent, that it is utterly impracticable, within the limits of a brief, to give an abstract of their several depositions, but a mere reference must suffice.

Referring to D. Vol. 1:

SAMUEL NICHOLS (p. 228) saw and talked through them in 1869, and heard and understood what was said.

H. GEISTWEIT (p. 458) saw and talked through them in July, 1870, or 1871, and heard and understood what was said.

H. K. DRAWBAUGH (p. 550) saw and talked through them early in 1870.

J. B. DRAWBAUGH (p. 580) saw them in 1869, and knows of their being talked through that year (Ans. 37-40).

G. W. DRAWBAUGH (p. 597), saw them in 1870 or 1871, while painting Jacob M. Sadler's wagon. The date of that job is corroborated by John F. Lee (Id. p. 607); Daniel Drawbaugh (Vol. 2, p. 777); and complainants' witnesses, William Sadler (C. Vol. 1, p. 1039), and Henry Neidig (C. Vol. 2, pp. 1521-31.)

JOHN H. STEPHEN (p. 249), saw them at some time between the beginning of 1870 and 1875. The date is fixed by Henry Otstot (D. S.-reb. p. 361) as in either 1870 or 1871. He was at the shop with Stephen and saw them at the same time. Otstot was never in the shop after 1873 (pp. 360, 361 D. S. reb.)

P. C. Zimmerman (pp. 414–5), saw them in February or March, 1871, and never saw them again till about the beginning of this suit. He describes them very clearly and says Drawbaugh at the time told him that they worked by electricity and could be heard a great distance.

L. C. Steinberger (p. 344), saw them and C. and I, while he lived at Milltown between February, 1871 and October, 1871, and never was in Drawbaugh's shop after that latter date. Harmon Drawbaugh showed them to him in the shop, and said at the time that they had talked through them and could talk from the shop up to the grist mill.

Elias Z. Good (p. 198), saw them in 1872, before he moved away from Milltown on April 1, 1872.

Jacob Hawn (p. 267), saw them while he resided at Middletown, prior to May 27, 1872, when he moved from that place.

John C. Smith (pp. 335–6), among other talking machines saw and talked through F. and B. frequently while employed on the Pennsylvania R. R. on Locomotive No. 502, from April 1, 1872, to April 1, 1873. He fixes the time by his time book. He helped Drawbaugh experiment on the machines, and testifies that he heard and understood through them. He describes the instruments, their condition at that time, and the experiments made with them.

Henry F. Drawbaugh (pp. 396–7), among other talking machines, saw and talked through F. and B. in August, 1872, and could hear and understand what was said through them. He recollects and repeats the words "Harrisburg is the capital of the state, situated on the "banks of the Susquehanna river," which he then heard through them. He fixes the date by work he was doing at the shop, of which he has a book account.

MICHAEL P. SMYSER (pp. 75–6), saw and talked through them not later than 1872, and repeats words which were heard through them: "Don't you want to be a Christian "while you're young?" and counting, "one, two, three, "four, five!" He describes the machines, and that they were operated by electricity. The talking was from one story of the shop to another, with the stairway door closed. He fixes the date by the fact that he was, at the time, arranging for some business, in case he should lose his position at the arsenal, and was at Drawbaugh's shop with reference to that prospective business. He afterwards lost his position at the arsenal, on June 30, 1873. (Diven, D., Vol. 1, p. 74.)

JACOB E. SHETTEL (p. 206), saw them and C about 1872. He describes them with great particularity. (Ans. 4.) The instrument F then had a metal diaphragm. (Ans. 6.)

RUFUS K. SHIREMAN (p. 259), saw them about 1872. About four months afterward he saw them again, and talked through them, and could distinctly hear and understand what was said through them, being able also to recognize through them the voice of the speaker.

I. D. KAHNEY (p. 201) saw and talked through them about 1872, from one floor to another of the shop, and heard and understood distinctly what was said through them.

WILLIAM SENSEMAN (p. 640), among other talking machines, saw and talked through F and B while he lived at Milltown from April, 1872, to April, 1873, and could hear and understand some of the words. One instrument was in the basement, and the other was two floors above. One of the instruments talked through may have been C or I.

Jeremiah Kohler (pp. 544–5), saw them in 1873, and at that time talked through the talking machine. He could hear and understand what was said through it. Drawbaugh told him it was operated by electricity. One of the instruments talked through may have been C or A, which he saw there at the same time.

Dr. John W. Moffit, of Harrisburg (p. 495–6), saw and talked through them in 1873, and remembers hearing the words, "Do you hear me talk," through them. One of the instruments talked through may have been C, which he saw here at the same time. Drawbaugh explained the principle of the machines.

Henry N. Shoop (p. 256) saw instrument F in August, 1873, when H. K. Drawbaugh explained to him that it was Daniel Drawbaugh's talking machine, and was operated by electricity.

Ephraim R. Holsinger (p. 361) moved to Milltown before the middle of September, 1873, and moved away November 27, 1876, since which time he has never been in the town. While there he saw and talked through instruments B and F, and heard and understood what was said through them. He saw the instruments A, D and E, while Mr. Drawbaugh was making them, but saw B and F before he saw A, D and E—which fixes the date of his seeing B and F as not later than 1873. He helped Mr. Drawbaugh experiment a great deal with speaking telephones while he lived at Milltown. He was recalled by the complainants in rebuttal and asked if he had any corrections to make in this deposition, to which he replied that he had one only, viz., to correct the date of his moving to Milltown from September 7, 1873, to September 13, 1873.

HENRY BAYLER, of York, Pa. (p. 151), saw and talked through the talking machine at Drawbaugh's shop in June, 1873. He identifies B and a tumbler instrument as instruments which he saw there at the time.

JAMES BROOKS, millwright (p. 41), worked in the grist-mill at Milltown from December 16, 1873, to March 31, 1874, and during that time saw and talked through instruments B and F, one of the instruments being in the basement of the shop and the other two floors above, connected by two wrapped wires. He heard and understood what was said through them. Drawbaugh told him they were operated by electricity.

GEORGE L. HALE (p. 473) saw them and O in the fall of 1873.

DANIEL BALSLEY (p. 192) saw them while the old sawmill was still standing in a dilapidated condition. The mill was torn down and hauled away about September 1, 1874, by Amos Frownfelter. (Frownfelter, Id., p. 661.)

HENRY B. MUSSER (p. 315) saw and talked through them on June 27, 1874, and fixes the date by a book-entry of the job of work which he went to Drawbaugh's shop that day to get done. The machines were in different rooms, and connected by wire. Drawbaugh told him they operated by electricity, and explained to him about low and high conductors.

DANIEL RUPP (p. 427) saw the instrument F and other talking machines in June or July, 1874.

WILLIAM H. BATES (p. 419) saw them and C in the fall of 1874, and Drawbaugh told him they were for talking instead of telegraphing, and that they operated by electricity.

John M. Waggoner (p. 122) saw them and A in November, 1874.

Michael Konn (p. 129) happened to be in Drawbaugh's shop at the same time and confirms the date and the fact of Drawbaugh's showing Waggoner the talking machine and explaining that it operated by electricity.

John Weber (p. 245) saw them and A in the latter part of December, 1874. He was never at Drawbaugh's shop after January, 1875.

Joseph M. Wisler (p. 393) saw instrument B prior to moving away from New Market, in the spring of 1874.

Jacob E. Smith (p. 166) was married March 26, 1871, and while on his wedding trip was at Drawbaugh's shop and saw instrument B.

Daniel C. Jones (p. 504) lived at Milltown one year, from the spring of 1870 to the spring of 1871; has never been in Drawbaugh's shop since; while living at Milltown saw instrument B.

Daniel B. Musser (p. 607) saw instrument B in 1873, before his wife died. She died January 24, 1874.

Urias R. Nichols (p. 90) saw A and B and listened at B, as a receiver, in January, 1875.

Capt. J. A. Moore (p. 613) saw B and others in May, 1875. (Ans. 20–32, pp. 622–623.)

Jonathan Balsley (p. 110) saw F. and others in October or November, 1875. (Ans. 33.) He fixes the date by the death of his wife at that time.

Daniel B. Condry (p. 139) saw B, F, and others on Christmas day, 1875.

Daniel Fettrow (p. 347) saw them and others when the Axle Company were getting their new machinery into the shop, which was in March, 1875.

Jeremiah Fry (p. 144) saw them and others on or about April 9, 1875.

Jacob H. Renecker (p. 233) saw them and others on or about the beginning of May, 1875.

William Eppley (p. 281) was never at Drawbaugh's shop since May or June, 1875, but saw B and F there, or something similar to them, and possibly A, at or prior to that date.

George Free (p. 484) saw them and others on or about June 21, 1875. The date is fixed by

John A. Oyster (p. 490), who was there with Free and saw the same machines. Drawbaugh talked through the talking machine to them that day.

John F. Rupp (p. 311) saw F and A on February 1, 1876. The precise date is fixed by Hamacher (p. 289), Strong (p. 375), and the entry of the visit on Strong's school report, D. Exhibits, pp. 14-15, lower left-hand corner of p. 15.

Referring to Vol. 2, of defendants' evidence:

Henry Herr (p. 669) saw B, or something very like it, and also a "glass part," at Drawbaugh's shop about 1869-1871. Drawbaugh told him it was a talking machine, and, he thinks, talked to him through it.

N. N. Hubler (p. 691) saw B, F, and others, in January, 1874.

Dr. C. E. Updegraff (p. 1081) saw B, F, and others, in April, 1873.

John Wolfe (pp. 775-6) saw B and others in March, 1873.

John Henry Smith (p. 1094), who was there with Dr. Updegraff, in April, 1873, saw B there at that time.

Thomas Updegrove (p. 1090), who was there with Dr. Updegraff in the spring of 1874, saw B and others there at that time.

Referring to defendants' surrebutting evidence:

JESSE EICHOLZ (p. 160) saw F, B, and others, in 1871, and talked through them. Possibly C or I was used in talking. Heard and understood distinctly. Had heard about the talking machine before he ever saw it (Ans. 6).

GEORGE HOSLER (p. 367) lived at Milltown from March 5, 1872, to March 25, 1873, and never has been in Drawbaugh's shop since he moved away. While living there he saw F, C, and possibly B and I.

JACOB R. VANNASDALE (p. 788) was at Drawbaugh's shop on February 2 or 3, 1875, with Jacob F. Ensminger, and while there saw F, B and others. He was never there after that date. The date is fixed by a book entry, and also by the fact that it was immediately after the explosion of Wilson's store (see Ensminger's testimony). Wilson's store exploded on January 19, 1875, and Wilson himself afterwards died, about November 1, 1875 (see Holsinger, C. Vol. 2, p. 1215; also Complainants' Exhibit, pp. 401, 402, and Holsinger, D. Vol. 1, p. 373 (Ans. 114).

JACOB F. ENSMINGER (p. 808) corroborates the date and the facts testified to by Vanasdale, but is unable to identify all the talking machines seen at the time.

ANDREW EVANS (p, 1) was in Drawbaugh's shop about December 1, 1875, among other talking machines saw B.

MARY A. EVANS (p. 61) was there with Andrew Evans about December 1, 1875, and among other talking machines saw B.

WILLIAM H. ZEARING (p. 122) was there while Jacob Karns was working there for the old faucet and pump company, from August 10, 1868, to February 4, 1871, and saw B.

In Add. Proofs, pages 185 to 196 is the testimony of a very important additional witness, EMANUEL K. GREGORY, who was formerly a resident of Milltown, Pennsylvania, but moved away to Taunton, Massachusetts, in December, 1870, *and was never in the State of Pennsylvania from December 5, 1870* (see his testimony, corroborated by that of his son Joseph, just preceding his in the printed record), *till the day before he testified in the Overland case, March 6, 1885.* He testifies positively to assisting Drawbaugh frequently in his telephone experiments in 1870, to talking and hearing through the machines, and to the electrical character of the instruments; and he identifies Exhibits F and B as the instruments which they were then using (pp. 191, 192; Ans. 46-48).

This completes the list of witnesses—seventy-four in all—who identify Exhibits B and F as in existence prior to February 14, 1876; and, of these, more than sixty identify them as in existence prior to Bell's first experiment of June 2, 1875; more than forty identify them as in existence prior to the month of July, 1874, the date of Bell's alleged conception of the *impracticability* of getting audible results by the vibration of an armature in front of an electro-magnet; and twenty testify that they talked through the machines and heard and understood words and sentences through them prior to June 2, 1875. The instruments F and B were unquestionably experimental and crude and incapable of producing the *best* results, *but they talked,* and thereby demonstrated that Drawbaugh had solved the problem of transmitting articulate speech by electricity.

Exhibits C and I.

Next in order after these instruments came two companion magneto-telephone instruments, C and I. (Drawbaugh D. Vol. 2, pp. 775, Ans. 166, and 787, Ans. 233.) Of these two instruments, C was the first, and was made, in its original form, about the latter part of 1869 or early part of 1870. He was experimenting with it when Jacob M. Sadler's wagon was repaired about 1870 or 1871. (Ans. 169-171), and it was then in a condition to transmit sound (Ans. 174), and was, to the best of his recollection, in the form now shown in Exhibit Reproduced C. Drawing (p. 5, Defendants' book of drawings.) (Ans. 186, 781.) At first, it was made for use as a receiver, and contained two membrane-diaphragms, connected together, inside of the case, by a tense cord; with an electro-magnet, but no permanent magnet. Afterwards, he took off the heel-piece of the electro-magnet, and, by placing a permanent magnet against the cores of the electro-magnet, found that the instrument could be used as a transmitter. After that, he concluded to discard the extra diaphragm, and to that end, sawed off the middle portion of the case and removed it, took out the diaphragms, inserted a German silver diaphragm with an armature attached to its centre, and put the pieces of the case together again. It was now a complete magneto-telephone, capable of being used as a transmitter and also as a receiver (Ans. 183-184); and was in all material respects, the same as the instruments patented in Mr. Bell's patent of January 31, 1877. (P. Benjamin, pp. 1183-6, Ans. 30.) It was used for the purposes of a receiver, as a substitute for the old tin can receiver B, with the tumbler instrument as a transmitter, (Drawbaugh, Ans. 180), in a

In Add. Proofs, pages 185 to 196 is the testimony of a very important additional witness, EMANUEL K. GREGORY, who was formerly a resident of Milltown, Pennsylvania, but moved away to Taunton, Massachusetts, in December, 1870, *and was never in the State of Pennsylvania from December 5, 1870* (see his testimony, corroborated by that of his son Joseph, just preceding his in the printed record), *till the day before he testified in the Overland case, March 6, 1885.* He testifies positively to assisting Drawbaugh frequently in his telephone experiments in 1870, to talking and hearing through the machines, and to the electrical character of the instruments; and he identifies Exhibits F and B as the instruments which they were then using (pp. 191, 192; Ans. 46-48).

This completes the list of witnesses—seventy-four in all—who identify Exhibits B and F as in existence prior to February 14, 1876; and, of these, more than sixty identify them as in existence prior to Bell's first experiment of June 2, 1875; more than forty identify them as in existence prior to the month of July, 1874, the date of Bell's alleged conception of the *impracticability* of getting audible results by the vibration of an armature in front of an electro-magnet; and twenty testify that they talked through the machines and heard and understood words and sentences through them prior to June 2, 1875. The instruments F and B were unquestionably experimental and crude and incapable of producing the *best* results, *but they talked,* and thereby demonstrated that Drawbaugh had solved the problem of transmitting articulate speech by electricity.

EXHIBITS C AND I.

Next in order after these instruments came two companion magneto-telephone instruments, C and I. (Drawbaugh D. Vol. 2, pp. 775, Ans. 166, and 787, Ans. 233.) Of these two instruments, C was the first, and was made, in its original form, about the latter part of 1869 or early part of 1870. He was experimenting with it when Jacob M. Sadler's wagon was repaired about 1870 or 1871. (Ans. 169–171), and it was then in a condition to transmit sound (Ans. 174), and was, to the best of his recollection, in the form now shown in Exhibit Reproduced C. Drawing (p. 5, Defendants' book of drawings.) (Ans. 186, 781.) At first, it was made for use as a receiver, and contained two membrane-diaphragms, connected together, inside of the case, by a tense cord; with an electro-magnet, but no permanent magnet. Afterwards, he took off the heel-piece of the electro-magnet, and, by placing a permanent magnet against the cores of the electro-magnet, found that the instrument could be used as a transmitter. After that, he concluded to discard the extra diaphragm, and to that end, sawed off the middle portion of the case and removed it, took out the diaphragms, inserted a German silver diaphragm with an armature attached to its centre, and put the pieces of the case together again. It was now a complete magneto-telephone, capable of being used as a transmitter and also as a receiver (Ans. 183–184); and was in all material respects, the same as the instruments patented in Mr. Bell's patent of January 31, 1877. (P. Benjamin, pp. 1183–6, Ans. 30.) It was used for the purposes of a receiver, as a substitute for the old tin can receiver B, with the tumbler instrument as a transmitter, (Drawbaugh, Ans. 180), in a closed circuit (Ans. 187), and with better results than any former receiver (Ans. 188). Whole sentences were heard through it as thus used (Ans. 189, 190, 191, 192), before the date of repairing Mr. Sadler's wagon (Ans. 192.) But after the permanent magnet was applied to it, it was used more often for transmitting than for receiving purposes. (Ans. 191.) The horse-shoe magnet was not attached permanently, but was generally placed on the machine with its poles against the heel of the electro-magnet, when the machine was in use.

This entire instrument, with the exception of the magnets, is still in existence, and is filed as Exhibit C in this case (Ans. 181). A reproduction of it has been made and also filed as an exhibit. The extant parts of the original instruments are illustrated in defendants' book of drawings, p. 4, and the reproduced instrument is shown on p. 5. The instruments are clearly described in the testimony of Drawbaugh. (D. Vol. 2 pp. 779–81, 783–5; and P. Benjamin, Ans. 50, 51, 52.)

The instrument, I, was made after C, and was designed as a receiver, to be used with C as a transmitter. (Ans. 194,195.) It was first made about 1871, in the form represented in the left-hand figures on p. 13 of defendants' book of drawings—that is to say, without a permanent magnet—and was, when in that shape, used only as a receiver (Ans. 201); but soon afterwards (Ans. 197, 209) it was modified by placing a compound permanent magnet at the heel of the electro-magnet as shown in the right-hand figures on p. 13 of defendants' book of drawings, and in that form was used both as a receiver and also as a transmitter. (Drawbaugh, Ans. 194, 195, 198, 207, 208, 209.) These changes were made before the Haucks purchased the faucet company's business in July, 1873. (Ans. 210.) These two instruments, C and I, when used together gave results that were much more satisfactory, louder and entirely better, than the results achieved with B and F. (Ans. 202, 203.) They were thoroughly tested in a great variety of ways (Ans. 206), and transmitted and reproduced articulate speech (Ans. 202). The cover or mouth-piece of I was at first considerably arched, as shown on p. 13 (drawings), but afterwards a lower cover was made which reduced the air-space above the diaphragm, and gave better results (Ans. 211, 213, 214). The original wooden case of this instrument is in evidence, with both the arched and the flat covers (Ans. 196, 212), and also the original magnets (Ans. 216, 786–7) and diaphragm. At first the wooden cover was lined with plaster-of-paris, but this was discontinued when the flat cover was made, because found to be of no utility (Ans. 218). At first the metal diaphragm of I was made with holes in it (Ans. 219), but the holes proving of no utility, an imperforate metal diaphragm was substituted. At first the thin metal diaphragm of C was not corrugated, but soon after was corrugated to give it greater stability and rigidity (Ans. 221), which was found beneficial (Ans. 222). *The old tea-cup instrument of 1866 was the first battery transmitter invented by Drawbaugh, and the instrument C of about 1870, was his first magneto transmitter* (Ans. 204, 785). With the two magneto instruments, C and I, as he used them prior to the sale of the faucet business to the Haucks, in July, 1873, *Mr. Drawbaugh had a magneto electric telephone line completely equipped and in all respects anticipating both Mr. Bell's patents here in suit.* (P. Benjamin, Ans. 30.)

These instruments are identified, and their successful use for transmitting and reproducing speech prior to February 14, 1876, proved, by many witnesses besides Mr. Drawbaugh—so many, indeed, that it is impracticable here to give more than a brief reference to their testimony.

CHARLES LEVI STERNBERGER (D. Vol. 1, pp. 344–6) resided at Milltown from February 1, 1871, to October, 1871 (Ans. 3), *and has never been in Drawbaugh's shop since he moved away.* (Ans. 4.) While he lived there, he was in said shop (Ans. 5) and saw instruments F, B, C and I. (Ans. 7, 25–26.) He never again saw the instruments C and I until the day when he gave his deposition and C not till he was actually on the witness stand. (Ans. 27, 28.) *Just before he went on the stand, Mr. Jacobs showed him, at his (Jacob's) office, some of Mr. Drawbaugh's old talking machines but not including I, and Mr. Steinberger told him there was no more, and asked to see it, and described it so clearly that Mr. Drawbaugh had no difficulty in understanding which one he meant and immediately going and getting it for him.* (Ans., 29, 30, 31.)

Both instruments were therefore in existence prior to October, 1871. Indeed

JACOB S. SHOPP (Id., pp. 387–92), saw instrument C soon after he patented his reaper-knife in September, 1869, and probably in the fall of 1869 or early in the year 1870. (Ans. 16, 17.)

HENRY OTSTOT (D. S-reb. pp. 360–364) *was never in Drawbaugh's shop but twice* (Ans. 2), the first time being in 1870 or 1871 (Ans. 10, 11) *and the last time being on the day of the public sale of the effects of George B. Heck, deceased.* (Ans. 3–9.) *George B. Heck died on July 9, 1873, and his sale was on September 13, 1873,* *as shown by the papers of his brother and administrator* (John B. Heck, D. S-reb. pp. 892–3). Otstot saw talking machines on his first visit to Drawbaugh's shop, but does not remember seeing any on his last visit. (Ans. 12, 24.) He identifies instrument C as seen by him there on his first visit. (Ans. 25.)

William Senseman (D. Vol. 1, pp. 640-2) lived at Milltown from April 1, 1872 to April 1, 1873 (Ans. 1, 2) and *has never been inside of Drawbaugh's shop since.* (Ans. 4.) While living at Milltown, he was frequently in said shop, and saw and talked through the talking machines there. He identifies instruments C and I as being among the machines which he saw there or like machines which he saw there (Ans. 11, 20), and says he remembers no others, except F, B, C and I, but remembers these very well. (Ans. 15.)

George Hosler (D. S-reb. 367-371) lived at Milltown from March 5, 1872 to March 25, 1873 (Ans. 2), and *has never been in Drawbaugh's shop since.* (Ans. 10.) He identifies instrument C as one which he saw there—"that or something that looked like it"—and says he remembers it well. (Ans. 11.) Drawbaugh's talking machines were common talk in the community while witness lived at Milltown. (Ans. 15).

Professor Samuel B. Heiges (D. S-reb. pp. 95-103) was at Drawbaugh's shop twice in the months of June or July, in his summer vacations, during the different summers between 1871 and 1874 (Ans. 14, 15), but on his first visit did not see Mr. Drawbaugh. (Ans. 17.) *He never saw Mr. Drawbaugh in his shop but once, and that was between the first day of June, 1871, and the first day of August.* (Ans. 18.) At that visit, witness' brother-in-law, Dr. Mosser, *was living at Shiremanstown* and went to Drawbaugh's shop with him. Dr. Mosser moved away from Shiremanstown to Mechanicsburg on April 1, 1874 (Ans. 20; also see test'y of Dr. Bruckart, who bought out Dr. Mosser's property and practice at Shiremanstown, D. S-reb. pp. 1129-1130). Prof. Heiges' visit was therefore prior to the year 1874. It was also prior to the sale to the Haucks on July 1, 1873, and witness heard nothing said about any contemplated sale, although his brothers-in-law, Dr. Mosser and Henry S. Rupp, were both members of the faucet company, and he was at the time on a visit to their home at Shiremanstown. (Ans. 28, 29.) It is therefore certain that Prof. Heiges' visit to Drawbaugh's shop was prior to July 1, 1883, and probably was in the year 1872, or possibly in 1871. At that visit Dr. Mosser had some business to transact with Drawbaugh, and after he was through with that business, a five minutes' conversation took place between witness and Drawbaugh relative to the talking machines. (Ans. 21, 35.) He then and there saw instrument C and took it in his hand and pressed the diaphragm with his finger in order to vibrate it. (Ans. 34, 36.) *The diaphragm was of metal at that time.* Mr. Drawbaugh told him at the time, that the machine operated both by magnetism and electricity (Ans. 39), *and that the voice produced pulsations* (Ans. 38); and also told him that he (Drawbaugh) and others had talked through the machine (Ans. 32), and that it had operated so that the talk could be heard through it. (Ans. 33.) *After the speaking telephone came into public use, and before witness had any knowledge of this suit, he was in the habit of instructing his classes to the effect that he had seen a speaking telephone long prior at Mr. Drawbaugh's shop* (Ans. 46, 47, 48), and mentioned the fact even in public lectures. (Ans. 46.)

JESSE EICHOLZ (D. S.-reb. pp. 152-158; recalled, pp. 160-162) was at Drawbaugh's shop on November 6, 1873, which time is fixed by his books. (Ans., 7-13.) He then saw the tumbler instrument F, and the instrument C, or one similar to it, but having a horse-shoe magnet attached to it. (p. 162; Ans., 17, 18.) He thinks he also saw I, or something like it. (Ans., 17.) He heard and understood distinctly what was said through the machine (p. 153, Ans., 15, 16), although he was in the cellar, and the speaker was two stories above him (p. 156, Ans., 35.) He heard and understood at first with the mill stopped, and then, to test the question, had the water-wheel started, and found he could hear and understand while it was running. (Ans., 44, p. 157.) His wife was with him. (p. 153, Ans. 11.)

MALINDA ANN EICHOLZ (Id., pp. 158-160), who was with her husband, Jesse Eicholz, on November 6, 1873, and *was never at Drawbaugh's shop since* (Ans., 11), corroborates her husband's account of that visit, and of the talking through the talking machines, in every particular. She had also heard about Drawbaugh's talking machine before her husband went down to see it in 1870 or 1871. (p. 159.)

GEORGE B. EYSTER, sheriff of Cumberland county, also corroborates the Eicholz testimony. He was Mr. Eicholz's co-partner, and was told of the visit at the time. (D. S.-reb., pp. 890-1.)

JACOB E. SHETTLE (D. Vol. 1, p. 209, Ans., 34) saw instrument C in 1872, when he first saw B and F. (See Ans., 7, 8, 9, 10.)

WILLIAM H. ZEARING, secretary of the school board of the township (D. S-reb., pp. 122-135) got Drawbaugh to repair some steelyards in the fall of 1873, and went down to the shop to get them on November 25, 1873, which date is fixed by the entry of the payment in his account books—" 1873, November 25. For relettering " steelyards, per D. Drawbaugh, 35." (Ans. 16.) While there that day to get the steelyards, Drawbaugh talked to him through the machines, Drawbaugh being downstairs and witness two floors above. (Ans, 33-36.) Witness heard and understood through the machine what was said, and remembers some of the words that he heard through the machine, including the words, " The steelyards are finished " (Ans. 37), and the month, day and year. (Ans. 69.) The instrument I looks like the one he saw on that occasion. (Ans. 42.) He heard others talk through the machine at the time (Ans. 54), and heard it all as distinctly as he did the words above quoted. (Ans. 57.) It is evident from his testimony that he did not see the transmitter which was used by Mr. Drawbaugh downstairs, and that I was used as the receiver.

E. B. Hoffman (D. Vol. 1, pp. 481-4; recalled, Id. p. 660) saw I in August, 1873, at the time of the great flood. (Ans. 13, 9.) He saw C before that time. (Ans. 13.) He first heard Drawbaugh talk through the talking machine in the fall of 1871, and understood what was said. At that time (fall of 1871) Drawbaugh asked him through the machine, what he, witness, thought of the machine, witness at the time being downstairs and Drawbaugh above. Witness himself spoke through the machines in October, 1874. In his depositions on pp. 483, 660 he describes the machine C as he saw it prior to August, 1873, specifying the large horse-shoe permanent magnet as a part of it (Ans. 14, p. 483), and the electro-magnet. (Ans. 2, p. 660.)

Complainants made a desperate effort, in rebuttal, to break Hoffman's date of August, 1873, but utterly failed. (*See appendix B of this brief, where such effort and its results are fully discussed.*)

HARMAN K. DRAWBAGH (D. Vol. 1, p. 552) saw C a long while ago (Ans. 18), and he thinks (Ans. 19) that it was before he worked at Waynesboro, which would fix the date as prior to the spring of 1872. (Ans. 14.) When he first saw C it had the electro-magnet as now shown in Exhibit C reproduced (Ans. 22, 23), although he does not remember the permanent magnet.

HENRY HERR (D. Vol. 2, pp. 667-73) *was never at Drawbaugh's shop, so far as he can remember, after the axle company began operations* (spring of 1875) (Ans. 3), but, while there prior to that time, saw instrument C and remembers that it then had a permanent horse-shoe magnet on it (Ans. 16, 17), and looked older than the reproduced instrument C now looks. (Ans. 17.)

HENRY F. DRAWBAUGH (D. Vol. 1, pp. 396-413) saw C and I shortly after he had the apple cylinder made in Daniel's shop in August, 1872. (Ans. 76, 77.)

HENRY BAYLER (Id. pp. 150-7) thinks he saw C at his visit to the shop in June, 1873. (Ans. 31.) *Witness has never been into the shop since the summer of* 1873. (Ans. 16.)

JEREMIAH KOHLER (Id. pp. 543-7) saw C at the shop in 1873. (Ans. 3.) He also heard and understood talk through instruments there during that year. (Ans. 10, 8, 1.)

GEORGE L. HALE (Id. pp. 472-7; recalled, p. 665) saw C in the fall of 1873. (Ans. 7.) It had a horse-shoe magnet on it at that time. (Ans. 11.) He describes said magnet and its position. (Ans. 12, 13, 14.) And it had copper wires connected with it. (Ans. 18.) It also had something like spools having copper wires covered with green, heavier, he thinks than the wires of Exhibit reproduced C (Ans. 2, p. 665), which spool was arranged between the diaphragm and the permanent magnet. (Id. Ans. 3, p. 665-6.) The instrument was like Exhibit reproduced C. (Id. Ans. 1.)

DR. J. W. MOFFIT (D. Vol. 1, pp. 494-506) saw C in 1873. (Ans. 5, 12.) He repeats a sentence that he heard through the machine about that time. (Ans. 13.)

J. B. DRAWBAUGH (D. Vol. 1, pp. 575-96) saw C and I and thinks it was before he went to work for the Haucks, on July 19, 1873, but is not entirely positive as to the date. (Ans. 32-36; Ans. 11.) He talked through some of the machines in the latter part of 1872 or beginning of 1873 (Ans. 26, 27), and the listener heard and understood what was said (Ans. 28, 29); and he remembers and repeats sentences that were then transmitted and understood through them. (Ans. 29.)

M. P. SMYSER (Id., p. 77) saw them both, but is unable to fix the date. (Ans. 28.)

A. B. SHANK (Id. pp. 19-41) saw instrument A about the time when the Axle Company came into operation (December 23, 1874 to April 1, 1875; Ans. 53), and saw C before he saw A. (Ans. 82.) He saw I after he saw C. (Ans. 132.) He thinks that the year 1874 was about the last time that he saw the talking machines. (Ans. 135.)

G. W. DRAWBAUGH (Id. pp. 597-605) saw C, or a machine like it, in 1874, and both used it and witnessed its use by others. (Ans. 46, 47.)

WASHINGTON SUTTON (D. Vol. 2, pp. 1103-1108) saw C about August, 1873. (Ans. 16; 1, 2, 3, 4.) He remembers the permanent magnet on it, the brass on top of the electro-magnet, the mouthpiece or case (Ans. 16), the battery (Ans. 17), the wires hanging loose (Ans. 17, 18, 20), and that Drawbaugh told him it was operated by electricity. (Ans. 21.) He has forgotten whether he heard through it or not (Ans. 19), but remembers that Drawbaugh talked through the machine. (Ans. 10.) His nephew,

RANKIN B. SUTTON (Id. pp. 1108–1109), however, testifies that when Washington Sutton returned home from Drawbaugh's shop, in August, 1873 (Ans. 5), he told of the visit and the talking machines, and said he had heard Mr. Drawbaugh speak through them. (Ans. 10, 11.) Washington Sutton's errand to Drawbaugh's shop was to buy a lathe (W. Sutton, Ans. 7), but when he got there he found that the lathe had been sold to Hauck. (Ans. 8.) This fixes the visit as immediately after the sale of the machinery to the Haucks in July, 1873, and confirms the date, August, 1873, as fixed by the recollection of both witnesses.

Washington Sutton was never at Drawbaugh's shop after that visit. (W. Sutton, Ans. 1.)

N. N. HUBLER (Id., pp. 691–2) saw C and I in January, 1874, while teaching school at Milltown. C then had a magnet upon it. (Ans. 4, 5, 6.)

WILLIAM F. LENIG (Id., pp. 698–9) saw C in January or February, 1874, while Hubler was teaching school at Milltown. Hubler was at Mr. Drawbaugh's shop with him. (Ans. 1, 6.) C then had a horse-shoe magnet upon it. (Ans. 6.)

DR. C. E. UPDEGRAFF (Id., pp. 1081–1093) saw C and I at his first visit to the shop in May, 1874, when Updegrove was there with him. (Ans. 1, 2, 24, 25.) It then had a magnet on it. (Ans. 25.)

THOMAS UPDEGROVE (Id., pp. 1098–1101) *was never at Drawbaugh's shop except on the occasion of his visit there with Dr. Updegraff, in May*, 1874. (Ans. 2, 3, 6.) At that time he saw C and I (Ans. 9), and C had on it an electro-magnet (Ans. 10) and a permanent magnet. (Ans. 9, 12.)

JOHN SCHERICH (D. Vol. 1, pp. 176–82) identifies I as looking like the machine which Drawbaugh talked into at the shop in the fall of 1874 (Ans. 13–28), when witness heard and understood what was said through the line, from the basement to the third floor. (p. 178.) He has no recollection of ever being there after that visit. (Ans. 16.)

RUFUS K. SHIREMAN (Id., pp. 259–266) first saw talking machines at Drawbaugh's shop about eight years ago (Ans. 7), and, a few months afterwards saw others, including I, there. (Ans. 69.) He feels pretty positive that he saw I at his first visit. (Ans. 72.) Drawbaugh spoke to him through the machines at his second visit (Ans.16-23), and he heard and understood the words. (Ans. 27–29.)

WILLIAM J. MAGLAUGHLIN (D. S-reb. pp. 750–763) was at Drawbaugh's shop with E. B. Hoffman (see D, Vol. 1, pp. 481–4) in August, 1873, and saw I. (Ans. 26.) Drawbaugh talked to Hoffman and to witness through the machines, from second to the first floor (Ans. 22–25). and *witness answered back through the machines.* (Ans. 23–25.)

This talking back and forth indicates the use of the two magnetic machines, C and I, at that time. Witness remembers the instrument, I, at which he talked, and listened, but cannot identify the instrument at which Drawbaugh talked and listened; but Hoffman (D. Vol. 1, p. 483) identifies both instruments.

David Spangler, Jr. (D. S-reb. pp. 454–462), lived on the Studebaker farm for two years ending March 1, 1875 (Ans. 3, 6, 10), and was then at Drawbaugh's shop once, in the fall of 1874 (Ans. 28, 29), when he saw instrument I. (Ans. 30.)

Daniel Rupp (D. Vol. 1, pp. 427–39) was at the shop in 1874 (Ans. 9, 10, 12, 15), and saw C (Ans. 15) and other talking machines. Drawbaugh talked through the machines from room to room, and he heard and understood through them what was said, and remembers that the names of some of the Pennsylvania cities were heard through the machines (p. 430). Wrapped copper wires were employed to connect the machines. (Ans. 32.) Drawbaugh said the machine was to take the place of the telegraph. (Ans. 34.)

Thomas Draper, a prominent business man of Dover, Delaware (D. Vol. 2, pp. 1,123–35), *was at Drawbaugh's shop once only in his life, and that was in the summer or fall of* 1874 (Ans. 1–11), for the purpose of ordering a hydraulic ram for his tenant, Kissinger, who lived on his Marysville farm. He then saw and talked through instruments C and I (Ans. 26, 27), and distinctly heard and understood what was said through them. *The defendants did not know of his information about the talking machines till after the complainants had interviewed him first and gotten the facts* (pp. 1,130–2). Witness remembers the entire details of the visit to Drawbaugh's shop with great distinctness. *Until he was informed by the attorney of the Bell Telephone Company, a few days before we put him on the witness stand, he had always supposed that the speaking telephones in use over the country were Drawbaugh's machines, and that the name "Bell" was derived from some capitalist who had put money into the company.* (Ans. 36.)

His deposition is conclusive of the whole case, and the complainants, realizing this fact, made a desperate effort to shake the date of his visit, but unsuccessfully. For a thorough analysis of the evidence attacking and supporting his date, see *Appendix A*, at the end of this brief.

WILLIAM H. BATES (D. Vol. 1, pp. 419-26) was at Drawbaugh's shop and saw talking machines there, including C, in the fall of 1874. (Ans. 9, 10.) He recollects that Exhibit C instrument then had something on it which is now gone (Ans. 10), and that that something was at the place where the magnets of Exhibit reproduced C now are (Ans. 55), but does not remember what it was.

JOHN WEBER (Id. 244-48) was at the shop in the latter end of December, 1874, *and has never been there since January*, 1875. (Ans. 4, 21, 22.) When there he saw, among other instruments, Exhibit C (Ans. 13), and was told that it was to talk in (Ans. 14).

JACOB R. VANNASDALE (D. S-reb. pp. 788-798) was at the shop on February 2 and 3, 1875, and saw instrument C among other talking machines (Ans. 28). He remembers that it had a permanent magnet "right up "against the spools." (Ans. 31.) *Witness was never in the shop after February* 3, 1875. (Ans. 18.) His date is fixed by his books, and is corroborated by Ensminger, (Id. p. 808) who was there with him at the time.

JOAN WOLF (D. Vol. 2, pp. 673-78) was at the shop, hauling the new machinery for the Axle Company, in March, 1875, and, among other talking machines, saw C. (Ans. 22.) He took it in his hand and remembers that the permanent magnet was lying on the bench at the time. His date is fixed by his book entries of the hauling. (Ans. 3-6.)

JEREMIAH FRY (D. Vol. 1, pp. 143-50) was at the shop about April 9, 1875 (Ans. 7), and saw C there. (Ans. 28, 29.) He saw I afterwards, but does not fix the time. (Ans. 30.)

JOHN H. SMITH (D. Vol. 2, pp. 1093-98) was at the shop with Dr. Updegraff and Mr. Boyle in May, 1865, *and never has been there since.* (Ans. 3, 12.) He then saw C and I (Ans. 4, 5, 10, 11) and remembers that C had the permanent magnet and the spools (Electro-magnet). (Ans. 9, 10,11.)

JACOB H. RENEKER (D. Vol. 1, pp. 233-44) thinks he saw C at the shop in May, 1875. (Ans. 4, 10.)

ANDREW EVANS (D. S—reb. pp. 1-37) saw C at the shop about December 1, 1875. (Ans. 63.) His date is thoroughly established by a large amount of evidence of different kinds, extending from p. 1 to p. 95, D. S.—reb.—

EPHRAIM R. HOLSINGER (D. Vol. 1, pp. 360-75) first saw F and B, then A, and then D and E. (Ans. 23.) In the summer of 1875 he helped Drawbaugh experiment, using D and E. (Ans. 34.) Before seeing F or B he saw I, but Drawbaugh did not inform him what it was, (Ans. 24, 25.) Inasmuch as he saw D and E as early as the summer of 1875, F and B before he saw D and E. and I before he saw F and B, it must have been earlier than the summer of 1875 when he saw I.

Besides the above witnesses who were examined in the case of the People's Telephone Company, there were a number of additional witnesses to Exhibits C and I afterwards examined in the Overland case, to wit:

JOHN M. WOODBURN, candidate for county treasurer in July. 1873, and his friend, GEORGE EMRICK, who were at Drawbaugh's shop together on political business July

14, 1873, and whose testimony is found in Add. Proofs, pp. 130-138. They both saw and talked about the telephone, and saw it operated, and they concur (Emrick, Ans. 26, Woodburn, Ans. 36) in recognizing the similarity of Exhibit I to the instrument which they saw in the basement of the shop at that time.

DAVID STEVENSON, JR., (Add. Proofs, 141-155) and his two daughters, ALICE M. STEVENSON (Id., pp. 164-169) and FLORENCE A. STEVENSON (Id., pp. 169-171), who were all together at Drawbaugh's shop one afternoon in some *chestnut season* prior to the year 1875. The date is fixed by the fact that they were at the time living in the house at the corner of 3d and Chestnut streets, Harrisburg, which house they ceased to occupy on September 1, 1875. While at Drawbaugh's shop on that occasion they talked to each other and to Mr. Drawbaugh through his telephones. They testify that they talked *back and forth, asking questions and getting answers*, through the telephones. Therefore the carbon instruments, F and B, could not alone have been used, for they can talk *only one way*, and if those instruments were used there must have been also another set of instruments in use with which to answer back. As this visit was probably in the fall of 1874 (certainly not *later* than that), at which date C and I had been in existence about three years, these latter instruments were undoubtedly the ones which they used. These two instruments, it will be remembered, are *magneto* telephones, talking equally well both ways.

MRS. DRAWBAUGH (Add. Proofs, pp. 221-233) fully corroborates her husband's testimony as to his talking to her at their home through the telephone in the fall of 1872, just after the birth of her son Charles, and before she had risen from child-bed. Mr. Drawbaugh had testified in the People's Telephone Company suit, that the instrument used on this occasion was C. (D. Vol. 2, p. 823-4, Ans. 376-7.)

WILSON H. STRICKLER (Add. Proofs, pp. 233-242), one of the most important and conclusive witnesses in the whole case, testified that, in the summer of 1874, and before the 22d day of August, 1874, he saw Exhibit C at Drawbaugh's shop. On that occasion Drawbaugh talked to him through the telephone, and described to him the principle of the machine, and how he generated the electric current used on it. The witness never saw Drawbaugh on any other occasion, and never was in Milltown in his life, except on that one day. His identification of Exhibit C is complete.

It will be seen from the above that Instruments C and I are identified by forty-nine witnesses, besides Daniel Drawbaugh, as having been seen by them at Drawbaugh's shop prior to February 14, 1876, and by forty-eight as having been seen prior to June, 1875; and, of these witnesses, *sixteen*, viz.: Sternberger, Otstot, Senseman, Hosler, Prof. Heiges, Mrs. Eicholz, Herr, Bayler, Sutton, Updegrove, Draper, Weber, Vannasdale, Strickler, Woodburn, and J. H. Smith, *were never in Drawbaugh's shop after the date of Bell's earliest experiment of June 2, 1875.*

We also call the attention of the court to the fact that in the testimony of Zearing, Woodburn and Emrick, *the very day of the use of these instruments successfully is proved* by reference to records made at the time, and relating to the business which caused the witnesses to be there. Such facts leave no room for debating the question of priority.

Exhibit A.

In the order of Drawbaugh's development of the speaking telephone, Instrument A was produced next after C and I. It was made after C and I. (Drawbaugh, D. Vol. 2, p. 788, Ans. 225), but before D and E (Id. Ans. 246, p. 791.) *It was not made before the sale to the Haucks in July*, 1873, *but was made prior to the axle company.** (Id. Ans. 401, 405.) At first, the mouthpiece was in the centre, and there was no adjusting screw at the centre. (Id. Ans. 226.) The diaphragm, as thus arranged, was found to vibrate too easily, and, to remedy that defect, he placed a piece of soft rubber (a "dampening pad") on its centre, and arranged a brass screw to run through the centre of the lid and bear on that rubber (Ans. 228), which remedied the defect to some extent. (Ans. 229.) This change was made somewhere from two to twelve months after the instrument was originally constructed. (Ans. 227.) At the same time when this change was made, the mouthpiece was changed to one side of the centre, to get room for the screw. (Ans. 238.) Some experiments were made to test the effect of different thicknesses of diaphragm; but no other changes than these now stated were ever made in the instrument. (Ans. 236, 237.) The magnets on it were never changed. (Ans. 1,699.) No change was ever made in Instrument A after the formation of the axle company. (Ans. 1,701.) It was never out of condition for use at any time, except when Mr. Knight was making some drawings of it, and separated some of the wires. (Ans. 327.)

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* The axle company was formed Dec. 23, 1874. (J. A. Moore, D. Vol. I., p. 614.)

No parts of it ever had to be searched for. (Ans. 1,731.) The original Instrument A, thus made and completed prior to the axle company is in evidence as Exhibit A. (p. 788.)

This instrument A is a telephone receiver (Ans. 234), that is to say, it has a diaphragm with armature attached, and an electro-magnet to set the diaphragm in vibration by means of a current coming in through the line, but it has no permanent magnet arranged so as to normally polarize the electro-magnet. It is represented in defendant's book of drawings, p. 1, and is clearly described in Drawbaugh's testimony (Ans. 239), and in Park Benjamin's testimony (Ans. 31, 33), and is in court to speak for itself, and Mr. Benjamin testifies that it is a good practical working receiver, and fully anticipates Mr. Bell's patent of March 7, 1876. The complainant's counsel, in their brief in the Overland case below, describe it as follows: "A is a "*highly organized magneto-receiver*, with a neutral mag-"net. The case is of black walnut, nicely turned, and "furnished with screw cups to attach the line wires to." (p. 77.) It was used on different lines in the shop, with different transmitters (Ans. 232), including the battery transmitter F and the magneto transmitter C. (Ans. 230.) It was a pretty good receiver, but not quite so loud as the magneto-telephone I (Ans. 231), and answered better with a battery transmitter than with a magneto-transmitter. (Ans. 1365–1367.) Words, sentences, and all sorts of sounds were heard through it. (Ans. 231, 233, 234.) It was satisfactory to him. (Ans. 234.) He talked to a great many different people through it. (Ans. 235.) It was kept in different parts of the shop—sometimes in a drawer in his desk. (Ans. 1368, 1369.)

This statement is corroborated, in all particulars, by a "great cloud of witnesses," whose testimony shows that the application of the dampening pad and adjusting screw, at the centre, and the removal of the mouthpiece to one side of the centre to accommodate the screw, took place before January, 1875, and probably in the fall of 1874.

WILLIAM H. BATES (D. Vol. 1, pp. 419-426) was at the shop in August, 1875, and then saw instruments A, D and E there. (Ans. 17.) Drawbaugh, when he showed them to witness at that time, said that "he "thought he had the talking machine completed." (Cross-ans. 31-33.) This was about August 13-15, 1875. (Ans. 65.) He had a good deal of talk with Drawbaugh about them, and about patenting them. (pp. 422-25.)

SAMUEL C. CRAWFORD (Id. pp. 62-6) was at the shop in the fall of 1874 (Ans. 2, 3), before cold weather (Ans. 7-11), and between June 10, 1874, when witness' leg was amputated, and the date when the Axle Company was formed and commenced business in the shop. (Ans. 14, 15). *After this visit*, witness was in Mr. Bear's employment for some time. (Ans. 16). When there, on that occasion in the fall of 1874, witness saw this instrument, A, lying in the shop, and asked Drawbaugh if it was a telegraph-sounder, and Drawbaugh replied, "No, sir; it "is a talking machine." Capt. Moore, one of the axle company, testifies (Id. p. 616, Ans. 12, 13, 14) that Crawford was in the employ of Bear and Kline before December 23, 1874, "I would suppose about two months before "December 23."

DANIEL B. CONDRY (Id., pp. 138-43) saw A on Christmas, 1875, or shortly after. (Ans., 8.)

HENRY M. DARR (Id., pp. 272-5) saw and heard talk through A in the spring of 1875, before haymaking, and understood through the instrument what was said. (Ans., 7–24.) Witness was on the first floor, and Drawbaugh was in the cellar basement. (Ans., 17, 18.) Wires were connected to A. (Ans., 21.) Witness did not go down into the cellar to see the transmitting instrument. (Ans., 23.) Drawbaugh said "it could be made that "you could talk to New York." (Ans., 22.)

HARMAN K. DRAWBAUGH (Id., pp. 550–71) saw A in the beginning of 1875, and it was then in its present condition. (Ans., 30, 32.) He had seen it before that, without the adjusting screw, and with the mouthpiece at the centre. (Ans., 31.)

CHRISTIAN EBERLY (Id., p. 115) thinks he saw it prior to December 22, 1870. (Ans., 18, 19); but he evidently confounds it with some other instrument, possibly C or I, as Mr. Drawbaugh thinks, and the evidence tends to show that it was not in existence at that time.

JACOB F. ENSMINGER (D. S–reb. pp. 808–815) saw A on February 2 and 3, 1875. (Ans. 24, 28, 29.) He remembers the electro-magnet partially covered by the brass plate, and thinks the instrument was in the same condition as now.

WILLIAM EPPLEY (D. Vol. 1, pp. 280–3) saw something which he identifies as similar to instrument A lying on Drawbaugh's desk at same time when he (witness) was at the shop. (Ans. 18, 6, 7.) Witness was never at Drawbaugh's shop after May or June, 1875. (Ans. 4, 5.)

MARY A. EVANS (D. S.–reb. pp. 61–74) saw A at the shop about the 1st of December, 1875. (Ans. 31, 23.)

SARAH E. EVANS (Id. pp. 55–60) was at the shop with Mary A. Evans about the 1st of December, 1875, and saw A there at the time. (Ans. 28, 9, 10, 26.) *Was never there afterward.* (Ans. 31, 32.)

ABRAHAM FISHER (D. Vol. 2, pp. 688–91; recalled, pp. 1121–23) was at Drawbaugh's shop to get a hydraulic ram in June, 1873, and thinks that he saw A there at the time, but would not testify positively to the fact.

GEORGE FREE (D. Vol. 1, pp. 484–90), was at Drawbaugh's shop on or about June 21, 1875 (see John A. Oyster, pp. 491–94, Ans. 5), and listened at A (Ans. 18), in the cellar, where witness was (Ans. 21), while Drawbaugh, on the second story of the machine-shop (Ans. 8), talked and sang through the transmitter (Ans. 7–14); he understood part of the words and could distinguish Drawbaugh's voice. (Ans. 12, 15, 16.) The instruments were connected by two wires. (Ans. 25.) Drawbaugh showed him the batteries used on the machines. (Ans. 22–24.) Machine A is in the same condition as it was then. (Cross-Ans. 42.) Mr. Drawbaugh told him at the time that the talking machine could be used to talk from Philadelphia to California. John A. Oyster was with witness at the time.

JEREMIAH FRY (Id. pp. 143–50) was at the shop about April 9, 1875, and among other talking machines saw instruments A, D and E. (Ans. 12, 13.) Drawbaugh sang through the machines to witness. Witness could hear. (Ans. 14, 15.) Drawbaugh told witness at the time that it was a talking machine, and that he could talk with it as far as the wire goes. (Ans. 16, 18.)

ELIAS GRAYBILL (D. S—reb. pp. 184–206.) Prior to September, 1875 (Ans. 13), and witness thinks in the forepart of the summer of 1875 (Ans. 14), had a conversation with Mr. Drawbaugh about the talking machine, opposite the station house at White Hill (Ans. 15), during which Drawbaugh showed him a talking machine which he had in his hand or pocket (Ans. 20–26), and which he (witness) recognizes as Exhibit A. (Ans. 29.)

MICHAEL M. GROVE, a member of the axle company (D. Vol. 1, pp. 662–5) had a talk with Mr. Drawbaugh about his talking machine shortly after the Axle Company began, and he thinks it was the first time that he went to the shop after signing the articles of agreement on December 23, 1874. (Ans. 1–4.) Mr. Drawbaugh at that time showed him a talking machine, and stated to him that if he would talk into it you could hear him at Pittsburg. (Ans. 1.) Witness recognizes Instruments A and D, as looking like the machines that Drawbaugh showed to him at the time he made the remark above referred to. (Ans. 6.)

DANIEL A. HAMACHER (Id., pp. 289–310) was at Drawbaugh's shop with some of his scholars on February 1, 1876 (Ans. 4, 5, 6), and then and there saw Instrument A and a number of other talking machines which he is unable to identify. (Ans. 13, 14.) Drawbaugh told him at the time that they were to convey words by electricity; that the time would come when you could speak to San Francisco; and that the talking machine would take the place of the telegraph. (Ans. 16–18.) He also showed him telegraph instruments at the same time, and just before he showed him the talking machine. (Ans. 19, 22.) *Witness was never at the shop afterwards until the beginning of the year* 1879 (Ans. 24), at which time he saw talking machines, but they were different from those which he saw February 1, 1876. (Ans. 25, 26.)

EPHRAIM R. HOLSINGER (Id. pp. 360–63) saw Mr. Drawbaugh making Instrument A (Ans. 23) before he saw Instruments D and E (Ans. 33), and saw Instruments D and E as early as the middle of the summer of 1875. (Ans. 34.) Talked through the talking machines a great deal while he lived at Eberly's Mills, from September 13, 1873, to November 23, 1876, *but never was at Eberly's Mills since the latter date.* (Ans. 9.)

N. N. HUBLER (D. Vol. 2, pp. 691–2) was at Drawbaugh's shop about January, 1874 (Ans. 4, 5), and saw some of his talking machines there (Ans. 5), among which he thinks A was one, but is not positive. (Ans. 5.)

WILLIAM F. LENIG (Id. pp. 698–700) was there with Hubler in January or February, 1874 (Ans. 1, 10), and saw talking machines, among which, he thinks, was A. (Ans. 7, 8, 9.)

AUGUSTUS KAHNEY (D. S—reb. pp. 254–266) helped put the Axle Company's machinery into the shop in March, 1875 (Ans. 38), and then saw two talking machines there (Ans. 40), which he identifies as A and E. (*Ans. 47, and Examiner's certificate following Answer 47.*)

IRA D. KAHNEY (D. Vol. 1, pp. 201–5) saw A in the shop in the years 1873 or 1874 (Ans. 25, 26), and heard talk through it down stairs while Drawbaugh was transmitting up stairs. (Ans. 27–30.) Witness used A as a receiver (Ans. 31), and understood through it what was said. (Ans. 32.)

JEREMIAH KOHLER (Id. pp. 543–7) was at the shop in 1873 (Ans. 3), and saw, among other talking machines, Instrument A. (Ans. 4.) Drawbaugh was then making it. (Ans. 5.) Witness remembers the brass plate and electro-magnet on the back of the instrument (Ans. 7), but does not remember the position of the mouthpiece at that time. (Ans. 6.) While he lived at Milltown from April, 1873, to April, 1874 (Ans. 1), Drawbaugh talked through the talking machine to him (Ans. 8) from the lower floor to the second floor (Ans. 9), and he heard and understood through the machines what was said. (Ans. 10.)

MICHAEL KONN (Id. pp. 129-32), was at the shop in November, 1874, when J. M. Waggoner was there (Ans. 3-16), and saw Drawbaugh explaining Exhibit A to Waggoner (Ans. 17), and distinctly remembers the instrument (Ans. 18). Drawbaugh told Waggoner that it was "for electricity." (Ans. 20.) Witness never saw Waggoner after that. (Ans. 39.)

ROBERT McCLEAF (D. S—reb. pp. 815-820) was at the shop-basement with his father, making cider (Ans. 12, 13, 14), while his father lived near Milltown (Ans. 8), before Wilson's store blew up. (Ans. 11.) His father moved away in the spring of 1875 (Ans. 41), and the store blew up on January 19, 1875. (C. Exhibits, p. 401.) Witness does not remember ever being in the shop except that once (Ans. 9), and never was there since the store blew up. (Ans. 11.) On the occasion when he was there, Drawbaugh talked to witness' father through the talking machine, and his father said he "heard it very plainly." (Ans. 17-21.) He identifies instrument A as one that he saw there that day. (Ans. 23.)

ISAAC B. MILLARD (D. Vol. I, pp. 324-34), saw A, D and E at the shop in the year 1875, the year that he moved on to the farm. (Ans. 12, 29, 30, 31, 42.) His last visit to Drawbaugh's shop prior to 1880 was in cold weather (Ans. 48), some time before the opening of the Centennial. (Ans. 46.) He saw A before he saw D and E, and saw the latter not later than cold weather, before the Centennial. (Ans. 49.) Drawbaugh talked to him through A, the witness using it as a receiver in the second story, while Drawbaugh used a transmitter in the lower part of the building (Ans. 32, 33), and witness heard and understood what was said. (Ans. 34.) Two wires were at the time attached to the binding-posts of A.

(Ans. 31.) Drawbaugh told him how to listen (Ans. 82), and he placed his ear at the hole in A. (Ans. 31.) He saw the transmitter at the time, but cannot now identify it. (Ans. 81, 82.)

Dr. John W. Moffitt (Id. pp. 494–500) first knew of Drawbaugh's having talking machines in the year 1873 (Ans. 5), and either at that time or within a month afterwards (Ans. 13, 14), saw A and listened at it while Drawbaugh, in some other part of the building, talked to him. (Ans. 13.) He heard the words, and remembers the sentence, "Do you hear me talk?" Drawbaugh then explained the principle on which the machine operated, and alluded to the vibration of a bee's wing in illustration of the vibrations of the diaphragm. (Id.)

Urias R. Nichols (Id. pp. 89–97) was at the shop about January 18, 1875 (Ans. 4–18), and then saw A and B. (Ans. 18.) Drawbaugh attached the wires to the binding-posts on A in his presence (Ans. 25, 26), and then a boy talked to him, witness listening at A, and the boy being about 200 feet away (Ans. 28, 29, 31, 34), and he heard the boy say through the machine, "Is it you, father, speaking?"

John A. Oyster (Id. pp. 490–4) was at the shop with Geo. Free (see Free's testimony, Id., p. 484) on or about June 21, 1875 (Ans. 3–5), and witnessed Drawbaugh's talking to Free (Ans. 15, 16), and identifies A as one of the talking machines which he then saw there. (Ans. 17.)

Jacob M. Peterman (D. S-reb., pp. 471–476) was at Drawbaugh's shop in September, 1874 (Ans. 16, 30, 31, 34), and saw A. (Ans. 28, 29.) He has never been there since. (Ans. 23.)

Jacob H. Reneker (D. Vol. 1, pp. 233–44) was a the shop in May, 1875 (Ans. 4, 5, 7), and, through A as a receiver, heard and distinctly understood words and music. (Ans. 15–21.) The speaking was done on the second floor, and the listening on the first floor (Ans. 13), and it was impossible to hear what was said except through the machines. (Ans. 22.)

DANIEL RUPP (Id. pp. 427–39) saw talking machines at the shop in June or July, 1874 (Ans. 5, 6), and afterwards saw other talking machines there. (Ans. 11.) Identifies A as an instrument which Drawbaugh gave him to put to his ear at his first visit in June or July. (Ans. 21, 8, 15.)

JOHN F. RUPP (Id. pp. 311–14) was at the shop on February 1, 1876, with his teacher, D. A. Hamacher, and other scholars (see Hamacher, Id. p. 289; Strong, Id. p. 375; Deft's Exhibits, pp. 14, 15), and saw A. (Ans. 9, 10, 11, 12.) *Has never been in the shop since.* (Ans. 32.) *In February, 1876, the time of the visit, witness was a few weeks over twenty-one years old, and never attended school afterwards.* (Ans. 3–8.)

JOHN SCHERICH (Id. pp. 176–82) lived at Camp Hill from April 1, 1873, to April 1, 1875. (Ans. 3.) While living there saw A at Drawbaugh's shop (Ans. 13), when down there to make cider. (Ans. 14.) *Was never there afterwards.* (Ans. 16.) Drawbaugh talked through the instruments at the time (Ans. 17), and witness listened at A (Ans. 18, 19), and heard what was said (Ans. 20), although witness was on third floor (Ans. 22), and Drawbaugh was down in the basement. (Ans. 23.) Saw the instrument that Drawbaugh talked into, and it was not F (Ans. 24, 25, 26), but looked like I. (Ans. 28.) This was in the fall of 1874. (Ans. 27.) Drawbaugh sold that cider-mill to Elias Hake in the summer or fall of

1875. (See Drawbaugh p. 888; Ans. 759, D, vol. 2); and it was in use at Hake's mill in 1876. (See S. N. Emminger, C, Vol. 1, Ans. 20.) Complainants' witness, John Kahney (C, Vol. 3, p. 2054. Ans. 180; p. 2041, Ans. 62), fixes the fact of the cider mill being in the basement of Drawbaugh's shop in the fall of 1874.

JACOB E. SHETTLE (Id. pp. 206-25) saw D and E in 1875 (Ans. 25), and saw A before he saw D and E (Ans. 27), but how long before, can't say. (Id.) Drawbaugh at the time showed him how to adjust A to receive words —screwed it up, and with his breath, or the power of his voice, made it buzz like a bee. (Ans. 29.) A, D, and E were about in the same condition when witness first saw them as now. (Cross-Ans. 139.)

A. B. SHANK (Id. pp. 19-41) saw A "just about when "the Axle Company came into operation." (Ans. 53.) "It was just about that time or, rather, a little before." (Ans. 97.) Witness had it to his ear, and used it for listening at. (Ans. 98, 99.)

JACOB S. SHOPP (Id. pp. 387-92) was never at Drawbaugh's shop since 1874 or 1875 (Ans. 18-20), and then saw A, D and E. (Ans. 22-29.)

JOHN SIMMONS (D. S-reb., pp. 427—441) was at Drawbaugh's shop with Jacob Evans in November, 1875 (Ans. 1-10), and identifies Exhibits A and E as instruments through which Mr. Drawbaugh talked to Evans and witness at the time (Ans. 11-17); witness had heard of Drawbaugh's talking machines at least a year before that visit. (Ans. 18, 19.) Witness went to live at Milltown in 1876 (Cross-Ans. 24), and the visit with Evans to Drawbaugh's shop was in 1875, before witness moved to Milltown. (Ans. 101.)

D. W. SMITH (D. Vol. 1, pp. 66-73) was never at

Drawbaugh's shop after the beginning of 1875, when witness moved to Harrisburg (Cross-Ans. 22–24, and 44); moved to Milltown in the fall of 1874, right after corn-husking, and lived there two months, then moved to Harrisburg (Ans. 3, 4, 5, 6). While living at Milltown was in Drawbaugh's shop and saw him working upon mouthpiece and screws of Instrument A (Ans. 8–10), and this was soon after witness moved to Milltown. (Ans. 11–14.) *It is probable that the work which witness saw Drawbaugh doing upon the screws and mouthpiece of Instrument A in the fall of 1874 consisted in the application of the adjusting screw at the center of the diaphragm, and the removal of the mouthpiece to one side of the center*, as explained in Mr. Drawbaugh's testimony. (D. Vol. 2.)

John H. Smith (D. Vol. 2, pp. 1093–8) visited Drawbaugh's shop in May, 1875 (Ans. 3), and was never there before nor since that visit. (Ans. 12.) While there saw Instrument A and took it in his hand; recollects particularly its general shape, and its mouthpiece shaped like mouthpiece of a bugle. (Ans. 7, 4.) Witness' date is corroborated by Dr. Updegraff, who was there with him. (Id. p. 1,082.)

Dr. C. E. Updegraff (Id. pp. 1081–93) was at Drawbaugh's shop about May 5, 1874 (Ans. 1–3); again about April 20, 1875 (Ans. 4); and again, about May 15, 1875 (Ans. 9); and thinks he was never there afterwards. (Ans. 13.) At either his first or second visit saw Instrument A there. (Ans. 26.)

Jacob R. Vannasdale (D. S-reb. pp. 788–798) was at Drawbaugh's shop with Jacob F. Ensminger on February 2 and 3, 1875 (Ans. 18), and was never there before nor since. (Ans. 18, 19.) While there on that occasion, saw Instrument A (Ans. 28), and recollects that he thought that the mouth orifice was to look into, and asked Mr. Drawbaugh whether such was the fact, or not, and Mr. Drawbaugh laughed about it. (Ans. 29, 30.)

JOHN M. WAGGONER (D. Vol. 1, pp. 122-128) was at Drawbaugh's shop in November, 1874 (Ans. 1-8), and saw machine A there. (Ans. 9.) Drawbaugh told witness that he had talked through it, and had it perfected. (Ans. 24.) Witness is positive about Instrument A, because he had it in his hand and looked at it, and recollects the mouthpiece at one side of the center as it is now, and the electro-magnet on the side opposite the mouthpiece. (Ans. 27-29.)

Drawbaugh said at the time that it was perfected, and he was going to patent it, and if he got a patent on it, *it would be the first patent on a talking machine in the United States, or probably in the world;* but like all other machinery there would be improvements made on it in the course of time. (Ans. 24, 30, 37.)

JOHN WEBER (Id. pp. 244-8) was never at Drawbaugh's shop but three times, to wit: first, In the latter part of December, 1874; second, In the last two days of December, 1874; and third, At the latter end of January, 1875. (Ans. 4, 5, 20-22.) While there on the first visit, saw Instruments B, F, C and A. (Ans. 5½, 9, 13.) Drawbaugh said at the time that A was a receiver—"to receive what is talked," and F was a transmitter to talk into, and held Instrument A to his ear to explain the mode of using it. (Ans. 10-11.)

JOSEPH M. WISLER (Id. pp. 392-6) moved away from New Market, York county, in the spring of 1874 (Ans. 8-10); and while living at New Market, saw Instrument

B, at Drawbaugh's shop. (Ans. 13.) In the spring of 1875, saw Instruments D and E there, (Ans. 18), which Drawbaugh said he had just finished. (Ans. 19.) Prior to seeing Instruments D and E there, and it might have been a year prior, but witness is not positive how long, saw Instrument A at Drawbaugh's shop. (Ans. 20, 33.)

JOHN WOLF (D. Vol. 2, pp. 673-8), hauled the Axle Company's machinery to Drawbaugh's shop in February and March, 1875 (Ans. 1, 5), which date is verified by his account books (Ans. 3) and never was in the shop afterwards until the winter of 1879-80. (Ans. 13-15.) When hauling the Axle Company's machinery to the shop, saw various talking machines there, and, among others, Instrument A. (Ans. 7, 11, 20, 23.)

From this testimony it appears that forty-four witnesses besides Daniel Drawbaugh saw Instrument A at his shop prior to February 14, 1876; thirty-two prior to June 2, 1875; and sixteen prior to the beginning of 1875; and of the forty-four, fifteen bear testimony to its actual use for receiving articulate speech prior to the filing of Mr. Bell's application for his patent of March 7, 1876, and even prior to his first experiments. There can be no mistake about the dates fixed by these witnesses, for fifteen of them, viz., Eppley, Sarah E. Evans, McCleaf, Millard, Peterman, John F. Rupp, Scherich, Shopp, D. W. Smith, Dr. C. E. Updegraff, Vannasdale, Ensminger, Weber and Wolf, have never been in Drawbaugh's shop since February 1, 1876, and most of them never since June 1, 1875. It is therefore clearly established that Instrument A anticipates Mr. Bell's invention.

Exhibits D and E.

We come, then, to the next set of Mr. Drawbaugh's telephone instrumsnts, in the order of their development by him, viz., the magneto-telephone instrument "D" and "E."

Drawbaugh gives a full history of these two instruments. (D. Vol. 2, Ans. 243–266, pp. 791–794.) They were made after A (Ans. 246), but before "L" and "M" (Ans. 295) "G," "O" (Ans. 297) and "H" (Ans. 293, 294, 297.) They were made under Daniel Drawbaugh's directions, part of the work being done by him and part by Harman K. Drawbaugh. (Ans. 243.) The *original instruments* are in evidence as Exhibits "D" and "E," and are illustrated on page 6 of defendants' book of drawings, and fully described by Mr. Drawbaugh (Ans. 244, 250); Knight (D. Vol. 2, Ans. 120, 124, pp. 718–9); and Park Benjamin (Id. pp. 1191-5, 1214, Ans. 36, 37, 55). Mr. Benjamin testifies concerning them as follows, p. 1214:

> "The instruments 'D' and 'E' show the magneto-telephone in as compact a form as it has ever been constructed, up to the present time. The magnet is flattened and curled, so as to occupy the least possible space; the means of adjusting the distance between the core and diaphragm is simple, positive, and easily controlled; *and the instruments themselves, as I have proved, are excellent working, speaking telephones on a circuit without a battery.* They embody all the elements going to make up a speaking telephone, as described in Bell's two patents in suit; and, in fact, I see no reason why, if these machines were now manufactured and were upon the market, they would not, so far as form, construction and operation are concerned, successfully compete with any forms of magneto-telephone now in vogue."

As to their "excellent working" qualities, Mr. Benjamin testifies not from theory only but from personal tests made by him, as set forth in his answer 36, pp. 1193-4. They were also tested at New York City, in March, 1882, in presence of complainant's counsel and experts (see D, Vol. 2, pp. 1250-1), with many other of Mr. Drawbaugh's telephones; and the character, method, and resusts of these tests are fully set forth by Mr. Benjamin (pp. 1251-91). In these tests the original instruments, A, D, E, H, and others were used. At the beginning of the New York tests the wire of Exhibit D, which had become old and rotten, broke off at the surface of the electro-magnet, and, as defendants' counsel did not wish the coil to be changed in any respect by unwinding and rewinding, but, on the contrary, desired the instruments to remain in exactly their original condition, this Instrument, D, was laid aside, and its companion-instrument, E, was tested in its place, both as a transmitter and receiver, with different varieties of telephones in circuit with it. Two lines were employed, one equipped with Bell instruments and one with Drawbaugh instruments; and it was demonstrated by actual trial of the fact, that Instrument E could be substituted for either of the Bell instruments, and would transmit or receive speech with equally good articulation, eliciting the favorable comments of even the complainant's experts, Mr. Pope and others. Mr. Benjamin, D. Vol. 2, p. 1277, testifies as follows:

"Q. 136. You mentioned the fact that Mr. F. L. Pope listened in the front room at Instrument 'A' or 'E,' or both; after listening did he make any remarks indicating his satisfaction, or want of satisfaction?

"A. I was present in the room when Mr. Pope listened at the two instruments named, and I instructed the stenographer present on behalf of the defendants, to be particularly careful in noting down exactly what Mr. Pope said, if he should say anything at all, with regard to them.

On the stenographer's notes I find the following, which accords with my recollections of what Mr. Pope said:

"After hearing Judge Hill read to him the article already quoted in one of my previous answers, beginning 'Last Wednesday in San Francisco, a Mrs. Andrews,' which Mr. Pope heard through Instrument 'E,' the words being spoken into Instrument 'H' at the other end of the line, Mr. Pope said: 'I had no trouble at all in hearing anything spoken through Drawbaugh's instrument, and it compares as favorably with any telephone as I ever heard. Words that were indistinct was the fault of the transmitter and not of the receiver.'

"Mr. Pope also listened at Instrument 'A' to speech transmitted through Instrument 'H' and the line. During the course of the article on the new wheat regions, quoted in one of my previous answers, Mr. Pope said: 'That is good enough. Let the other man try it now.' I asked him, 'Don't you think it (meaning Instrument 'A') is as good as 'E'? Mr. Pope answered, 'That is first rate.' Mr. Pope then continued listening, and after another quite long section of the same article had been read to him—said section being quoted in one of my previous answers—said: 'That is enough.' I asked him, 'How is that for a receiver?' (meaning Instrument 'A.') He answered, 'That is very good indeed.'"

Mr. Frank L. Pope, complainants' expert, on cross-examination, testified as follows:

"Re-cross Q. 401. (C. Vol. 2, p. 1450.) Assuming that Drawbaugh made the instruments D and E in the early part of 1875, and that he either made the permanent magnets himself or employed the village blacksmith at Eberly's Mills to make them for him, would you expect them to be made of tungsten steel, and would you not consider it highly probable that they would partially lose their magnetism in the course of seven years?

"A. I don't think they would be likely to be made of tongsten steel, under the circumstances; *and hence it is possible that magnets so made might lose a portion of their magnetism during the length of time mentioned.*

"Re-cross Q. 402. If they did lose a portion of their magnetism, then the sounds transmitted and reproduced through such instruments would be proportionally weaker and fainter, would they not?

"A. *They would be weaker certainly.*

"Re-cross Q. 403. Considering that the instruments D and E were made with wooden boxes, liable to shrink and warp with age, and had been taken apart and put together a great many times by the draftsman, the counsel and the witnesses in the progress of this case, and had been transported by railroads and express companies, in a trunk, with a quantity of other materials, in addition to having been handled for several years prior to the institution of this suit, would you expect their conditon to be as good at the time the tests were made as when they were new?

"A. That might, or might not be the case. A magneto instrument will stand a great deal of rough handling without apparent injury, and its parts are very easily placed in proper relation to each other after having been displaced by rough usage. *Nevertheless, it is probable that the instrument would not perform as well after undergoing the vicissitudes mentioned in the question as when new.*"

And, after hearing these old original instruments tested, Mr. Pope was constrained to state, in his examination in chief by complainants' counsel (C., Vol. 2, pp. 1378-9), as follows:

"*I think that instruments like E might be successfully employed for practical use*, especially if there were no better ones to be had. *The articulation of E seemed to be very good*, but the sound was wanting in volume and loudness."

And, on page 1380, as follows:

"Q. 102. From the stenographer's notes, quoted on p. 1325 of Mr. Benjamin's deposition, it appears that some special pains were taken to report 'exactly' what you said on one occasion during the tests. It is evident, from the ingeniously bad grammar of the reporter, that he did not report 'exactly' what you said. Did you form or express the opinion that E or A were as good as the receivers in ordinary use, and to which you have been accustomed, such as the 'pony-crown' or 'butter-stamp' forms?

"A. *The remarks attributed to me, I think, are correctly reported with the exception of the first one.* I have no recollection of using the expression, 'And it compares as favorably with any telephone as I ever heard.' I do not believe that I made use of this expression, *although it is not unlikely that I used a phrase similar to that quoted, as to the articulation of the receiver.* The context seems to indicate that such was the case, inasmuch as the expression quoted is immediately followed by the following: 'Words that were indistinct was the fault of the transmitter and not of the receiver.' I did not at any time form an opinion that Drawbaugh's apparatus, as a whole, compared favorably with any telephone I ever heard. *It is quite possible that I may have said that the articulation of E was as good as that of other telephones,* but I did not think it equal to others in volume of sound, and certainly did not intend to say so."

We prefer to take the reporter's notes, made at the time, of what Mr. Pope said, rather than Mr. Pope's memory, a year afterwards, and after full consultation with complainants' counsel. In either case, however, here is the admission of complainants' expert that Drawbaugh's instruments A and E were good articulating speaking telephones, even after many years of rough usage and natural decay, and that instruments such as E can be "successfully employed for practical use" on "telephone lines."

As to the rough usage to which Mr. Drawbaugh's instruments had been necessarily subjected during the progress of the suit, see Mr. Benjamin's answer 115, D. Vol. 2, pp. 1254-6, and Drawbaugh's answer, 257, 258, p. 793. It is quite remarkable that instruments, after such handling, should remain capable of any results whatever; yet these instruments still talked, and could be used interchangeably with the modern improved telephone. Drawbaugh testifies (Ans. 1758, p. 1080) that three years prior to the commecement of this suit they were in better condition than when he was giving his testimony. The complainants' counsel, in their brief, in the Overland case, referred to these two instruments as follows:

> "D and E are a pair of magneto instruments with permanent magnets. *They are highly organized* inclosed in turned black walnut cases, *and with most of the refined improvements of detail found in the best commercial instruments of to-day*, though they are rather feeble." (P. 77.)

The two instruments, D and E, here in evidence, were made in the latter part of the winter of 1874–5, before the Axle Company got its new machinery into the shop in March, 1875; and, from that time to this, they have been in existence, and in an operative condition. After they were first made, no change was ever made in them, except the cutting of a slight recess in "D," immediately below the diaphgram (D, Drawbaugh, D. Vol. 2, pp. 792–3, Ans. 254), which, however, had no effect on the operation of the instrument (Id. Ans. 255, 256; P. Benjamin, p. 1195, Ans. 37), and except the occasional testing of diaphragms of different thickness on them (Drawbaugh, Ans. 1700), the magnets and electro-magnets have never been changed since the instruments were first constructed. (Id. Ans. 1700.) A little screw plug was, at some time prior to the filing of the instruments in evidence, lost from Instrument E, and the bottom cover at an early time, from Instrument D (Ans. 251–254), but otherwise the instruments are identically as first made, wear and tear excepted.

The evidence which fixes the date of D and E, as prior to February 14, 1876, and even months prior to Bell's earliest experiment of June 2, 1875, is as follows:

DANIEL DRAWBAUGH (D. Vol. 2) knows that while the Axle Company was running at the shop (March, 1875, to February 29, 1876; J. A. Moore, D. Vol. 1, p. 614), he had "D" and "E," and may have had them prior to the Axle Company, but is unable to recall the date when he first made them. (Ans. 401, p. 827–8.) He remembers that parts of them were made by himself, and parts by Harman K. Drawbaugh, under his directions (Ans. 243); that there was one of them made and Harman made or helped to make the other. (Ans. 265.)

HARMAN K. DRAWBAUGH (D. Vol. I, pp. 550–71) saw one of these instruments, D or E, as far back as January, 1875, and the other not more than ten days or two weeks thereafter. (Ans. 44.) They both worked satisfactorily some time before the Axle Company got its machinery in there. (Ans. 47.) Witness talked through them and saw others talking through them (Ans. 48), and often listened at them (Ans. 49), and could hear and understand what was said. (Ans. 50.) Witness commenced working directly for the Axle Company on March 29, 1875 (Ans. 37), which date he fixes by his account book (Ans. 163; and see, also, Moore, Id. pp. 618–19, Ans. 18), and saw instruments "D" and "E" a month before he began work for said Company. (Ans. 51.) For the use of "D" and "E" a long telephone line was established in the shop, by extending the wires up into the garret and winding them back and forth several times from one end of the building to the other, to gain length or distance (Ans. 96, 97), and they were used on that line. (Ans. 98.) At first, they were tested with batteries. (Ans. 100, 101.) Witness spoke through them quite often. (Ans. 102.) Before making "D" and "E," Daniel Drawbaugh had two similar machines, which were roughly made, and in January and February, 1875, he and witness made new cases and practically reconstructed the machines, producing them as they now exist. (Ans. 117–128.) *They have not been changed in any way since that time.* (Ans. 129.) *Witness could, at any time from January or February, 1875, to the present time, from his unaided memory, and without having "D" or "E" before him, have reproduced substantially similar machines, except in point of perfect accuracy as to size.* (Ans. 130.) Witness himself forged one of the curled permanent magnets found on these instruments (Ans. 131), and his uncle, Daniel, made the other. (Id.)

Jacob R. Vannasdale (D. S-reb. pp. 788–798), was at the shop with Jacob F. Ensminger, on February 2 and 3, 1875, and saw a part of "D" or "E" which was then in course of construction.

> "Now we saw this curled magnet" [indicating the curled permanent magnet on Exhibit "D"], "but it was not put together this way. This curled magnet, it appears to me, was lying with these others, but not fastened to any block; I know we was looking at this curled magnet, and he told us that it belonged to a talking machine; this mouthpiece here ('E'), I don't recognize that; I may have seen it there, too." (Ans. 28, p. 791.)

Witness was never in the shop after February 3, 1875, (Ans. 18.)

Jacob F. Ensminger (D. S–reb. pp. 808–815), who was there with Vannasdale on February 2 and 3, 1875, a few days after the explosion of Wilson's store on January 19, 1875 (Ans. 12, 13, etc.; C. Exhibits, p. 401), testifies (p. 811) as follows:

> "Here are three, the only ones that I can identify" [taking up "A," "D," and the permanent magnet of "C reproduced"]. "This one" [taking up Instrument "D"] "I can identify only in part."

"Q. 25. What part of the Instrument "D" is it that you can identify?

A. The magnet only.

Q. 26. At the time when you were there at Mr. Drawbaugh's shop, where did you see this magnet which now appears on Instrument "D," and what, if anything, was said or done about it while you were there?

A. It was lying on Mr. Drawbaugh's work-bench in the shape that it is now, only that it wasn't polished and finished as it is now; he had just worked it out of the rough, and said that it belonged to his talking machine.

Q. 27. Referring to this curled magnet that you are now speaking about, did Mr. Drawbaugh say what, if anything, he was doing with it or about it at that time, so far as you remember?

A. I do not remember that he said or was doing anything about it, more than he said it belonged to his talking machine; that is all I remember about the curled magnet; the reason that I call it that—I heard him speak about it."

This witness never was in the village of Milltown in his life, except on that one occasion. (Ans. 1.)

Augustus Kahney (D. S-reb. pp. 254-266.) Helped to get the Axle Company's machinery into the shop and clean it up in the spring of 1875. (Ans. 31-39, p. 258.) This machinery was hauled there by Wolf on different days from February 20 to March 31, 1875 (Wolf, D. Vol. 2, p. 674), and was paid for by cheques in March, 1875. (Moore, D. Vol. 1, p. 617. Ans. 15, 16.) At that time witness saw "A" and an instrument which he describes as follows: "One was about two "inches through, and, as near as I can tell, from an inch "to two inches high, with a mouthpiece on top of it." (Ans. 40.) Having thus described the machine, he was sent with the examiner, Mr. Ott, to the examiner's office to look at the exhibits there, and immediately identified instrument "E" as the one to which he had referred. (Ans. 47, and Examiner's certificate following.)

GEORGE A. MAY (D. S-reb. pp. 982-995) was at Drawbaugh's shop in March, 1875 (Ans. 19-20), while living with Jonathan Fry (Ans. 21, 1-6), to get a razor ground. (Ans. 22, 23.) He delivered the razor to Drawbaugh at his house (Ans. 23, 24), and got it back from him about two weeks afterwards at the shop. (Ans. 25, 26, 27.) When he took the razor to Mr. Drawbaugh's house, Drawbaugh was living in the house at the blacksmith shop, which he sold to Fettrow in March, 1876, and never lived in afterwards. (Ans. 141, 142; also see testimony of D. Drawbaugh and D. Fettrow.) When he went to the shop to get the razor, the axle work was going on. (Ans. 38, 39, 40, 41.) He then saw "D" and "E" (Ans. 42), and Drawbaugh and witness talked to each other through them (Ans. 43, 33), witness using the same instrument both as a transmitter and a receiver. (Ans. 45, 46.) He heard and understood both words and music through the instruments (Ans. 47-56), and states some of the conversation that was carried on through them at the time. (Ans. 51, 55.) Witness thinks he saw "H" there at the same time, but in this he is probably in error—he did not use any talking machines except "D" and "E" (Ans. 56), nor examine "H" closely (Ans. 61), nor handle it (Ans. 62), nor was it explained to him (Ans. 63), and he probably confounds some other instrument with "H." But he did see and handle and converse through "D" and "E," and cannot well be in error as to them. The instruments, too, *talked both ways*, which would clearly indicate "D" and "E," or else "C" and "I," and he could hardly mistake "C" or "I" for the small instruments "D" or "E."

Daniel Fettrow (D. Vol. 1, pp. 347–60) was down at Drawbaugh's shop when the Axle Company were putting up their machinery (March, 1875), to get instructions about making some levers for said company. (Ans. 16.) The first work which he did for said Company is shown by his books to have been done on March 26, 1875. (Ans. 5–8.) While witness was there to get said instructions, Drawbaugh showed him Instrument "D" or "E" (Ans. 18), which witness (a blacksmith) identifies by the curled magnet (Id.), and they conversed together through the machines. (Ans. 16–22.) Witness used the same curled magnet instrument both as a transmitter and a receiver (Ans. 20), and remembers some of the conversation that was carried on by him and Mr. Drawbaugh through the machines. (Ans. 16–18.) The instrument which witness used, not only had a curled magnet on it, but was of the size of "D," and had a mouthpiece similar to that of "D." (Ans. 21.) Witness did not see the instrument that Drawbaugh used (Ans. 19), but it was probably "E," as they talked both ways.

Michael M. Grove (Id. pp. 662–5), a member of the Axle Company, testifies that shortly after the Axle Company copartnership agreement of December 23, 1874, was signed (Ans. 1–4), Drawbaugh showed him the talking machines, and told him they could talk to Pittsburg (Ans. 1), and he states that Exhibits "A" and "D" look to him as if they are the ones that Drawbaugh then showed him. (Ans. 6.)

Jeremiah Fry (Id. pp. 143–50) saw "B," "F," "A," "D" and "E," on or about April 9, 1875 (Ans. 7, 13), and Drawbaugh sang to him through some of them (Ans. 14), and stated that he could talk as far as the wire goes (Ans. 18). Witness identifies "D" or "E," as the machine which he used, but cannot say which, as they are almost exactly alike. (Ans. 19, 20.) He fixes the date by a book entry of the transaction which took him to the shop that day, viz.: the sale of some potatoes to Mr. Drawbaugh. (Ans. 8–11.)

JOSEPH M. WISLER (Id. pp. 392–6) saw "D" and "E" at Drawbaugh's shop in the spring of 1875 (Ans. 18). Drawbaugh said he had just finished them, and that you could put one to your mouth and talk and the other to your ear and listen, at the same time. (Ans. 19.)

DR. C. E. UPDEGRAFF (D. Vol. 2, pp. 1081–93) was at the shop between April 18–20, 1875 (Ans. 4), and again with John H. Smith and others, about May 15, 1875 (Ans. 9–11), and thinks he has never been there since. (Ans. 13.) When there in April, 1875, he saw "D" (Ans. 27), which he having been an oculist and aurist (Ans. 68), identifies by the resemblance of the curled magnet to the external part of the human ear (Ans. 4, 7, 27). Drawbaugh talked to him through the instruments and he could hear and understand what was said (Ans. 30). Drawbaugh explained the business uses that could be made of the machines (Ans. 37), and told him they could talk as far as they could use the ordinary telegraph wire (Ans. 35). Witness fixes the date by his book account (Ans. 4, 47).

JOHN H. SMITH (Id. pp. 1093–98) was there with Dr. Updegraff, in May, 1875 (Ans. 3), and was never there before or since (Ans. 12.) He identifies "D" as looking like one of the talking machines that Drawbaugh showed him there that day. (Ans. 4, 8.)

ORLANDO KAHNEY (D. S.-reb. pp. 224–247) while working with Milton Basehore for Wilson Walters, in the summer of 1875, was down at Drawbaugh's shop with

Basehore to grind cradle-scythes for cradling Mr. Walters' oats (Ans. 8, 12, 13, 14) and while there that day Drawbaugh talked to him through the talking machine and he heard and understood what was said (Ans. 8, 9, 10). He described the instrument at which he listened as "round, flat on two sides," with "a hole on one side as a mouthpiece," and as about two inches or two-and-a-half in diameter, (Ans. 23, 25,) and says he held it in his hand and applied it to his ear while listening (Ans. 8, 24). He did his last work for Mr. Walters on Sept. 11, 1875 (Ans. 30-32; and see Basehore, Id. p. 116, and Walters, Id, p. 121, in corroboration of the date). Basehore (Id. pp. 116-121) fully corroborates Mr. Kahney's testimony as to the facts occurring at the shop that day. The oat harvest generally occurs in July, in that part of Pennsylvania (Basehore, Ans. 11), so that the occurrence at the shop must have taken place in June or early in July, 1875.

Jacob B. Fry (D. Vol. 1, pp. 98-106) saw "D" and "E" at Drawbaugh's shop in May or June, 1875, as nearly as he can fix the date, (Ans. 23, 12). He identifies them by their shape and by the curled magnets (Ans. 21, 22, 23). This was while the Axle Co. were in operation there (Ans. 60). One of the instruments was entire like "E," the other had its bottom cover off, like "D." (Ans. 61).

Jacob E. Shettle (Id. pp. 206-25) saw "D" and "E" at the shop "about the year 1875" (Ans. 25).

John H. Stephen (Id. pp. 248-53) saw "D" and "E" there in 1875 (Ans. 17). He states that he remembers the curled magnet on "D" very well.

Jacob S. Shopp (Id. pp. 309-92) saw "D" and "E" there in 1875, the last time that he was ever at Drawbaugh's shop. (Ans. 18–22). He next met Mr. Drawbaugh in Mechanicsburg, in February, 1876 (Ans. 26, 29), when Drawbaugh said he would exhibit at the Centennial if he could raise funds enough to do it, but hadn't the money to go ahead as he would like. (Ans. 27, 28.)

EPHRAIM R. HOLSINGER (Id. 360–374) saw Drawbaugh make the instruments "D" and "E" and remembers experimenting with them about the middle of the summer of 1875. (Ans. 23, 32, 34.) Talked very frequently through "D" and "E" (Ans. 33, 35, 36), and could distinctly hear and understand what was said through them. (Ans. 36.) They could both speak and hear through either of them. Witness moved away from Milltown on November 27, 1876, and has never been there since. (Ans. 6, 9.) This witness assisted Drawbaugh a great deal in his telephone experiments, while living at Milltown from September, 1873 (Ans. 4), to November 27, 1876, and his testimony is very interesting and important on all grounds. Complainants have endorsed him by calling him as their witness also.

HENRY F. DRAWBAUGH (Id., pp. 396–413) began running a line of cars in May, 1876 (Ans. 19), and stopped in the summer of 1878 (Id.) He saw and talked through instrument "D" before he began running the cars, and he thinks the summer before (Ans. 71, 79.) "D" was used both as a transmitter and a receiver (Ans. 80). He thinks it had the bottom cover on at that time (Ans. 96). He identifies it by the curled magnet on the back of it (Ans. 71).

WILLIAM H. BATES (Id., pp. 419–26) saw "D" and "E" in August, 1875 (Ans. 18).

GEORGE L. HALE (Id., pp. 472–77) saw "D" in the fall of 1875. Drawbaugh said it was improvement on his his former instruments (Ans. 16, 31, 32).

Jonathan Balsley (Id. pp. 107-13) lost his wife on Oct. 22, 1875, and immediately afterwards visited friends at Milltown to divert his mind from his troubles. While there was at Drawbaugh's shop and saw an instrument such as "D," a "round piece of wood" with a mouthpiece, and with a curious curled iron at its back. (Ans. 5, 6, 10, 15, 16, 17, 18, 19.) Recollects it distinctly (Ans. 15). Drawbaugh explained that it was a talking machine (Ans. 20.) Saw two such instruments at that time (Ans. 29, 30). Saw other talking machines at the same time, but can identify "D" and "E" better than any others because the curled irons came a little in witness' line of business—he was a blacksmith (Ans. 31, 1). Witness fixes his date by a newspaper paragraph on the death of his wife (Ans. 10) and by reference to her tombstone. (Ans. 28.)

Andrew Evans (D. S-rep. pp. 1-37) saw "D" and "E" at Drawbaugh's shop about December 1, 1875 (Ans. 62-63), and Drawbaugh talked through the talking machine, at that time, to Jacob Evans, who, with several other persons, was present in the shop (Ans. 68, 56). Drawbaugh told them he could talk across the ocean to Europe with these machines (Ans. 69).

Margaret Jane Erb (Id., pp. 47-52) was with her brothers, Andrew and Jacob Evans, and her sister and Jacob Evans' wife, at the time referred to by Andrew Evans, and corroborates his testimony. She, also, identifies "D" and "E" as seen by them that day at the shop. (Ans. 35). Was never in the shop at any other time. (Ans. 24.)

Sarah E. Evans (Id., pp. 55-60), another of the same party, corroborates the facts stated by Andrew and Margaret, and identifies "D" as one of the machines seen by them. (Ans. 28.)

Mary A. Evans (Id., pp. 61–74), wife of Jacob Evans, and one of the party who were with Andrew at the shop about December 1, 1875, corroborates the testimony of Andrew, Margaret and Sarah, and also identifies Exhibit "D." (Ans. 31.)

All these Evans witnesses are corroborated, both as to facts and date, by a great mass of evidence of different kinds and of the most conclusive character, printed in defendants' subrebuttal (pp. 1–95). The visit by Andrew, Sarah and Jane to Jacob and wife was made while Jacob was living in the old rough-plastered house on the hill, which he occupied only from September, 1875, to April 2, 1876. It was also made while Andrew was working for Ambrose Knaub, for whom he never worked except from November 6 till about December 4, 1875. It was also made during the same fall when Underwood's barn was built; and the dates of these several events are fixed beyond all question. Andrew, Margaret and Jane reported the facts, and the remark of Drawbaugh about talking to Europe, on their return home to Dillsburg, York county, Sunday evening, and the family and others bear witness to it.

Daniel B. Condry (D. Vol. 1., pp. 138–43) saw "D" and "E" at Drawbaugh's shop on Christmas day, 1875. (Ans. 8, 4, 5.) Drawbaugh said that he had used them to talk through (Ans. 10), and showed witness how they were to be used. (Ans. 32.)

Isaac B. Millard (Id., pp. 324–34) moved from Harrisburg onto his farm on August 20, 1874 (Ans. 9), and, sometime in 1875, while going back and forth to Mechanicsburg, saw "D" and "E" at Drawbaugh's shop. (Ans. 41, 43, 44.) Witness' last visit to the shop prior to 1880 was sometime before the opening of the

Centennial (Ans. 46-47), and was in cold weather. (Ans. 48.)

John Simmons (D. S-reb. pp. 427-441) was at the shop with Jacob Evans about November, 1875 (Ans. 7, 8, 15), and saw "E" and other talking machines. (Ans. 17.) Had heard of Mr. Drawbaugh's talking machines before that. (Ans. 18, 19.) When there with Evans in the fall of 1875, Drawbaugh talked through the instruments to them. (Ans. 11-15.)

All the above witnesses were examined in the "People's" case. Subsequently, in the Overland case, several others corroborated the priority of these two instruments, D and E.

Abram Marquart (Add. Proofs, pp. 113-120) gives very important evidence, verifying his dates by his books. He was a life insurance agent at Newville, Cumberland county, Pa., thirty miles from Milltown, and is one of the most prominent and reputable citizens of the county. On February 27, 1872, he insured the life of Mrs. Fettrow, of Milltown, and carried the insurance along from year to year until December 1, 1875, when she surrendered her policy and took a paid-up policy instead. (Ans 12, 17.) *His last visit to Milltown was on December 1, 1875.* (Ans. 17.) While visiting Milltown from time to time to see Mrs. Fettrow, between February 27, 1872, and December 1, 1875, he occasionally visited Drawbaugh's shop, hoping to get him to take a policy, which Drawbaugh desired to do, but was too poor to incur the expense. (Ans. 18-32.) His last visit to Drawbaugh's shop was between the 27th day of February, 1875, and the middle of March, 1875 (Ans. 21), which dates he fixes by his life insurance books. (Ans. 7, 23-25, 31, 33, 50-58.) While at Drawbaugh's shop on that occasion he saw Mr. Drawbaugh working on one of these two instruments (Ans. 38–48), and had a conversation with him about it, its features, purposes and principle of operation. In that conversation Drawbaugh told him that it worked by electricity (Ans. 43), could talk at any distance by means of connecting wire (Ans. 44), and spoke about getting it patented, but said he was too poor to have it done. (Ans. 45.) The witness describes the machine from memory (Ans. 38, 39) and recollects the fact that Drawbaugh used the term "curved magnet" in speaking of the permanent magnet at the back end of the machine. (Ans. 38, 41.) The machine was to take the place of telegraphing (Ans. 42), but was to do it by *talking* to a distance (Ans. 44). This is the statement of a man than whom no man stands higher in that county for every characteristic that gives weight to human testimony.

George W. Longnecker (Add. Proofs, pp. 155–160) was at Drawbaugh's shop at some time prior to the Centennial (Ans. 4–7), and saw what were undoubtedly the instruments D and E. He describes them in answers 22–32, so as to leave no reasonable doubt of that fact.

In the Overland Record (Add. Proofs, pp. 36–113, 120, 121), there is also a great mass of evidence corroborating the facts and dates testified to by Dr. C. E. Updegraff and John H. Smith in the People's case.

In the People's case Dr. Updegraff, John H. Smith and Thomas Updegrove (D. Vol. 2, pp. 1081–1102), had testified that Dr. Updegraff and Mr. Updegrove had visited Drawbaugh's shop together in the spring of 1874 and had seen various telephone instruments at that time, including instruments B, C, I; that Dr. Updegraff and one J. M. Boyle had visited the same shop in April, 1875, and had, a few months later, again visited it in company with John H. Smith and a Mr. McGaffick, on which latter two occasions they had seen all the telephone instruments, including F, B, C, I, A and D or E, and talked successfully through some of them. Dr. Updegraff, *who was an aurist*, had his attention attracted to the curved magnet on the back of D or E, *by its curious resemblance to the external human ear*. Smith noticed the curious resemblance of the mouthpiece of one of the instruments (probably A) to the mouthpiece of a bugle. (Ans. 4, 7.) They had a great deal of important conversation at the time with Drawbaugh, all of which should be read in order to appreciate its weight.

At the hearing below in the People's case, the dates fixed by these witnesses for the two latter visits (the spring of 1875, in April, May or June) were vigorously attacked by complainant's counsel, who pointed out two apparent errors, viz.: first, that Zacharias was running Hake's Mill, which they visited on the earlier of these two visits, and Zacharias himself had sworn, early in the case, that he took charge of that mill *in the spring of 1876;* and, secondly, that Smith had testified that on the latter of the two visits he had gone up to *a grocery store* to get some supplies, whereas the grocery store had been blown up on January 19, 1875, and had not been rebuilt till the fall of 1875, and hence, it was argued, the visits could not have been made till after the spring of 1876. Judge Wallace concurred in that view in his findings in the case, although the testimony of Updegraff and Smith was so clear, circumstantial and positive that it ought to have been received with controlling confidence.

Afterwards, the Overland Company, in making up its evidence, investigated the facts anew, and found that the complaimants' objections to the dates fixed by Dr. Updegraff and Smith were themselves founded upon error, and that the dates fixed by said witnesses were correct, and introduced a mass of evidence on the subject which not only did away with the objections urged against these dates, but corroborated the testimony of the witnesses with simply overwhelming force.

First, Hake, the mill owner, was examined, and, producing his lease to Zacharias, conclusively proved that the latter took charge of the mill on or about April 1, 1875, and, therefore, was in charge of the mill when Dr. Updegraff and Mr. Smith visited it a few weeks later. (Add. Proofs, pp. 107–113.)

Secondly, Mrs. Fry, the wife of the grocer who reopened the store in the fall of 1875, was examined (Add. Proofs, pp. 120, 121), and testified that, intermediate between the blowing up and reopening of the store, a Mr. Gardner, the postmaster, kept groceries on sale in one of the front rooms of his house, which he used as a store during that short period.

This testimony answered the objections, but the Overland Company went on and proved by the testimony of *McGaffick* (Add. Proofs, pp. 36–40), *Brenizer* (*Id.* pp. 40–44), *Boyle* (*Id.*, pp. 44–72) *Stackpole* (*Id.*, pp. 72–81), *Irwin* (*Id.*, pp. 81–83), *John H. Updegraff* (*Id.*, pp. 83–90), *Goldsmith* (*Id.*, pp. 91, 92), *Strouse* (*Id.*, pp. 93-97), *Young* (*Id.*, pp. 97–100), and *Weaver* (*Id.*, pp. 100–102), that the visits were in May and June, 1875, and could have been at no other time or times whatever, and that the party, on their return home from these visits, described what they had seen, and were full of enthusiasm about the wonderful talking machines which they had seen.

Among these various witnesses, Mr. Stackpole identified *this very day of the last visit* by an entry in the expense account in his pocket memorandum book (*Id.*, p. 75, entry of "Fishing Excursion," under date of June 21, 1875); and Mr. William B. Irwin, one of the most prominent and reputable citizens of Harrisburg, testified in full to the statements made to him, at the time, about the talking-machines, by Dr. Updegraff and Mr. Boyle, in such way as to leave no room whatever for present doubt as to the correctness of their testimony in the matter. (See Irwin, *Id.*, p. 83, Ans. 21.)

This matter is treated of here at this point because, among the telephones seen and identified by the witnesses in question, Exhibits D and E are very prominent, Dr. Updegraff remembering and testifying to even the form of the permanent magnets on these machines, which he associated at the time with the form of the external human ear.

The attention of the court is particularly called to this chain of testimony. The ingenious attack made upon the dates, and the complete overthrow of the attacking party, is most convincing as to the entire reliability of the testimony. The internal evidence of the correctness and truthfulness of the testimony is very strong, and the minuteness and circumstantiality of the description and statements leave nothing further to be proved.

Here, again, is an array of witnesses, fortified by corroboratory facts, such as precludes all possibility of mistake. Thirty persons besides Daniel Drawbaugh testify to seeing "D" and "E" prior to the filing of Bell's application on February 14, 1876, and of these the majority testify to seeing them prior to June 2, 1875. A large number of these persons talked through the instruments at the time, and clearly heard and understood what was said through them. The witnesses describe the instruments, and distinguish them by size, shape and the peculiar curled permanent magnet at the back. One witness, Updegraff, an aurist, was struck by the curious resemblance of these magnets to the external ear of a human being; another, Balsley, a blacksmith, by the fact that they were a new form of iron such as he, although a smith, had never seen before. Harman K. Drawbaugh, who assisted in making them in January and February, 1875, says he could at any time from that day to this have reproduced them from memory alone. The instruments themselves are extant and in court, and even the complainants' expert is obliged to admit that their articulation to this day is perfect, and that instruments such as these could be put out and successfully used for practical business purposes; while their counsel admit, in their Overland brief that these instruments are highly organized, containing the most refined improvements in use at the present day, and one of the counsel, Mr. Dickerson, in his printed argument in the Overland case, characterized them as follows: "You can put them in a countryman's vest pocket—a pair of perfect magnetos. They embody the inventions of two patents; they contain the invention of Mr. Bell's first patent and of his second patent; they are perfect magnetos." (See Mr. Dickerson's printed arguments, p. 84.)

As to the dates there can be no argument. Vannasdale and Ensminger never were at the shop subsequently to February 3, 1875. Updegraff and Smith were never there after the middle of May, 1875. Sarah A. Evans never was there after that one visit of about December 1, 1875. Holsinger was never there after November, 1876. Harman K. Drawbaugh, Orlando Kahney, Jonathan Balsley, Vannasdale, Ensinger, Augustus Kahney, Daniel Fettrow, Jeremiah Fry, M. M. Grove, Updegraff, Smith, and others fix their dates, in some cases absolutely, and in others with close approximation, by book entries made in their business at the time. There is nothing wanting to render the proofs completely conclusive of every fact which the law requires to establish Drawbaugh's priority of invention.

The very fact that Judge Wallace based his conclusions in part upon an error into which he was led by complainant's skillful counsel, as to the date of the visit of Dr. Updegraff, Smith, Boyle and others, to Drawbaugh's shop, taking it to be after the spring of 1876, when in fact it was in June, 1875, is good reason why his decision should be overruled.

We have now proved the existence of at least four complete sets of telephone instruments at Drawbaugh's shops, besides instrument A, prior to the earliest experiment ever made by Alexander Graham Bell which even he can claim to have been a telephone experiment, viz., the old teacup transmitter and its receiver, instruments "F" and "B," instruments "C" and "I" and instruments "D" and "E"—all these instruments being in existence prior to June 2, 1875; three of them "A," "D" and "E," extant, entire and operative to this day; and four of them, "I," "C," "F" and "B," extant in great part to this day. But we have not yet concluded the overwhelming proofs of Drawbaugh's priority. A large number of witnesses, additional to those whom we have cited, testify to seeing talking machines, or talking through them, at Drawbaugh's shop prior to February 14, 1876, but are unable now to identify the particular instruments so seen or used; and another large class of witnesses testify to having heard of Drawbaugh's talking machines long prior to 1876.

We will now briefly advert to this additional corroborative evidence.

Unidentified telephones at Drawbaugh's shop.

In the Overland case, several witnesses were examined who gave evidence of the strongest character in support of Drawbaugh's claim to priority of invention, but were unable to identify the particular instruments employed. Prominent among these witnesses was HON. RICHARD J. HALDEMAN, member of Congress from the Cumberland, Pa., congressional district, for two successive terms, commencing March 4, 1869, and ending March 4, 1873, and his wife, MARGARETTA C. HALDEMAN (a daughter of ex-Secretary Simon Cameron). (Add. Proofs, pp. 102–107.) When making his first canvass for Congress, in the summer of 1868, Mr. Haldeman visited Drawbaugh's shop and inspected his telephones, and was satisfied from what he saw and what Mr. Drawbaugh told him at the time, that the problem of transmitting speech had been solved. Mrs. Haldeman accompanied him on his second canvass of the district, in the summer of 1870, and testifies that her husband then told her of his former visit, and that the instrument had been operated in his presence. She further testifies that Mr. Drawbaugh's invention was a matter of common talk in the community in the summer of 1870, and that it worked "by electricity," was designed to "carry the voice from one place to another," and "was spoken of as Drawbaugh's talking machine, and an improvement on the telegraph." There can be no mistake about these dates, nor can the truthfulness of such witnesses be questioned for a moment.

In addition to these witnesses, DR. GEORGE W. BOWMAN and his wife, MAGGIE E. BOWMAN (Add. Proofs, pp. 173–179), testified to visiting Drawbaugh's shop on the occasion of the baptism of Mrs. William R. Gorgas, prior to March 14, 1871 (see p. 177, Ans. 6, 7, 8), when Mr. Drawbaugh talked through the instrument to Dr. Bowman, who heard through them what was said, and remembers and repeats some of the words. He again heard the instruments talked through on some subsequent occasion. The date of Dr. Bowman's first conversation over Mr. Drawbaugh's telephones cannot be questioned, nor can the character and standing of both witnesses.

DAVID STEVENSON, JR. (Add. Proofs, pp. 141–155), also testifies to hearing talk over Drawbaugh's telephones before Drawbaugh moved out of the old house by the grist-mill, and therefore before April 1, 1869. He details the particulars as to the location of the instruments at the time, the way the wire was zig-zagged from post to post on the porch to give greater length of line, etc., etc. He is a witness whose character has been thoroughly endorsed by Mr. Storrow, in his argument below in the Peoples' case. (See remarks of Storrow, quoted in full on p. 142, Add. Proofs.)

LEVAN H. ORRIS (Add. Proofs, pp. 121–130) also saw telephones at Drawbaugh's shop and saw persons talking through them, in July, 1873. Drawbaugh tried to interest him in the subject, but his head was full of political matters at that time, and he took no interest in talking-machines.

The character of this witness is savagely attacked because there was an embezzlement in his office, or a shortage in his accounts as county treasurer, in 1876; but the testimony of Woodburn, his competitor for the office in 1873 (and who also saw Drawbaugh's telephones during the same month; Id., pp. 133–138), Wagner, state senator (Id., pp. 138, 139), Eckels, state representative (Id., pp. 139–140) and Graham, state representative (Id., pp. 140–141), shows that his reputation for truth and veracity is very high, and that the witness is held in high esteem in the community, and is regarded as the victim of other people's misdoings.

In addition to these six witnesses examined in the Overland case, a large number of witnesses examined in the People's case, testified to seeing, hearing, or knowing of, telephones at Drawbaugh's shop prior to February 14, 1876, although they are unable to identify the particular instruments.

CYRUS ORRIS (D. Vol. 1, pp. 170, 175) saw Drawbaugh's talking machines at different times from about the 1st of April, 1871, down to 1880 (Ans. 16). Took his son-in-law, Jacob E. Smith, down to Drawbaugh's shop to see the machines about April 1, 1871 (See Smith, Id. pp. 166–7, Ans. 12–20); Orris, pp. 170–1, Ans. 5–14.)

EZEKIEL WORLEY (Id. pp. 253–5), about the year 1873, saw the talking machines at Drawbaugh's shop (Ans. 7–20).

This statement is corroborated by John K. Taylor (Id. p. 634, Ans. 6–10).

N. W. KAHNEY (Id. pp. 275–80) saw the talking machines about 1872 (Ans. 10–20).

William Eppley (Id. pp. 280-83) visited Drawbaugh's shop for the last time in May or June, 1875 (Ans. 4, 5). Was there several times during the two years preceding that period (Ans. 6.), and had seen talking machines (Ans. 7).

Henry Bonholtzer (Id. pp. 384-87) was at Drawbaugh's shop in 1869, and saw talking machines there (Ans. 11, 14, 19, 21).

George H. Bowman (Id. pp. 466-70) saw talking machines in Drawbaugh's shop in February, 1876, at which time somebody was talking to Mr. Drawbaugh through them.

Charles L. Drawbaugh (Id. pp. 501-3) saw and talked through the talking machines at Drawbaugh's shop, a year or more prior to May 1, 1876, and heard and understood what was said through the machines.

David K. Ernst (Id. pp. 516-8) was at Drawbaugh's shop with John B. Bloser about the middle of June, 1872, and talked with Mr. Drawbaugh about the talking-machines, and thinks he saw them at the time (Ans. 4, 5).

This testimony is corroborated by John Bloser, both as to the time and the facts (Id. p. 518).

S. S. Rupp (Id. p. 572) was at Drawbaugh's shop with Mr. Hamacher and his scholars on February 1, 1876, and recollects that Mr. Drawbaugh at that time spoke about a machine that he had which he called a talking machine, but witness was interested in other things and did not pay much attention to it.

David M. Ditlow, (Id. pp. 573-4) saw Drawbaugh's talking machines about 1872, when Mr. Drawbaugh talked through it, and witness heard and understood through the machine what he said.

Mrs. Lydia Drawbaugh (D. Vol. 2, pp. 692-4), saw the talking machine in September, 1872, her sister, Mrs. George Free, being present at the time.

Mrs. Mary Free (Id. pp. 694–6), was with her sister, Mrs. Lydia Drawbaugh, at Daniel Drawbaugh's shop in September, 1872, when Mr. Drawbaugh talked through the machines to them, and she remembers hearing through the machines the words "Good afternoon, ladies!" Drawbaugh told them that the machine operated by electricity.

Jacob Evans (D. S-reb., 88–95), was at Drawbaugh's shop with his wife, his brother, Andrew, and his sisters, Margaret and Sarah, about December 1, 1875, and saw and talked through the talking machines.

Margaret Brenneman (Id. pp. 103–109), saw the talking machines at Drawbaugh's shop in 1869 (Ans. 19, 20).

George Natcher (Id. pp. 141–148), lived at Milltown in 1871, 1872, and never has been in the town since August 9, 1872 (Ans. 3–6). While living there he was at Daniel Drawbaugh's shop and saw and talked through the talking machines (Ans. 8–20). Talked and listened at the same machine (Ans. 14), and understood what was said through it (Ans. 15). The machines were on different floors (Ans. 16–20).

Mrs. B. B. Spangler (Id. pp. 176–178), sister of George Natcher, moved away from Milltown in 1872, and never has been there since (Ans. 3, 4). Talked into Mr. Drawbaugh's talking machines while she lived there (Ans. 6–7). Witness was so small at the time that Harman Drawbaugh had to lift her up to enable her to talk into the machine (Ans. 8, 9).

Henry L. Hamme (Id. pp. 322–328), was at Drawbaugh's shop either in the last of January or the beginning of February, 1876 (Ans. 2, 3), in company with

George Frederick and Jonathan Fry (Ans. 12), and saw and talked through the talking machine at the time (Ans. 17-22); heard and understood very plainly what was said through the machines, even when Mr. Drawbaugh talked in a whisper (Ans. 21-22).

GEORGE FREDERICK (Id. pp. 328-331) was at Drawbaugh's shop with Mr. Hamme and Mr. Fry in January or February, 1876, and saw the talking-machine.

JONATHAN FRY (Id. pp. 331-335) was at Drawbaugh's shop with Mr. Hamme and Mr. Frederick in the winter of 1875-6, and saw the talking-machines there.

WILSON G. FOX, late chief of police of Harrisburg, Pa., (Id. pp. 342-347) saw the talking-machine at Mr. Drawbaugh's shop about the year 1867 or 1868 (Ans. 3-5)—when the old faucet company was in operation there (Ans. 6-8). Prior to March, 1871, witness was employed in the carding room of the Harrisburg Cotton Mill (Ans. 21-3) and Drawbaugh came there to get material to wrap his wire (Ans. 20) which he had intended to use for the talking-machine (Ans. 27).

JACOB BARBER (Id. pp. 371-377) was a candidate for the office of County Commissioner of Cumberland County, in the summer of 1873, and in connection with that political campaign, had occasion to go to Mr. Drawbaugh's shop shortly after the death of George B. Heck. While at Drawbaugh's shop, saw the talking-machine there. (Ans. 13, 14.) Was never in the shop after July or beginning of August 1873 (Ans. 13).

WM. H. MARTIN (Id. pp. 827-836) was at Milltown with John Keefauver to get Mr. George Hosler to make him a pair of boots, while Hosler was living there. Hosler lived at Milltown only from March, 1872, to March, 1873. (See George Hosler's testimony Id. p. 367.) At that time witness and Mr. Keefauver went down to Drawbaugh's shop, and talked through the talking-machine there, from the basement to the attic.

Witness heard and understood what was said through the machines. They talked and listened at the same machines. (Ans. 48.) Had heard about Mr. Drawbaugh's talking-machine in 1869, and 1870. (Ans. 19-21.)

JOHN F. KEEFAUVER (Id. pp. 837-848) corroborates Mr. Martin in every particular, and also states that he talked through Mr. Drawbaugh's talking-machine with Jacob M. Sadler, in April, 1873, prior to the death of George B. Heck (Ans. 40-55) and that about two or three years before he ever saw the talking-machines he had heard a good deal about them (Ans. 34, 35), and first heard of them at a place seven miles west of Carlisle (Ans. 37, 38).

ABRAHAM DITLOW (Id. 876, 890) knew of Drawbaugh's talking-machine in 1874 (Ans. 11) and saw it and talked through it at that time (Ans. 36-39); had forgotten the fact, but was reminded of it by Mr. Alexander Milner of Porter County, Indiana, (Ans. 43-45) whom witness told about it in May or June, 1876, in Indiana. (See Alexander Milner, Id. p. 513, Ans. 5; C. B. Clifford, Id. p. 515, Ans. 8).

BENJAMIN K. GOODYEAR (Id. pp. 1011-1020) a lawyer and formerly under-sheriff of Cumberland County, Pennsylvania, testifies that, in 1871, witness seized the personal property of George W. Kissinger, of Milltown, upon an execution issued November 13, 1871, and returned "unsatisfied," December 4, 1871. On December 4, 1871, the attached property was appraised by J. B. Drawbaugh George B. Heck and Daniel Hart, appraisers, and was found to be less than the amount exempted by law.

A copy of the record of all these proceedings is printed on pp. 1012, 1015.

On December 4, 1871, the day of the appraisement, witness went to the workshop of Daniel Drawbaugh to find J. B. Drawbaugh, in order to summon him as an appraiser (Ans. 9, 10), and had to wait for him a short time at Daniel Drawbaugh's shop (Ans. 12). While waiting there Daniel Drawbaugh showed him his talking machines and talked through them to him, and witness heard him speak and understood distinctly the words that he spoke through the instrument (Ans. 12-15). Witness has never been in Daniel Drawbaugh's shop since, so far as he can recollect (Ans. 11), and never levied any other execution upon the goods and chattels of George W. Kissinger, at Milltown, since December 4, 1871.

ABRAHAM MAY (Id. pp. 1028-1037) did a job of work on Daniel Hart's house at Milltown in August and September, 1870, of which he produces his account-books (Ans. 8-13). Never did any work for Daniel Hart after that (Ans. 14). While doing that work for Daniel Hart, was down at Drawbaugh's shop to get a boring-machine mended which he was using in the work at Mr. Hart's house, and Daniel Drawbaugh showed him his talking-machines, and talked through them from one floor of the shop to another (Ans. 24-30). Witness understood and heard through the machines the words that Mr. Drawbaugh spoke into it, (Ans. 31-33.)

Witness' testimony is corroborated by Jacob H. Kilmore (Id. p. 1037), Wm. H. Martin (Id. p. 827) and John A. Smith (Id. p. 1114).

WM. W. SNYDER (Id. pp. 1066-1082) was at Drawbaugh's shop on Wednesday, February 5, 1873, and saw the talking machines (Ans. 23-39). Witness verifies the date by an entry in his diary (Ans. 26).

Here, again, it is impossible that there could be any error as to the dates. Prominent citizens, such as Barber and Goodyear, identified the time absolutely by the public business which they were engaged upon and which called them to the shop. The Natcher family fix it by the fact that they never were in Milltown after they moved away on August 9, 1872. Others, such as Orris, S. S. Rupp, Hamme, Frederick, Fry, Fox, Martin, Keefauver, May and Snyder, fix it by book entries, or facts concerning the date of which there can be no question. And very many of the witnesses were never at the shop after the beginning of the year 1875.

Witnesses who heard of Drawbaugh's telephones.

One further class of witnesses remain to be considered in this connection.

A great many herein above cited as having talked through, or seen, Mr. Drawbaugh's talking machines prior to February 14, 1876, testify that they *heard of* said machines before they ever saw them. In addition to these, more than fifty other witnesses testify to having heard of Drawbaugh's talking machines prior to February 14, 1876.

Springer (D. Vol. 1, pp. 182–8, Ans. 59, 60), heard of them as early as 1875 or before; *Strong* (Id., p. 375), in November, 1875; *Hiler* (Id., p. 382), in 1869; *Byers*, a telegraph operator for the Western Union Telegraph Company, at Newville (Id., p. 509), about 1873 to 1875; *Geo. Bricker, Sr.* (Id., p. 510), in the fall of 1870; *Henry Snyder* (Id., p. 513), about 1872 or 1873; *Z. Bowman* (Id., p. 612), in 1871 or 1872, when Drawbaugh's child was a mere skeleton; *David Evans* (D.

S-reb., p. 52), *Ambrose Knaub* (Id., p. 38), *Elizabeth Evans* (Id., p. 75), *Moses Evans* (Id., p. 78), and *Mrs. E. Rentzel* (Id., p. 83), all about December 1, 1875; *Mrs. Mary A. Evans* (Id., p. 61), in 1872, before her father's death, which happened in February, 1873—she heard *her father* speak of it; *J. M. Brenneman* (Id., p. 114) in 1873, at Highspire; *M. H. Natcher* (Id., p. 135), one of the complainants' witnesses, prior to August 9, 1872; *William Natcher*, another of complainants' witnesses (Id., p. 149), prior to August 9, 1872, when he removed from Milltown with his family; *Miley* (Id., p. 170), in 1873–5; *Mrs. E. Natcher* (Id., p. 174), prior to August 9, 1872; *John Sprenkle* (Id., p. 281), prior to June 30, 1873—(for fixing the date, compare his answer, 12, with Gen. Diven's testimony, (Id. p. 77); *Crone* (Id., p. 338), from spring of 1874 to spring of 1875; *J. A. Sprenkle* (Id., p. 364), about 1871 or 1872; *L. J. Klein* (Id., p. 377), in December, 1871,—before the death of Henry Rupp; *S. H. Bates* (Id., p. 380), at Bridgeport, from 1869 all along to 1876; *E. Ditlow* (Id. p. 389), prior to his father's death on Feb. 21, 1873; *Danner* (Id. p. 402), before March, 1873, and frequently from March to November, 1873; *Blair* (Id. p. 410), all along from 1866 to 1876; *G. A. Spangler* (Id. p. 462), from 1868 to 1871; *Harris*, from April, 1874, to March, 1876; *Reed*, station agent of Pennsaylvania R. R. Co., at Wheeler, Indiana (Id. p. 476), in May or June, 1870, *at Wheeler, Indiana*, from Joseph Ditlow, and fixes date by his account books; *Mrs. I. Hardesty*, of Wheeler, Indiana (Id. p. 483), in Sept., 1874, at Wheeler; *Salome Hardesty* (Id. p. 489), in Sept., 1874, at Wheeler; *Harman Hardesty* (Id. p. 493), in September, 1874, at Wheeler; *Hamlin Hardesty* (Id. p. 509), in September, 1874, at Wheeler; *Mrs. Kate Young* (Id. p.

536), about 1870; *William Young*, husband of Kate (Id. p. 539), about 1871; *Mrs. Reynolds* (Id. 612), in summer of 1874, from Edward Nichols, while he was working at Drawbaugh's shop for the Haucks; *Chambers* (Id. p. 671), as early as August, 1874, at Newville; *Hackett* (Id. p. 690), from spring of 1874 to fall of 1874; *Mrs. L. H. Nichols* (Id. p. 731), in summer of 1874; *B. F. Zimmerman* (Id. p. 822), all along from 1868 to 1873; *Mrs. M. Swigert* (Id. p. 869), in 1874; *Magonell* (Id. p. 963), before November 3, 1873—about 1871; *Skeibley* (Id. p. 1020), in 1873 or 1874; *Egolf* (Id. p. 1023), in latter part of 1872; *J. H. Kilmore* (Id. p. 1037), in 1869—1870; *George S. Bricker* (Id. p. 1083), in September, 1869, and told the surveyors, Spafford and McHenry, who were appointed by Act of Legislature, commissioners to adjust the boundaries of Clinton county, Pa., a hundred and sixty miles distant from Milltown; *Spafford* (Id. p. 1089), one of said commissioners, who was never at Milltown, but heard of Drawbaugh's talking machine from Bricker in October, 1869, while adjusting the Clinton county line; *McHenry* (Id. p. 1092), the other commissioner who, also, was never at Milltown, but heard of Drawbaugh's talking machine at the same time with Spafford; *William North* (Id. p. 1102), prior to July 25, 1870; *S. A. North* (Id. p. 1105), prior to July 25, 1870; *Woods* (Id. p. 1107), in the fall of 1869; *Rev. J. H. Young* (Id., p. 1112), in 1875; *J. A. Smith* (Id., p. 1114), from the spring of 1872 all along to the spring of 1876; *Dale* (Id., p. 1119), at Carlisle, prior to 1875; *Gher* (Id., p. 321), from 1873 to 1875, "eight or ten years" prior to testifying; *George Martin* (Id., p. 307), in 1874; *Burgner* (Id., p. 1137), prior to April 1, 1869; and *G. W. Hunter* (Add Proofs, p. 172).

This latter class of witnesses serve to fix the dates of Drawbaugh's talking machines, often in the most striking and conclusive manner. Take, for example, the testimony of Spafford, McHenry and Bricker, who adjusted the Clinton county line; they were proceeding under an Act of the Pennsylvania Legislature, of April 3, 1869, printed on p. 1089, defendants' surrebutting record; and they filed their report of the completed adjustment in the Court of Common Pleas in Clinton County, on November 1, 1869, as appears by a certified copy of the record, printed on pp. 248, 249, defendants' evidence in surrejoinder. The knowledge of Mr. Drawbaugh's talking machine was communicated to the two commissioners and others when all were together engaged on that survey. They never saw each other after that survey was completed, until they met in Harrisburg to testify in this case. (Bricker, p. 1086, Ans. 19, 22; Spafford, p. 1090, Ans. 11; McHenry, p. 1093, Ans. 5, 8.) Spafford and McHenry got their information in 1869 from Bricker, who had gotten his information from Henry F. Drawbaugh, at Newville. (Bricker, p. 1083, Ans. 5; p. 1085, Ans. 13; Spafford, Ans. 13; McHenry, Ans. 9.) Spafford and McHenry are persons of high standing in the community, as appears from their being personally named in the Act of April 3, 1869, as commissioners for so important a work. They were evidently satisfactory to the people of both Clinton and Potter counties, as proper persons for the adjustment of disputed questions between the two counties.

Again, the witnesses from Wheeler, Indiana, fix their dates in the most conclusive manner from account books, railroad books, &c., &c. Reed, the railroad station agent there, testifies that all of them are persons of the highest standing in the community. (Reed, p. 482, Ans. 27, 28, 29.)

So, also, the Evans party, including Mr. Knaub and Mrs. Rentzel, cannot be mistaken as to their date. And the same remark is true of many of this class of witnesses, who heard of the talking machines at a time when they do not remember to have seen them, or who certainly did not see them. Persons who died long prior to February 14, 1876, are shown to have been talking through, or talking about Mr. Drawbaugh's telephones; as, for example, Michael S. Drawbaugh, who died March 16, 1871 (D. S-reb., p. 1098, Ans. 7, 8); Henry Rupp, who died in the latter part of January, 1872 (Id. p. 378, Ans. 4); Abraham Ditlow, senior, who died February 21, 1873 (Id. p. 61, Ans. 4); and George B. Heck, who died July 9, 1873 (Id. p. 893, Ans. 10).

Upon reviewing the whole of the evidence hereinabove commented upon, it appears that *two hundred and twenty persons testify to knowledge of Mr. Drawbaugh's speaking telephone prior to February 14, 1876!* Of these *one hundred and forty-one actually saw the instruments,* and the majority of them identify the particular machines which they saw; and *about seventy heard talk through the machines or were present when others were successfully talking through them.* The great majority of these witnesses testify to facts occurring prior to June 2, 1875, and therefore anticipating Bell's first alleged telephone experiments.

When we come to consider the history of Drawbaugh's telephones subsequently to February 14, 1876, it will be seen that the above evidence is corroborated by a strong array of additional testimony. It will be shown that, about that date, and from time to time thereafter, down to 1879, new telephones appeared in Mr. Drawbaugh's shop, of greatly improved form and construction, far in advance of all improvements made by other inventors. And even the complainants will be compelled to contribute a portion of the corroborating evidence.

Drawbaugh's Telephones were Electric Machines.

That Mr. Drawbaugh's talking machines, in existence and successful working operation prior to Alexander Graham Bell's invention, were *electric* instruments, has already been shown; but the evidence on that point has by no means been exhausted. It may be briefly condensed as follows:

1. Three of the instruments, "A," "D" and "E," are still in existence, to speak for themselves. Of four others, "I," "C," "F" and "B," such original parts are still extant as to show conclusively their electric character and their general plan and mode of operation.

2. The testimony of Daniel Drawbaugh is positive and explicit, that they were electric speaking telephones, always used with a closed circuit, and without breaking the current—some of them being battery-telephones, and some magneto-telephones.

3. The distances to which Drawbaugh was in the habit of asserting the power of his instruments to talk, and his repeated statements that the invention would supersede the telegraph, show conclusively that electricity was the medium of operation. Among his many statements on this subject, before the date of Bell's invention, were the following:—

"It was the greatest invention ever known,"—"if he had the means to go on with it, he said they could talk, or rather be a time to come as to talk, to the old country same as we can talk here." (*Shank*, D. Vol. 1, pp. 23-4, Ans. 45.) "He could run it out for miles, and parties could talk in at one end and be heard at the other end, the same as persons in a room together;" "It would eventually take the place of telegraphs" (*Zacharias*, Id. pp. 49-50, Ans. 28, 29). "It would supply the place of the telegraph." "He gave me as an illustration the distance between Harrisburg and Philadelphia—that parties at that distance could communicate as if they were speaking together;" "there would hardly be any limits;" it was "an instrument to convey the voice to supply the place of the telegraph." (*Smith*, Id. p. 68, Ans. 16). "From here to California" (*Smyser*, Id. p. 76, Ans. 22). "It would do away with a great deal of telegraphing" (*Waggoner*, Id. pp. 123-4, Ans. 21). Can talk "as far as the wire goes" (*Fry*, Id. p. 145, Ans. 18). "Said he could hear a man talking from that place to New Cumberland or Harrisburg, and understand distinctly what he said" (*Carl*, Id. p. 159, Ans. 14). "Better and handier than the telegraph—that you could just talk through it in place of writing" (*Sherich*, Id. p. 177, Ans. 9). "He says, by attaching two wires, you can hear it away off: the telegraph is nowhere with it" (*Balsley*, Id. p. 193, Ans. 15). "He said he could be heard a great many miles, but the miles I disremember" (*E. Z. Good*, Id. p. 200, Ans. 32). "He told me he could talk the same for miles as he could for a short distance" (*Kahney*, Id. p. 204, Ans. 42). "He said, at the same time if he had a wire from the shop in connection with the telegraph wires at White Hill, that he could talk to Mechanicsburg, by having a machine there, or an instrument in the office; he also said that it would be better than telegraphing, and that it would be worth a great deal of money" (*Shettel*, Id. p. 206, Ans. 4). "He thought he could make it that he could talk through it to Harrisburg;" "He thought they would take the place of telegraphing" (*Renéker*, Id. p. 239; Ans. 48, 49). "Beats all the others of my inventions:" "he said he could carry sound as far as Shiremanstown, or rather talk as far as Shiremanstown" (*Weber*, Id. p. 245, Ans. 5½, 247, Ans. 25). "Convey the voice or sound to a great distance" (*Shireman*, Id. p. 260, Ans. 14). "He said that he would be able to operate, that a man preaching in New York, that a congregation in Philadelphia would hear the same sermon" (*Hawn*. Id. p. 267-8, Ans. 18). "He said it could be made that you could talk to New York" (*Darr*, Id. p. 273, Ans. 22). "He said he could just as easy speak ten miles as one, or any distance he would choose to" (*Kahney*, Id. p. 276, Ans. 19). "He said the time would come that you could speak to San Francisco." "He thought the talking machine would take the place of the telegraph" (*Hamacher*, Id. p. 290, Ans. 17). "He said it was worked by electricity; would take the place of the telegraph, and that he could make it so that he could talk to San Francisco." (*J. F. Rupp*, who was there with Hamacher, Id., p. 314, Ans. 48.) "He told me he was going to make a machine to talk from Harrisburg to Philadelphia, and he said it would be a cheaper and quicker way than telegraphing." (*Musser*, Id., p. 316, Ans. 17.) "Said he believed they could talk for a hundred miles." (*Smith*, Id., p. 337-8, Ans. 42.) "He said I could speak ten, fifteen or twenty miles, or even to California if there was a wire extended." (*Fetrow*, Id., p. 349-50, Ans. 23.) "He said he could stand here at White Hill and talk to his brother, the 'Squire, at Mechanicsburg, quite handily." (*Hiler*, Id., p. 382-3, Ans. 17.) "He said he could attach a wire to it and talk for ten miles"—"as far as he could have a circuit around." (*Wisler*, Id., p. 394, Ans. 17.) "He said he could talk across the continent." (*H. F. Drawbaugh*, Id., p. 406, Ans. 71.) "He said it could be heard hundreds of miles"—"would supersede the telegraph." (*Zimmerman*, Id., p. 416, Ans., 19, 21.) "He said, as far as wire could be magnetized"—"that there was no limit to the distance to which it could be done—that you could send it as far as you could put wires." (*Holsinger*, Id., p. 365, Ans. 47, 48.) "He said they could be used the same as a telegraph wire for a distance." (*Bates*, Id., p. 420, Ans. 14.) "It would take the place of telegraphing. I laughed at him at the idea of that, and he said, 'Rupp, you will see that it will.'" (*D. Rupp*, Id., p. 430, Ans., 34.) "Would do away with telegraphing." (*Hale*, Id., p. 473-4, Ans. 9.) "Mr. Drawbaugh said that the talking machine could be used to talk at a long distance—'from Philadelphia to California' are the very words that he used." (*Free*, Id., p. 489, Cross-Ans. 44.) "He spoke as if it could be used a thousand miles"—"it would take the place of the telegraph"—"he said that he had tested it and that he could hear distinctly—the distance of the length of Mechanicsburg was the distance he gave—just as distinctly as though a person was talking in a room." (*Landis*, Id., 631-2, Ans. 5, 7, 4.) "You could hear it to Pittsburg." (*Grove*, Id., p. 662, Ans. 1.) "That now he has invented something that would take the place of the telegraph." (*Herr*, D. Vol. 2, p. 668, Ans. 5.) "He told us then that he could talk hundreds of miles through that." (*Lenig*, D. Vol. 2, p. 699, Ans. 3). "Instead of using the old mode of telegraphing, he could talk directly through the wire"—"he thought he could talk as far as you could use the ordinary telegraph wire." (*Updegraff*, D. Vol. 2, p. 1082–3, Ans. 4; p. 1087, Ans. 35). "It was intended to convey sound from Philadelphia to New York or Baltimore, or quite a long distance." (*Smith*, D. Vol. 2, p. 1094–5, Ans. 3). "He said he thought it was, or would be, one of the greatest inventions of the age; and would take the place of telegraphing." (*Draper*, D. Vol. 2, p. 1126, Ans. 15). "He said, 'I can take this machine and talk clean out to Europe across the ocean.'" (*A. Evans*, D. S-reb. p. 8, Ans. 69; *Mrs. Erb*, Id. p. 50, Ans. 34; *D. Evans*, Id. p. 54, Ans. 22; *S. E. Evans*, Id. p. 57, Ans. 29; *M. A. Evans*, Id. p. 65, Ans. 45; *E. Evans*, Id. p. 77, Ans. 17; *M. Evans*, Id. p. 82, Ans. 26; *E. Rentzel*, Id. p. 84, Ans. 18; *Jacob Evans*, Id. p. 90, Ans. 23). "He believed he could talk to people in New York City, and even further." (*Zearing*, D. S-reb. p. 127, Ans. 41). "If he could only get some one to help him, once, he would run it to Harrisburg and convince them, and then he would run it from Harrisburg to Philadelphia." (*Eicholz*, D. S-reb. p. 154, Ans. 18). "He said it would take the place of the telegraph." (*Graybill*, D. S-reb. p. 187, Ans. 23). "He said it was for the purpose of talking between distant points, as, for example, between Eberly's Mills and Harrisburg, which, I think, he used as an illustration." (*Schrader*, D. S-reb. p. 471, Ans. 13). "He made the remark that he could converse as far as Carlisle"—"it was intended to surpass the present telegraph system." (*W. W. Snyder*, D. S-reb. p. 1073, Ans. 34).

4. Mr. Drawbaugh always explained his talking machines as operating by electricity. "He said it works by

electricity." (*Shank*, D. Vol. I, p. 24, Ans. 46). "Operated by electricity—he told me." (*Brooks*, Id. p. 42, Ans. 8). "I was under no other impression than that it was by electricity." (*Smith*, Id., p. 68, Ans. 18.) He told me "it was operated by electricity." (*Smyser*, Id., p. 76, Ans. 21.) He explains "that the sound was conducted by electricity." (*Nichols*, Id., p. 91, Ans. 22.) He said the instruments were "to convey sound by electricity." (*C. Eberly*, Id., p. 114-5, Ans. 16.) "He would operate it by electricity." (*Yetter*, Id., p. 137, Ans. 21.) *Condry* thinks he said they were operated by electricity. (Id., p. 139, Ans. 11.) *Stephen* says Drawbaugh explained them as operating by electricity. (Id., p. 249, Ans. 9.) "I was told it operated by a battery and electricity." (*Shoop*, Id., p. 256, Ans. 7.) "He said they operated by magnetism." (*Shireman*, Id., p. 260, Ans. 12.) "He said they would be operated on by a battery." (*Hawn*, Id., p. 267, Ans. 17.) "He said that the machine was operated by electricity—by a battery." (*N. W. Kahney*, Id., p. 277, Ans., 27.) "He said they were to convey words by means of electricity." (*Hamacher*, Id., p, 290, Ans. 16.) "It was worked by electricity." (*Rupp*, Id., p. 330, Ans. 61.) "He told me it would go by electricity." (*Musser*, Id., p. 316, Ans. 18.) "He told me that it was done by means of electricity." *Millard*, Id., p. 330, Ans. 60.) They talked on "*a circuit*." (*Wisler*, Id., p. 394, Ans. 17.) "He said it was electricity that would pass it over the wires—that it would carry the sound right along." (*Zimmerman*, Id., p. 416, Ans. 20.) He said they were operated "by electricity." (*Bates*, Id., p. 420, Ans. 13.) "It was driven by a magnet." (*Hale*, Id., p. 476, Cross-Ans. 30.) "My recollection is distinct as to its conveying sounds by electricity." (*Bricker*, Id., p. 510–1, Ans. 1.) Drawbaugh said they were operated "by electricity." (*Kohler*, Id., p. 545, Ans. 22.) "The sound could be carried to a distance on a wire by the use of electricity." (*H. K. Drawbaugh*, Id., p. 550, Ans. 3.) "By electricity or something of that kind." (*Taylor*, Id., p. 634, Ans. 9.) He said it operated "by electricity." (*Fisher*, D. Vol. 2, p. 689, Ans. 9.) "He said it was by electricity." (*Mrs. Free*, D. Vol. 2, p. 695, Ans. 14.) He told us of the use of electricity in connection with it. (*Lenig*, D. Vol. 2, p. 699, Ans. 2). The talking machines were operated by electricity (*Updegraff*, D. Vol. 2, p. 1088, Ans. 40). Drawbaugh told me at the time that the talking machine was operated by electricity (*Sutton*, Id. p. 1106, Ans. 21). "He could talk by electricity" (*R. B. Sutton*, Id., p. 1108, Ans. 9). He explained that they were operated by electricity (*Draper*, Id., p. 1128, Ans. 28). "He said it was worked by electricity" (*A. Evans*, D. S–reb., p. 8, Ans. 70). In connection with the talking machine, Drawbaugh "spoke of applying both magnetism and electricity." (*Prof. Heiges*, D. S–reb., p. 100, Ans. 39.) "He said 'This is done by electricity.'" (*Hamme*, Id., p. 324 Ans. 24.) "As far as I can remember, they said you could talk through it from one house to another—I don't just know how, but some way by electricity." (*Mrs. Swigert*, Id., p. 870, Ans. 7.) "He said it was to operate by electricity." (*Fox*, Id., p. 344, Ans. 18.) "He then told me of his talking machine, which he said was also done by electricity, over wires." (*Goodyear*, Id., p. 1016, Ans. 14.) "Electric talking machine, as he called it." (*William North*, Id., p. 1103, Ans. 5.) "He got to talking about an electric clock, and about a talking machine that would work by electricity." (*S. A. North*, Id., p. 1106, Ans. 14.) "It was to be an electric machine, used in place of telegraphing." (*Woods*, Id., p. 1108, Ans. 1215.) "I remember distinctly of hearing of an electric clock and an electric talking machine which he had invented." (*Young*, Id., 1113, Ans. 11.)

All the witnesses in the Overland case who testified to the Drawbaugh instruments tell the same story as to their electrical character. *Strickler* (Add. Proofs, p. 233) testifies (Ans. 29) even to the way in which the current was generated "in this instance," *i. e.* by magneto-electric, or inductive, action, implying that, in other instances, the other form of current (voltaic) was used. See also testimony of Mr. and Mrs. Haldeman, Marquart, Longnecker, the Stevensons, the Gregorys, Woodburn, Orris, Emrick, Boyle and his corroborating witnesses, etc., etc.

5. Witnesses all along, from 1867 to February 14, 1876, in addition to identifying the very talking machines, which they saw or operated, testify that they saw various electrical appliances connected with them, such as batteries, permanent magnets, electro-magnets, armatures, wrapped wires, circuit wires, wires hanging loose, binding-posts, "two wires," high and low conductors, insulated wire. In D. Vol. 1——

Shank testifies (p. 21) that they were connected by two wrapped wires (Ans. 17-20; also p. 22, Ans. 34, 35). *Brooks*, p. 42, says the same (Ans. 14). *Zacharias* corroborates the same fact (p. 49, Ans. 21). *Smyser* (Ans. 14, 15) testifies to the same. *U. R. Nichols* (p. 91, Ans. 25, 26) says Drawbaugh connected the two wires to the binding-post of the instrument "A" in witness' presence in order to talk through it. *J. B. Fry* (p. 100, Ans. 33-36) says they were connected by two wires. *Carl* says they were connected by wrapped wire (p. 159, Ans. 10).

J. E. Smith (p. 167, Ans. 24) testifies that wrapped wires were used to connect the instruments. *Balsley* (p. 193, Ans. 15) corroborates the same fact. So, also, *Kahney*, (p. 204, Ans. 44.) *Shettel* (pp. 206–7, Ans. 4, 5) testifies to the two wires, the electro-magnets, the armature—"bar of iron that was attached to the bladder"—batteries, &c., &c., and describes the size and arrangement of the parts. *S. Nichols* testifies to the two wires and other electrical appliances used on the machines (p. 229, Ans. 17–21, &c.) *Weber* (p. 245–6, Ans. 7) says it was wire wrapped like an old-fashioned bonnet wire. *Stephen* (p. 249, Ans. 9–13) saw coils and batteries attached to them. *Shireman* (pp. 261–2, Ans. 32, 33) saw the wrapped wire extending along the ceiling, &c., and connecting the instruments; and the coils of white wrapped wire—which white covering was probably the same that Drawbaugh procured from Fox at the Harrisburg cotton mill in 1870 or 1871, as testified to by Fox, (D. S–reb., pp. 344–45, Ans. 18–27.) *Musser* (D. Vol. 1, pp. 316–7, Ans. 19) states that Drawbaugh told him about the high and low conductors, and tried to explain them to him. *J. C. Smith* (Id. pp. 336–7, Ans. 26, 27, 41, &c.) saw the two copper wires connecting the instruments, and running along the ceiling and down through the floors, and was told about the high and low conductors, non-conductors, &c. *Holsinger*, (pp. 366–7, Ans. 56–58), who was never at Drawbaugh's shop after November 27, 1876, saw Drawbaugh preparing hard carbon compositions to be used in his talking machines, and remembers the fact of his discussing or explaining the different ways of using the conductors. He also remembers the armature—a little sheet of soft iron—attached to the vibrating substance or diaphragm. *Zimmerman* (Id., p. 416, Ans.

22) remembers that Drawbaugh explained the construction of the electro-magnets and the necessity of insulating their wires. *D. Rupp* (Id. p. 428, Ans. 15, 16), speaks of the wires connecting the instruments, the curled magnets, the magnet on instrument C, the battery—tumblers under the table. *Geistweit* (pp. 459-60, Ans. 15, 20) describes how the wires, wrapped with colored thread, ran from place to place in the shop, connecting the instruments. *Bowman* (pp. 467-8, Ans. 22-24) describes the wires connecting the instruments—how they ran—the batteries, etc. *Hale* (p. 474, Ans. 10-18, first deposition, and p. 665-6, Ans. 1-3, second deposition), testifies to the electro-magnet and permanent magnet on "C," the electro-magnet of "B," the copper wires, the size of the magnets, the color of the insulating material, etc., etc. *Free* (p. 486, Ans. 20-25) testifies to two wires and a battery being used with the machines. *Kohler* (pp. 545-6, Ans. 23-26) saw the wires and battery connected to the talking machine.

Hon. R. J. Haldeman saw the wrapped wires in 1868, extending out of the window to some station outside—"the string, I believe, enveloped a metallic wire." (Add. Proofs, p. 104, Ans. 16.) *Mrs. Haldeman* (Id. p. 107) testifies to their electric character. So, also, all the other Overland witnesses.

In the People's case:—

H. K. Drawbaugh (pp. 550-71) testifies very fully to the electrical character of these machines, including the use of two wires, long lines of wire stretched back and forth in the attic and connected to the instruments, experiments with plumbago and other low conductors, electro-magnets, permanent magnets, armatures, batteries, etc., etc. (See Ans. 6, 9, 21, 23, 31, 77-79, 82-100, 105, 131.) *Herr* (D. Vol. 2, p. 669, Ans. 14, 15) saw the slack wires connected to the talking machines and running out of the shop; also (Ans. 16) the permanent magnet on "C." *Updegraff* (Id. p. 1082, Ans. 4) saw the wire running out of the shop from the talking machines; the peculiar-shaped magnets (Id); the helix, and other magnets (Ans. 24, 25); the machines were changed around during the talking—"he took them off the wires—detached them and put on others" (Cross-Ans. 83). *Smith* (Id. pp. 1095-6, Ans. 4-10) describes various electrical parts belonging to the machines, such as magnets, spools, etc., etc. *Sutton* (p. 1105-6, Ans. 16, 17) refers to the magnets, electro-magnets, batteries, etc., which he saw belonging to the talking machines.

SCHRADER (D. S.-reb., p. 470, Ans. 15, 17) describes the armature of "B," the size of the electro-magnets, etc. *Vannasdale* (Id., p. 792, Ans. 31) describes the arrangement of the permanent magnet right up against the electro-magnet, on C, when he saw it February 3, 1875. Other witnesses refer to various electrical parts of the machines identified by them, and testify that such parts were on the machines when they saw them, from time to time, at Drawbaugh's shop, long prior to Bell's invention; but we do not deem it worth while to fill up the brief with references to such testimony, as the facts are, in effect, included in their recognition and identification of the instruments themselves. *We would, however, in this connection, call especial attention to the fact that all Mr. Drawbaugh's volunteer assistants, through all these years—Harman K. Drawbaugh, George W. Drawbaugh, Henry F. Drawbaugh, Holsinger, Springer, John C. Smith and Emanuel K. Gregory*—testify unanimously to the electrical character of the work.

It is therefore conclusively established, so far as human testimony can establish any fact, that, on the morning of June 2, 1875, Alexander Graham Bell and Daniel Drawbaugh stood relatively as follows: Mr. Bell had discovered nothing and invented nothing; he was ignorant even of the fact that the mechanical vibration of an armature in front of the pole of an electro-magnet would cause any audible effects at the other end of the line. He was not an electrician, and was groping for general information as to the character and effects of the electric current under different conditions; he suspected the possibility of electrically transmitting speech, but had no idea of the means for accomplishing it.

At that same moment Mr. Drawbaugh had in his shop at Milltown, at least seven electric telephone instruments—transmitters and receivers, battery and magneto telephones—through some of which he had been successfully transmitting speech for years, and all of which were open to the inspection and trial of any person who chose to visit his shop. If Mr. Bell had visited Drawbaugh's shop that day, he could have held a conversation back and forth over an electric speaking telephone line, as perfectly and as easily as to-day. And these facts, so far as Drawbaugh's telephones are concerned, were known at that time to whole communities—not to a few interested persons, but to hundreds of witnesses, scattered over a wide territory, and some of them living in distant counties and even in different states.

And that these prior telephones of Drawbaugh contained all the inventions claimed in the two patents set up by the complainants in this suit, is equally well established.

1. The machines are here in court to speak for themselves.

2. The defendants' experts, Mr. Park Benjamin and Prof. Barker, testify to their complete anticipation of both of the Bell patents.

3. The fact of their ability to transmit and reproduce articulate speech audibly, is of itself, on the complainants' own theory and according to all their expert testimony, including that of Mr. Bell, himself, conclusive evidence of their anticipating his inventions.

4. The complainants' expert, Mr. Pope, agrees with Mr. Park Benjamin as to their anticipating the inventions claimed in the Bell patents. His testimony is so unhesitating and positive, that we here append a portion of it, (C. Vol. 2, pp. 1419–1422) as follows:

"Cross-Q. 267. What mechanical part essential to a telephone receiver, do you find in Bell's instrument illustrated in Fig. 7 of his patent of March 7, 1876, that you do not find in Drawbaugh's instrument, 'Reproduced B?'

"Ans. Nothing; I regard the two receivers as substantially alike.

"Cross-Q. 268. What mechanical part essential to a telephone transmitter do you find illustrated in Fig. 7 of Bell's said patent that you do not find in Drawbaugh's instrument 'Reproduced B?'

"Ans. No essential part, but in answering this I assume that a source of electricity must be used in connection with each to constitute it a transmitter. The instruments themselves are substantially the same.

"Cross-Q. 269. A continuous electric circuit, including a battery and two of Drawbaugh's 'Reproduced B' instruments would present substantially the same contrivance and arrangement as is shown in Fig. 7, of Bell's patent of March 7, 1876; would it not?

"Ans. It would.

"Cross-Q. 270. What mechanical part essential to a telephone transmitter or a telephone receiver, do you find represented in Fig. 7 of Bell's said patent that is not contained in Drawbaugh's reproduced instruments 'C and I?'

"Ans. Assuming 'C' and 'I' to be coupled together in a continuous circuit, there appears to be nothing essential contained in Fig. 7 of the patent that is not fouud substantially in instruments 'C reproduced' and 'I reproduced.'

"Cross-Q. 271. Answer the same question, assuming a continuous circuit with Drawbaugh's instrument 'C reproduced' and his instrument 'A' in the line.-

"Ans. I make the same reply to this question, with the understanding that a battery is placed in the continuous circuit with the Drawbaugh instruments.

"Cross-Q. 272. Answer the same question, assuming a continuous circuit with a battery and with Drawbaugh's instrument 'I reproduced' and his instrument 'A' in the line.

"Ans. The same answer is also applicable to this couple.

"Cross-Q. 273. Answer the same question, with Drawbaugh's instrument 'B reproduced' and his instrument 'F' in a continuous circuit with a battery.

"Ans. The same answer is also applicable to this couple.

"Cross-Q. 274. Answer the same question, with Drawbaugh's instrument 'B reproduced' and his instrument 'D' in a continuous circuit with a battery.

"Ans. Assuming 'D' to be in a working condition, which it was not when I saw it, I again repeat the answer with reference to this couple.

"Cross-Q. 275. Answer the same question, with Drawbaugh's instrument 'C reproduced' and his instrument 'E,' in a continuous circuit with a battery.

"Ans. I again repeat the same as to this couple.

"Cross-Q. 276. Answer the same question, assuming Drawbaugh's instrument 'I reproduced' and his instrument 'E' in a continuous circuit with a battery?

"Ans. I repeat the same answer as to this couple.

"Cross-Q. 277. Answer the same question, assuming Drawbaugh's instrument 'C reproduced' and his instrument 'D' in a continuous circuit with a battery?

"Ans. I repeat the same answer, on the assumption, as before, that 'D' is in working order.

"Cross-Q. 278. Answer the same question, assuming

Drawbaugh's instrument 'I reproduced' and his instrument 'D' in a continuous circuit with a battery?

"Ans. I repeat my answer, which is the same as to the preceding question.

"Cross-Q. 279. Answer the same question, assuming Drawbaugh's instruments 'D' and 'E' in a continuous circuit with a battery?

"Ans. My answer is the same as to question 277."

(Recess until 3 P. M.)

"Cross-Q. 280. Answer the same question, assuming a continuous circuit with a battery with Drawbaugh's instruments 'A' and 'reproduced B' in line?

"Ans. I find no mechanical part essential to a telephone transmitter or telephone receiver represented in Fig. 7 of Bell's patent that is not contained in the instruments referred to in question, assuming, as before, that they are placed in a continuous circuit with a battery.

"Cross-Q. 281. Answer the same question, assuming Drawbaugh's 'reproduced B' and 'reproduced C,' in a continuous circuit with a battery?

"Ans. I repeat my last answer as to this couple.

"Cross-Q. 282. Answer the same question, assuming Drawbaugh's 'reproduced B' and 'reproduced I' in a continuous circuit with a battery?

"Ans. I repeat my answer to question 280 as to this couple.

"Cross-Q. 283. Answer the same question, assuming a couple of Drawbaugh's instruments 'reproduced C,' in a continuous circuit with a battery?

"Ans. I repeat my answer to question 280 as to this couple.

"Cross-Q. 284. Answer the same question, assuming a couple of Drawbaugh's instruments 'reproduced I,' in a continuous circuit with a battery?

"Ans. I repeat my answer to question 280 as to this couple.

"Cross-Q. 285. Answer the same question, assuming a couple of Drawbaugh's instruments 'E,' in a continuous circuit with a battery?

"Ans. I repeat my answer to question 280 as to this couple.

"Cross-Q. 286. Answer the same question, assuming Drawbaugh's instruments 'A' and 'E,' in a continuous circuit with a battery?

"Ans. I repeat my answer to question 280 as to this couple.

"Cross-Q. 287. Answer the same question, assuming Drawbaugh's instruments 'A' and 'D,' in a continuous circuit with a battery.

"Ans. I repeat my answer to question 280, as to this couple, assuming 'D' to be in its original uninjured condition.

"Cross-Q. 288. Answer the same question, assuming a couple of Drawbaugh's instruments 'D' in a continous circuit with a battery?

"Ans. I repeat my answer to question 280, as to this couple, assuming 'D' to be in its original uninjured condition.

"Cross-Q. 289. In a speaking telephone line, it is not necessary to have a battery in the line, provided the electromagnet of the transmitting instrument is polarized by a permanent magnet, is it?

"Ans. It is difficult to get any results without a battery, unless the transmitting and receiving instruments are both polarized. The results are, at least, very inferior, and I should rather say that the battery is necessary, unless both magnets are polarized.

"Cross-Q. 290. In Drawbaugh's instruments 'D,' 'E,' 'Reproduced C' and 'Reproduced I,' the electro-magnets are polarized by a permanent magnet, are they not?

"Ans. They are.

"Cross-Q. 291. Suppose we should couple those instruments together in a continuous circuit without a battery in any of the following couplets, to wit: C and D; C and E; C and I; D and E; D and I; E and I; or should use a pair of the same instruments as C and C; D and D; E and E; or I and I; what part essential to a speaking telephone transmitter or receiver do you find represented in Fig. 7 of Bell's patent of March 7, 1876, that you would not find contained in each of said couplets?

"Ans. Every part essential to a speaking telephone transmitter or receiver, which is represented in Fig. 7, of the patent, is represented by a corresponding part in each of the couples enumerated in the question. The construction is not precisely the same, nor are the proportions similar in many cases. And the source of electricity, which in the patent is a battery, is replaced by a permanent magnet in each of the couples."

PART II.

SUBSEQUENT TO FEB. 14, 1876.

The history of Mr. Drawbaugh's operations and achievements prior to Feb. 14, 1876, is strongly corroborated by evidence covering the period from Feb. 14, 1876, to the beginning of this suit, and which we will now very briefly review. From this additional evidence two important facts clearly appear, to wit:—*first*, that the same instruments which we have shown to have been in existence at his shop prior to the year 1876, continued to be seen there from that time to the present; and, *secondly*, that new and very highly organized and improved telephone instruments made their appearance there from time to time, 1876, and from that year to the present.

And, *first*, as to the old machines being seen there in 1876 and subsequent years:—*J. Fry* saw talking machines there in 1876, (D. Vol. 1, p. 145, Ans. 23). *Springer* lived at Milltown from April 1, 1876, to January 7, 1877 (Id. p. 182, Ans. 3), and never has been in Drawbaugh's shop since he moved away (p. 188, Ans. 61). While there he saw "B," "F," "D," "E," (Ans. 7), "C" (Ans. 30) and other new machines. *Reneker*, (Id. p. 237, Cross-Ans. 44) testifies that he saw "B" and "F" there every year since 1875. *Stephens*, (Id. p. 250, Ans. 16) is "certain" that he saw "C" there in 1876. He is corroborated by complainants' witness, *George Row* (C. Vol. 2, p. 1533), who testifies to Stephens' telling him about Drawbaugh's talking machines immediately after returning from the shop in October, 1876. *N. W. Kahney*, (D. Vol. 1, pp. 277–8, Ans. 32–48) testifies to seeing and talking through "A" as a receiver, in 1876. *H. B. Musser*, (Id. pp. 317–8, Ans. 20–34) talked through "D" on June 28, 1876. His date is corroborated by the books of the Axle Co. (see Moore, Id. p. 623, Ans. 33). *Henry F. Drawbaugh* (Id. p. 407, Ans. 77, 79) saw and talked through "D" before commencing to run the cars. He began running the cars in May, 1876 (p. 398, Ans. 19). *W. S. Dellinger* (Id. p. 440, Ans. 13) saw "E" and "B" in March, 1876, also saw "A" and "C," but cannot fix the time. *Geistweit* (Id. p. 460, Ans. 24, 25) was never at Drawbaugh's shop after the fall of 1876; saw "D" or "E," or both, there prior to that time. (Ans. 26.) *George H. Bowman* (Id. p. 466) saw and talked through machines there in February, 1876 (Ans. 4, 5, 6, &c.), but does not identify the instruments. Witness never was there again before the commencement of this suit. (Ans. 26.) Harman K. Drawbaugh saw "F" there in the fall and winter of 1876 (Id. p. 569, Ans. 150). *D. B. Musser* (p. 608, Ans. 8–14) saw "D" there in 1876, in the summer. *Wilson N. Miller* testifies that he was employed at the warehouse at White Hill railroad station from January, 1876, to June, 1876 (Ans. 14–16, Id. p. 644), and was railroad station agent there from June, 1876, to April, 1878 (p. 644, Ans. 13). Drawbaugh was living at Mechanicsburg from April 1, 1876, to April 1, 1877, and had to take the cars at White Hill station to go from his shop to his home. One *evening* (Ans. 20) in the *summer*

(Ans. 30) as Drawbaugh was about to take the train while living at Mechanicsburg (Ans. 20)—and hence in the summer of 1876—Drawbaugh had a talking machine with him and showed it to the witness (Ans. 20) and wanted witness to put up a line and equip it with the talking machines, for use from witness' railroad office to the store of witness' father at Shiremanstown, in and about the business of witness and his father. (Ans. 22–30.) Witness neglected the matter, but kept Drawbaugh under the impression that he would try to make the necessary arrangements for putting up the line; and Drawbaugh spoke to him several times about it (Ans. 26), and probably saw, after awhile, that witness did not mean to do anything about it. Witness describes the instrument which Drawbaugh showed him, at that time, as *a small wooden box about five or six inches across and about an inch and a half thick*, with a tube to it (mouthpiece) to talk in, *which clearly identifies the instrument as Exhibit "A."* *Jeffries* (D. Vol. 2, pp. 679–684), was at Drawbaugh's shop, by invitation about a week after the presidential election of November, 1876 (Ans. 5), and again after that and before Christmas, 1876 (Ans. 12, 13, 14). On his first visit there he saw talking machines (Ans. 6–11) which he identifies as "C," "B," "F," "A," "H," and small round instruments like "D" and "E" having wrapped wire connected with them (Ans. 21, 22, 29). The instruments then looked as if they had been made some time; "B," "C" and "F" looked old and worn with handling. (Ans. 31, 30.) *Uhrich* (D. S.-reb. p. 219, 220), was at the shop about 1876 (Ans. 2) and never was there before or after (Ans. 7); while there he saw the talking machine instruments similar to "M" and "D" (Ans. 8–11); *Dunlap* (Id. pp. 581–583), was at Drawbaugh's shop in August, 1876 (Ans. 6, 7), and was never there but that once (Ans. 5). While there he saw instruments "H" and "B." (Ans. 30). His date is positively fixed by *Chambers* (Id. pp. 671–679). *D. Cowan* (Id. pp. 701–704), was at the shop with Kissinger in the spring of 1876, before the Centennial and saw and talked through the talking-machines, but does not identify the particular instruments. He never was in the shop before nor since. (Ans. 38–59.) Complainants' witnessess, *Shapley* (C. Vol. 1, pp. 589, 599, Ans. 22–30), and *Landis* (Id. pp. 607–609, Ans. 13, 23, 28, 31), saw "B" at Drawbaugh's shop on October 3, 1876. Drawbaugh said it "was to revolutionize the world, or words to that effect" (Landis, p. 609, Ans. 28). *Drawbaugh said he had had it up around the shop* (Shapley, Ans. 26) *and they had spoken with it.* (Ans. 28.) Complainants tried to make it appear that Shapley had shown Drawbaugh a *Scientific American* containing a description of a telephone (Shapley, Question 79) but on cross-examination (Ans. 118–127), it was admitted by Shapley that he showed this article to Drawbaugh *after October 3, 1876*, and hence, after seeing Drawbaugh's telephone, Michael Dellinger (D. Vol. 1, p. 538) was at Drawbaugh's shop in November, 1877 (Ans. 1, 2), and never there before or since (Ans. 11). While there he saw "A," "D," "H," and other machines not identified. (Ans. 4–10.) *Henry Dellinger* (Id., 539–41) was there in the fore part of June, 1877 (Ans. 7–11), and was never there after 1877 (Ans. 18). While there he saw "F," "B," and many other talking machines. (Ans. 12–17.) *John Dellinger* (Id., pp. 542–3) was there with his brother Henry in June, 1877 (Ans. 1–5), and saw "B," "M," "H," and other talking machines (Ans. 7–30). Witness was never there after that visit (Ans. 13). *H. N. Shoop* (Id., pp. 255–9) moved to Milltown in February, 1877, and moved away in November, 1877 (Ans. 12) and never was in Mr. Drawbaugh's shop since. (Ans. 25.) While living there saw "D" at the shop (Ans. 16, 47). *Matthias* (Id., pp. 547–9) was first at the shop in 1877, toward fall (Ans. 4) and saw and talked through the talking machines (Ans. 5), among which he identified "E" and others. (Ans. 10–46). Was there again in 1878, and saw talking machines. (Ans. 14, 15.) *Kimmel* (D. S.-reb., p. 180) saw talking machines there in 1876 or 1877, which he does not identify. (Ans. 6–11.) *Augustus Kahney* (Id., pp. 254–266) was there in 1877 (Cross-Ans. 56) and saw talking machines there (Ans. 5–29). *F. F. Landis*, Master Mechanic of the Geiser Mfg. Co., of Waynesboro, Pa., was there in November, 1878; and saw talking machines "D" and "H." (Ans. 15–25.) *J. Fry* (D. Vol. 1, p. 145, Ans. 25) saw talking machines there in 1878. *William S. Dellinger* (Id., pp. 439–57) saw them all along from March, 1876, to 1881. *Levi A. Bowen* saw "D" and "E" there in Sept., 1878. (D. Vol. 1, p. 462–3. Ans. 3–5). Drawbaugh said he had others (Ans. 10, 16), but witness did not see them (Ans. 9). *Fry* (Id., p. 145, Ans. 26) saw them there in 1879. *Chellis* (Id., p. 528, Ans. 24) saw "B," "F," "A," "D," "E," "C," "I," and others there in the latter part of 1878 and early part of 1879. Witnesses who were often at the shop from 1875 to 1880, such as Shettel, Dr. Moffitt, George W. Drawbaugh, Henry F. Drawbaugh, Harman K. Drawbaugh, W. S. Dellinger, Daniel Fettrow, and many others, say that along during that time, they saw many different talking machines there, the precise dates of which they are unable to identify. Many of the complainants' witnesses, in addition to Shapley, I. D. Landis and Row, above cited, corroborate these facts. *Mosser* (C. Vol. 1, pp. 366–369) saw "B" at Drawbaugh's shop (Ans. 17), at least as early as Jan., 1878 (Ans. 3, 4). *Theodore Grissinger*, a most prejudiced witness, was never at the shop after the clock company discontinued operations in the spring of 1879 (C. Vol. 1, p. 531, Ans. 194), but is obliged to admit seeing "A" (Ans. 177), "D and E" (Ans. 37, 128, 134, 152), and that he saw "D" there frequently (Ans. 138). *Holsinger* was called by complainants (C. Vol. 2, pp. 1210) and in answer 24, p. 1218, was made to substantially repeat his former deposition given in behalf of defendants. *Matthews* (C. Vol. 1, pp. 540–551) was at the shop in the spring of 1878, about May 1st (Ans. 7), and saw instruments which he imperfectly remembers, but which were evidently telephones, and possibly "D" and "E." (Ans. 14, 33, 35, 36, 37). When witness asked Drawbaugh about the telephone, he reached to a bench or shelf and took these instruments and showed him—it required no time nor effort to get them. (Ans. 53, 55.) Witness "paid very little attention to them." (Ans. 37.) *A. Ditlow* (C. Vol. 1, pp. 967, 968) was never in Pennsylvania after March 19, 1877 (Ans. 6), but heard of Drawbaugh's talking machines before he left for the west on that day. (Ans. 16.) *J. Ditlow* (C. Vol. 1, pp. 959–961) heard of them before he went west on March 19, 1877. (Ans. 7, 31, 36.) *J. Evans* (C. Vol. 1, p. 984) heard of them frequently as early as 1877. (Ans. 83.) *Kahney* (C. Vol. 1, pp. 994, 995) heard of them soon after the Centennial. (Ans. 48–59.) *C. A. Landis* (C. Vol. 2, p. 1070) saw "B" and "F" there between March 31 and April 13, 1877

(Ans. 7–9.) *A. L. Rupp* (C. Vol. 2, pp. 1113, 1114) saw and talked through talking machines there in the winter of 1877–8. (Ans, 18, 19, 23–34.) *Geo. C. Rupp* (C. Vol, 2, pp. 1123, 1124) saw and talked through talking machines there in the winter of '77–'78 (Ans. 16–21); cannot say whether it was before or after Christmas, 1877 (28); and identified "A" as looking like the instrument at which he listened. (Ans. 22.) *Jacob May* (C. Vol. 2, pp. 1565, 1566) saw "A" (Ans. 25) and probably "F" (Ans. 28) when there in, probably, 1878. *Henry S. Rupp* (C. Vol. 2, pp. 1128–1160) saw and talked through an instrument at Drawbaugh's shop (Ans. 59) probably "B" (see Ans. 62, 63) and thinks this must have been in 1877 (Ans. 59, 60, 61). It was probably, however, in 1871 or '72 instead of 1877, as we judge from the following facts, viz.: 1st. That "B" was used instead of the later and better instruments. 2d. That witness fixes the time as when he was getting some pipes fixed (Ans. 60) but got pipes fixed there in 1871 or '72 (Ans. 130). 3d. When he saw the telephone there the electric clocks were only the two old, crude, unfinished structures (Ans. 144, 145, 146, 153) and were quite a recent invention of Drawbaugh's (Ans. 154–155); and, 4th. That the occurrence was so very long ago as to have entirely faded from the witness' memory, and only been recalled through the efforts of complainants' counsel just before going on the witness stand (Ans. 172).

Secondly. As to new and highly organized and improved telephones making their appearance at Drawbaugh's shop after "D" and "E" were made in January and February, 1875, and from time to time from that date to 1880.

Five of these new instruments appeared before September 1, 1876, viz.: "L," "M," "G," "O" and "H." Of these five instruments "L" and "M" were made first, "G" and "O" next, and "H" last. (Drawbaugh, D. Vol. 2, p. 800, Ans. 293-297). Drawbaugh is unable to give the exact dates when these instruments were made, but the date of "H" is clearly established by the other evidence, and that approximately fixes the dates of "L," "M," "G" and "O."

Of these instruments "L" and "M" were originally made in the form represented in Exhibit reproduced L drawing and Exhibit reproduced M drawing, shown on p. 18 of defendants' book of drawings. (Drawbaugh, D. Vol. 2, p. 804, Ans. 309.) They then each combined a carbon transmitter with a receiver in one and the same instrument—a result never before accomplished. Afterwards their hard carbons were removed and permanent magnets substituted, thus rendering them magneto-telephones. (Ans. 310.) In this form they are filed in evidence as Exhibits "L" and "M," and are represented by the drawings on p. 17 of defendants' book of drawings. They are described by Mr. Drawbaugh on pp. 801-5 (D. Vol. 2), by Knight (Id. pp. 721-6), and by Park Benjamin (Id. pp. 1198-1200). The change from the combination of carbon transmitter and receiver to the magneto form, in these instruments, was made after the production of instrument "H." (Drawbaugh, p. 805, Ans. 315.) Instruments "G" and "O" are in evidence, are illustrated on pp. 7 and 20 of defendants' book of drawings, and are described by Mr. Drawbaugh (D. Vol. 2, pp. 806-7), by Knight (Id. pp. 720-21), and by Park Benjamin (Id. pp. 1195-8). "O" was originally the same as "G," but was afterwards slightly modified in respect to the means of connecting the carbons to the diaphragm (Drawbaugh, near middle of p. 807). They are both carbon transmitters, employing *hard carbon blocks or balls* instead of the pulverized carbon before used in instrument F. Instrument "H," a very complete and highly organized carbon transmitter, with hard carbon blocks, is in evidence as Exhibit H; is represented on pp. 9, 10, 11 of defendants' book of drawings, and is described by Drawbaugh (D. Vol. 2, pp. 795-7), by Knight (Id. pp. 719-20), and by Park Benjamin (Id. pp. 1200-1). Only very slight changes have been made in it, such as using a thicker diaphragm and using a steel spring instead of a brass spring. (Drawbaugh, Ans. 277-281, p. 798.) A call bell was attached to it a short time after it was made—possibly some months after. (Id. Ans. 278.)

THE DATE OF INSTRUMENT H.

The date of instrument "H" is positively fixed by *William P. Chambers* (D. S.-reb., pp. 671-679); *George W. Dunlap* (Id. pp. 581-589), and others, as prior to September 1, 1876. *Dunlap* testifies (Ans. 5) that he never was in Drawbaugh's shop but once, that that visit was in August, 1876 (Ans. 6, 7), and that he then saw talking machines there (Ans. 28, 30), one of which he distinctly remembers and clearly describes as "a black-walnut box, eight or ten inches high, about five in width, *with an inclined front* with a mouthpiece *on the front side*, (Ans. 29) and he recognizes "H" as being like the machine (Ans 30). Soon after that visit, he told W. P. Chambers about what he had seen (Ans. 49), and Chambers went down to see it, about two weeks after witness' visit to the shop. (Ans. 58). After Chambers had seen it, he and witness talked it over (Ans. 59, 60). *Chambers* testifies that on September 5, 6, 7 and 8, 1876, he was at the Centennial with the Hope Fire Company, of Harrisburg (Ans. 9, 10), which date is also fixed by the books of the Fire Co., (see Etla, Id. pp. 589, 590); that he never was at Milltown but once in his life (Ans. 11), which was just one week before going to the Centennial with the Hope Fire Company (Ans. 13, 14), and was in the last week of August, 1876 (Ans. 12). Dunlap had told him of Drawbaugh's wonderful talking machines before that (Ans. 19, 20), and witness went to Milltown from curiosity to see the talking machine (Ans. 26). He saw the machine there, and describes it as follows, (Ans. 26):—"The part which I saw resembles a cornet-box that I had with me at the time. It was made of walnut. My cornet-case was thirteen inches long and eight inches wide and three and a half inches high. *I set the case on the work-bench beside the machine, and remarked to Dan that it would make a good cornet-case, the only difference being the inclined face-board.* The talking machine, as it was called then, *had a bell on the top and a mouthpiece in the center of the inclined face.* I remember distinctly of him telling me that I could play a cornet solo in Newville and he would have the benefit of it at the mill—that is, play into the machine. Just while I was there he *opened the face*, and I remember of seeing *in the right-hand corner* what I supposed to be *a small tin can with wires attached.* When he was about to explain to me the use of it, there was a man came into the shop, and asked Dan whether he had his clock done yet. As I understood, he was fixing a twenty-four hour clock for the man, and had promised to have it done for three weeks—had had it on hand for three weeks. That called him away from the machine, and that was the last I saw of it. It spoiled my interest." Witness then identified "H" as the machine which he saw there that day (Ans. 47), and upon opening the door of the instrument, identified the *induction-coil* as the "tin can with wires attached," which he had seen in the same position in the instrument in August, 1876. (Ans. 49.) He also recognized the "circle" (diaphragm and its attachments), which he had seen on the inner face of the door of the instrument in 1876 (Ans. 49), and the binding-posts on the exterior of the box. (Ans. 51). This witness is a well-known citizen of Harrisburg, and a man of the highest character.

In view of the testimony of Dunlap and Chambers, there can be no possible doubt that instrument "H" existed in Drawbaugh's shop as early as the last of August, 1876, in substantially its present condition. *Ira D. Kahney* (D. Vol. 1, pp. 202–3, Ans. 22–24) saw it there soon after his return from the centennial.

Henry F. Drawbaugh (Id., pp. 406–7) saw it there (Ans. 71) while running the cars (Ans. 73), and thinks it was during the first year of his running the cars (Ans. 73), which would fix it as in 1876 (Ans. 19). Daniel Drawbaugh, while living at Mechanicsburg (pp. 413–4, Ans. 3), came to witness' car and asked witness to get him some plumbago, but when witness returned he found that Daniel had already obtained some, and saw him working with it in the shop (same Ans.). Daniel was putting the plumbago in this machine, "H" (p. 412, Ans. 117). Witness identifies the extremely light and delicate spring carbon-holder of "H" (same Ans.). The fact that Daniel was living at Mechanicsburg fixes the time as between April 1, 1876, and April 1, 1877 (D. Drawbaugh, Vol. 2, p. 749, Ans. 3). *W. H. Bates* (D. Vol. 1, p. 419) was never in Drawbaugh's shop after the fall of 1877 (Ans. 4, 44), but saw "H" there in the summer or fall of 1876 (Ans. 19, 20, 67, 69), immediately after some conversation between him and Drawbaugh about the Centennial, which was then in progress. *Geistweit* (Id., pp. 460-1) was never at Drawbaugh's shop after the fall of 1876 (Ans. 24, 25), but, while there, saw a talking machine instrument resembling Exhibit "H" (Ans. 30-33). *Dr. J. W. Moffitt* (Id., p. 496, Ans. 16) saw "H" at the shop, with a great many other talking machines, between the years 1873 and 1880, but is unable to fix the date when he first saw this instrument. *Michael Dellinger* (Id., p. 538, Ans. 2, 4, 5) saw it there in November, 1877. Was never there afterwards. (Ans. 11.) *Henry Dellinger* (Id., pp. 539-40, Ans. 7, 12, 13) saw it there early in June, 1877. Was never there after 1877. (Ans. 18.) *John Dellinger* (Id., p. 542, Ans. 1-7) saw it there in June, 1877. Was never there after that visit (Ans. 13). *Shettel* (Id., pp. 206-25) saw it there early in the spring of 1877 (Ans. 14, 15, 16, 17, 18), the year before the Clock Company business was started (Ans. 19); the bell was then on it (Ans. 20); the instrument appeared to be in the same condition as now. (Ans. 139.) *Matthias* (Id., p. 547-8) saw and talked through it in 1877, in warm weather, towards fall, using "H" as a transmitter and "E" as a receiver (Ans. 4-12). *Musser* (Id., pp. 608-9, Ans. 15) saw it in 1878. *Harman K. Drawbaugh* (Id., pp. 556-7, Ans. 53, 55) recollects his uncles' working on "H" prior to the latter part of October, 1876. *Jefferies* (D. Vol. 2, pp. 678-84) was first at Drawbaugh's shop in 1876, about a week after the November election (Ans. 1-5); saw talking machines there at that time

(Ans. 6–11): was there again that fall, before Christmas (Ans. 12–16); saw "H" there in the fall of 1876 (Ans. 21); observed and commented at the time on the "coffin-hinges" of its door (Ans. 23, 24—witness was a carpenter, and his attention was attracted by something pertaining to his own line of business); the bell was on the instrument at that time (Ans. 25); the instrument was in a firm position against the wall, and was evidently fastened there for use (Ans. 26); Drawbaugh rang the bell, and explained how to speak into the mouthpiece on the front door (same answer); it was connected with wires, one of which ran down through the floor (Ans 27). *John T. Smith* (D. Vol. 2, pp. 684–7) was never at Drawbaugh's shop after 1876 (Ans. 4), and his last visit there was in the week in which "Pennsylvania day at the Centennial occurred" (Ans. 5, 6); was at the shop about three times prior to that—four times in all (Ans. 7); saw "H" there, and thinks it was before his last visit (Ans. 8, 9); it was lying on the table or bench, with the lid open, and machinery inside, and had the bell on top (Ans. 10, 11). Drawbaugh explained that the bell was to give the alarm when he was ready to throw sound through (Ans. 12). "*Pennsylvania day at the Centennial" was September 28th, 1876*, (See Examiners' certificate, top of p. 749, D. Vol. 2). *F. F. Landis* (D. S.-reb., pp. 899, 900, Ans. 15–25), saw "H" in November, 1877: the date is fixed by a letter printed on pp. 902, 903, the visit being within a week after the date of the letter (Ans. 31–35). "H" was then fastened up against the wall of the room (Ans. 15, 17, 21, 42), in plain sight (Ans. 46). It "was a wooden box, ten or twelve inches high, and from six to eight inches wide, with a mouthpiece or funnel-shaped hole, resembling the mouthpiece or hole in the small instrument that he spoke through " (Ans. 20). *John C. Smith* (D. Vol. 1, p. 339), also saw "H" fastened up against the wall (Ans. 55), and talked through it (Ans. 56); saw it before he saw "J" (Ans. 58); but is uncertain whether he first saw it before or after his father moved away in the fall of 1878 (Ans. 54, 47), although he knows he saw it afterwards (Ans. 54).

DATES OF DRAWBAUGH'S TELEPHONES, "L," "M," "G," "O."

The date of the instrument "H" being fixed, therefore, at least as early as August, 1876, it follows from Drawbaugh's testimony, above cited, that the dates of "L," "M," "G" and "O," were at different times along from February, 1875, to August, 1876. Of these four instruments, "L" and "M," unlike the instruments heretofore commented upon, have no distinguishing external feature by which the ordinary casual observer would be likely to remember and identify them from other talking machines, and hence Drawbaugh's testimony must be mainly relied on for their dates. *Holsinger* (D. Vol. 1, pp. 360–75), who was never at the shop after November 27, 1876 (Ans. 9,) saw their magnets, which are of a peculiar shape, a short time before he moved away (Ans. 37, 38), but is doubtful whether he ever saw their boxes, and whether he ever saw "G and O" (Ans. 37, 39). *Springer* (Id. pp. 182, 191), who lived at Milltown from April 1, 1876, to January 6 or 7, 1877 (Ans. 3), and has never been in Drawbaugh's shop since (Ans. 61), saw "G and O" about October, 1876 (Ans. 25, 7), and talked through them (Ans. 26, 27), but, although he was there a great deal while he lived in Milltown, did not see Drawbaugh making these instruments (Ans. 28), which would indicate that they were made prior to April 1, 1876. *Henry Dellinger* (Id., p. 540), saw "L and G" early in June, 1877; *John Dellinger* saw "M" in June, 1877 (Id. p. 542); *Henry F. Drawbaugh* and *Dr. Moffit* saw "L" and "M," "G" and "O," but can fix no date; *Matthias* (Id., p. 548), saw "G" and "O" in the summer of 1877, towards fall; *W. S. Dellinger* (Id., p. 441, Ans. 21, 22), saw "G" and "O" in 1877, and the fact that his brothers were with him at the time (Ans. 123–126) fixes it as early in June, 1877; and *Harman K. Drawbaugh* (Id., p. 557, Ans. 55) saw "O" while on the freight line, between October, 1876, and September, 1877. (Ans. 53, 59.)

The defendants made no special effort to cumulate testimony to fix the date of the machines "G," "O," "L," "M," for the reasons that these machines are somewhat difficult to accurately identify, and are inconsequential in view of the evidence as to the other prior instruments and their successful use.

Dates of Drawbaugh's Telephones, "J," "N," and "P."

After the five machines, "G," "O," "L," "M" and "H," came three other telephones, all in evidence, and marked J, N and P, respectively. Of these, "J" and "N" came first and "P" last (D. Drawbaugh, D. Vol. 2, Ans. 342, p. 814, Ans. 350, p. 818), it being uncertain whether "J" or "N" was the earliest. "J" is a very highly organized carbon-transmitter, made on the general plan of the instrument "H" which preceded it, but having a sort of multiple action; no changes have been made in it (Ans. 334). It is referred to by Drawbaugh (Id., pp. 808–13), Knight (Id., p. 736, 742) and Park Benjamin (Id., p. 1202) and is illustrated on pp. 14, 15, 16 of defendants' book of drawings. In making it Mr. Drawbaugh was assisted by his nephew, *George W. Drawbaugh* (p. 808, Ans. 328), who testified (D. Vol. 1, p. 603, Ans. 63–66) that it was made in 1878 between spring and fall. *Daniel Drawbaugh* testifies (D. Vol. 1, p. 813), that it was made in 1877 or 1878, but he cannot fix the exact time (Ans. 335–337). The works were first made and the case afterwards (Ans. 339), the former by Daniel Drawbaugh, the latter afterwards by George (George Drawbaugh, D. Vol. 1, pp. 600-1, Ans. 40, 41, 42). It was seen at the shop in 1879 by *Smyser*, *I. D. Kahney*, *Chas. L. Free*, and *Jefferies*. It was tested on the Bell telephone line at Stees' office in May, 1878 (Stees, Add. Proofs, pp. 209–220; Johnson, Id., pp. 198-209), and is probably the instrument referred to in the article published in the Mechanicsburg Independent Journal of April 17, 1878. (Compl'ts' Vol. IV, p. 330.)

The instrument "P" was made by Daniel and George Drawbaugh in 1878 (George Drawbaugh, D. Vol. 1, p. 600, Ans. 35, 36), some months after Exhibit "J." (Daniel Drawbaugh, D. Vol. 2, p. 814, Ans. 343); Daniel making the works, and George the case (Id., Ans. 341; George Drawbaugh, D. Vol. 1, p. 600, Ans. 36). It was seen and talked through by *Clendennin* in November, 1878 (D. Vol. 1, p. 522), which fixes its date as early as the fall of 1878, and the date of "J" as at least several months prior to that time. It was also seen and talked through by *Kline* in the spring of 1879 (D. Vol. 1, p. 628).

It is a very highly organized machine, capable of being used as a carbon transmitter, a receiver and a magneto telephone; and is described by Daniel Drawbaugh (D. Vol. 2, pp. 814–17), Knight (Id., pp. 728–35) and Park Benjamin (Id., p. 1203), and illustrated in defendants' book of drawings (pp. 21, 22, 23, 24, 25.)

Instrument "N," described by Drawbaugh (D. Vol. 2, pp. 817–20), by Knight (Id., pp. 735–7), by Park Benjamin (Id., p. 1204), and illustrated on page 19 of defendants' book of drawings, was a small magneto telephone, with a permanently polarized steel diaphragm (Drawbaugh, Ans. 358), which, however, was not the first steel diaphragm used by him, as he had before employed diaphragms of steel on L or M (Id. Ans. 360). This instrument was produced in 1877 or 1878, and is, therefore, inconsequential in this suit, so far as concerns any direct bearing on the Bell patents, although it was made before Exhibit P (Drawbaugh, Ans. 350). It closely resembles "E," "L" and "M" in external appearance, and was probably mistaken for "E" by J. F. Smith, who thinks he saw it in 1876. (D. Vol. 2, p. 686.) It was seen by *Steigelman* on Aug. 8th, 1878 (D. Vol. 1, pp. 609–611), by *Reeser* on the same day (Id., p. 611), and by *H. F. Drawbaugh* and *Dr. Moffit*, who fix no date for it. Two incomplete instruments, Q and K, are in evidence, but were made probably in 1879, and are of no materiality in the case. (See D. Drawbaugh, D. Vol. 2, pp. 820–3.)

Drawbaugh's relations to the "Blake Transmitter."

Complainant's counsel, in their presentations of these cases in the courts below, have savagely attacked the dates of Drawbaugh's transmitters, "H" and "J," arguing that they are mere copies of the "Blake Transmitter," and that, therefore, they *must* have been produced after Drawbaugh had knowledge of the latter instrument.

A few plain, clearly-proven facts will conclusively answer this unfair argument.

First. They are *not* copies of the Blake Transmitter, although quite similar in general principles.

Second. The Blake Transmitter was not *patented* till November 29, 1881, more than a year after this suit was begun (Add. Proofs, p. 313).

Third. It was not *introduced into use in Pennsylvania* till the spring of 1880, a few months before this suit was begun. (Add. Proofs, test'y. of Johnson, Ans. 59, 60, p. 203; test'y. of Stees, p. 210, Ans. 11; also Complainants' Record, Vol. 2, p. 1032–3, Ans. 64, test'y. of Ziegler.)

Fourth. It was not *invented* till some time between July 4, 1878, and November, 1878. (See Blake's Preliminary Interference Statement, Add. Proofs, p. 311.)

All the testimony in the Drawbaugh case goes to prove, beyond a doubt, that instrument "H" was produced about two years before instrument "J." It is proved by by Stees and Johnson (Add. Proofs, pp. 198–220), and corroborated by Drawbaugh (D. Vol. 2, p. 1012, 1,014, Ans. 1376, 1393), that this instrument, "J," was taken by Drawbaugh to Stees' office, in Harrisburg, about May 10, 1878, and tested on the Bell telephone line, and left with Mr. Stees about three months. Johnson and young Stees identify the instrument positively. They examined its internal construction at the time, and identify its mechanism as well as its case. Both of them recognize even its induction coils; and Stees swears to having himself accidentally dropped the instrument on the floor and *lost out its little carbons* at the time while it was in his father's office.

There is not a word of evidence in the record to meet this positive and circumstantial statement of two unimpeached and unimpeachable witnesses; nor can any amount of sophistry shake their dates. The fact that the test of instrument "J" was made when the "Phelps Snuff-Box Instruments" were in use on the Harrisburg telephone lines, and before the "crown" instruments displaced those of the "snuff-box" form, itself establishes the date as certainly prior to the winter of 1878–9; and the positive statement that the test was made immediately upon young Stees' return from the west, and before Johnson went to work for the transfer company, fix it beyond all question as in May, 1878.

This was before the "Blake Transmitter" was even thought of by its alleged inventor, Blake.

For the dates when the "Phelps Snuff-Box," the "Crown" and the "Blake Transmitter" were actually introduced into use at Harrisburg and used there on the Bell telephone lines, see testimony of complainants' witness Ziegler, (C. Vol. 1, pp. 1025–35) as well as of Stees and Johnson, in the Overland Record.

Instrument "J" is manifestly an improvement upon instrument "H." We do not need to be told which was made first, for a glance at them tells the story so plainly that further evidence is superfluous. But human testimony can help us to ascertain *how long first*, the instrument "H" was made. All the witnesses, as we have already seen, concur in fixing "H" as about two years prior to "J."

The "Blake Transmitter" was the first carbon transmitter ever introduced into practical use on telephone lines. Was Daniel Drawbaugh, who, before Blake ever dreamed of a telephone transmitter, invented and perfected these two wonderfully developed and perfect instruments, "H" and "J," a "charlatan" or an "ignoramus?" Where did he get his knowledge of *carbon* transmitters at that early date? Who taught him how to make Blake Transmitters months before Blake ever dreamed of them? Is there any doubt that the man who could invent and perfect the carbon transmitter is a genius of the highest order, fully capable of inventing the whole art of electric speech transmission? Is there any doubt that his perfected carbon transmitter "H," of 1876, was preceded by a long line of other telephone instruments gradually approximating the perfected form, just as he has testified?

All the instruments produced after Feb. 14, 1876, to wit: L, M, G, O, H, N, J, and P, are good working telephones, as we learn from an inspection of them, and from the testimony of Park Benjamin, Daniel Drawbaugh, and the other witnesses who talked and heard speech transmitted through them from time to time as above set forth.

This completes the review of Mr. Drawbaugh's telephone instruments, from their beginning in 1866 or earlier down to 1880. Except the old original teacup transmitter and its receiver, all the instruments are in evidence in whole or in part—the material parts of all those produced prior to instrument I, of 1871, being in evidence, and instrument I, with all thereafter produced, being in evidence in their entirety. The chronological order of Drawbaugh's machines, as established by the evidence, is as follows:

Teacup transmitter and receiver	1866-7
F and B	1867-1869
C	1869-1870
I	1870-1871
A, with mouthpiece at center	1873
A, with mouthpiece at side of center	1874
D and E	January and February, 1875
L, M, G, O,	from February, 1875, to August, 1876
H	August, 1876
J, N, P,	1878

Between these several instruments, and perhaps even prior to the teacup transmitter, crude temporary experimental structures were produced, testified, modified, or, perhaps, thrown away, as is always the case with the production of inventions involving great study and labor. Drawbaugh (D. Vol. 2, p. 828, Ans. 402, 403), testifies that such was his habit while developing his telephone invention. Harman K. Drawbaugh (D. Vol. 1, p. 559) testifies that "D" and "E" grew out of such structures which his uncle had made prior to January, 1875, and (Ans. 75) that he knew of other temporary experimental structures as early as 1872. Henry F. Drawbaugh (D. Vol. 1, pp. 405-6, Ans. 71) alludes to seeing one of these temporary structures "among the first that he was working at," and which he states was in 1872, although it was probably in 1866 or 1867, and may have been the receiver used with the old teacup transmitter. Our reason for thinking that it was in 1866 or 1867 instead of 1872 is that Henry F. Drawbaugh does not recollect anything about the talking machines prior to 1872, and therefore fixes all his dates from that year, whereas it is conclusively proved that he was cognizant of the invention in 1867, 1868 and 1869, and was telling others of it at that time. (See testimony of Bricker, D. S-reb., p. 1083); Spafford, Id., p. 1089; McHenry, Id. p. 1092; William

North, Id., p. 1102; Samuel A. North, Id., p. 1105; Murphy, Id., p. 1063; Graham, Id., p. 1057; Dougherty, Id., p. 1131).

In this connection, it is proper to call the attention of the court to the remarkable fairness and candor shown by all the Drawbaughs in giving their testimony, and to their self-evident freedom from any disposition to push their dates back earlier than the facts would warrant.

The Natural Evolution of Drawbaugh's Instruments.

In reviewing this series of instruments, their perfectly natural development, one from the other, appears conspicuously, and is strong internal evidence of the truthfulness of the history. First, he makes the old teacup transmitter, and develops its receiver to the form shown in Exhibit Drawbaugh sketch No. 2. (D. Vol. 2, p. 762.) Then by experiment he finds that the pulverized low conductor should be more closely confined, and the pressure upon it rendered more easily adjustable; and, hence, the idea of placing it on a suspended adjustable box occurs. He also discovers that the sounds should be converged upon the diaphragm, and this leads to the wooden cover and mouthpiece. The result of these changes is the tumbler transmitter, Exhibit "F." In working with the receiver, he discovers that the string and spring armature-support are superfluous, and thus the receiver develops into Exhibit "B." In the trial of different materials for diaphragms, he finds that sheet metal or other hard materials will answer the purpose better than the membrane, and this leads to the metal diaphragm of Exhibit "F" reproduced. But the tin can B is crude and imperfect, and so he goes to work to make a new receiver C of more perfect construction. He tries this first with two connected membrane diaphragms as an experiment, but finds one superfluous, discards it, shortens up the box or case so as to bring his ear nearest to the vibrating surface, and applies a thin metal diaphragm to the receiver, as he had already on the transmitter. In working with this, the idea occurs to him of testing it as a transmitter, with B as a receiver, and he gets some results, but probably feeble. He discovers that by placing a permanent magnet against the heel of the electro-magnet and thus giving the electro-magnet stronger polarity, these results are wonderfully improved, and this produces the magneto-telephone, Exhibit C reproduced. But in C reproduced the parts are all exposed and inconvienently arranged; he goes to work to enclose them; the attempt to enclose suggests arranging the permanent magnet more compactly; and from these studies comes instrument I, the first telephone having all the parts securely and rigidly enclosed in a box or case. Continued experiments satisfy him that the enclosed space between the mouth orifice and diaphragm should be reduced as much as possible, and hence he arrives at the second and flat form of cover to "I," the inner surface of which is quite close to the surface of the diaphragm. He conceives that the instrument can be still further condensed and compacted, and, probably after numerous experiments, Exhibit A is the result,—a very compact and convenient instrument, but, like C and I, having a diaphragm of large diameter. The large diaphragms were observed to give false vibrations, and, after further experiments, he conceived the idea of damping out the false vibrations by means of an adjustable rubber pad, and, hence, moved the mouth orifice to one side of the center, and applied the dampening pad and screw. Still further experiments convinced him that the diaphragms themselves were at fault, and he discovered that by reducing them in size, the best results could be attained. He made crude instruments to test and settle the matter, and, finding his conclusions verified, reconstructed his crude experimental instruments into two small, compact working instruments, Exhibits "D" and "E," in January and February, 1875.

The magneto-telephone was now completed—perfect. No higher development of it has ever yet been made by all the skill, science and ingenuity of the world. *We do not, to-day, know that it can be carried further than Drawbaugh had carried it as early as March 1, 1875.*

But operations to construct an improved carbon transmitter had been suspended, from about 1870, when the first magneto-telephone was made, until the final perfection of the magneto-telephones in Exhibits "D" and "E," although, meanwhile, he appears to have used F quite commonly in testing the quality and effects of different low-conducting substances, and, perhaps, to resolve other questions that occurred from time to time. But having, in February, 1875, reached high-water mark so far as the magneto-telephone was concerned, Drawbaugh again, after the production of "D" and "E," turned his attention almost exclusively to the further development of the carbon transmitter. The carbon transmitting instrument could not be used as a receiver, while, on the contrary, the magneto instruments could be used for both purposes. The thought occurred to him that, possibly, an instrument could be made which would combine in one a carbon transmitter and a receiver. He had demonstrated that the small, compact form of "D" and "E" was advantageous, and he, therefore, studied to produce an instrument nearly in the same form, combining the carbon transmitter with the receiver. To accomplish this the carbon must be arranged more compactly than in the old F. The idea dawned, of consolidating the carbon into blocks and arranging these blocks in a small, narrow, tube-shaped cup instead of the wide, flat cup of instrument F. It was about this time, probably, that Holsinger, who was never at his shop after November 27, 1876, saw him baking the carbon composition into small cakes, as set forth in D. Vol. 1, p. 366, Ans. 56, 57. After experimenting with these cakes of hard carbon in a temporary tumbler instrument (Holsinger, Id. Ans. 57), he arranged them as in reproduced instruments "L" and "M," in which the small cakes were supported in a tube placed, evidently for the purpose of compactness, between the coils, and in which a permanent magnet was arranged beneath the coils, and the electric connections were such that the same instrument served both as a carbon transmitter and a receiver. The hard carbons worked satisfactorily, and he determined to construct a pair of transmitters with hard carbons, without combining receiving mechanism in the same instrument, and from this resulted "G" and "O." After making "G" and "O," he used L and M for further experiments, and finally took out their carbons and retained them as simple magneto-instruments.

Meanwhile he had been testing the effect of an induction coil with them, as stated in his 289th, 290th and 291st answers, pp. 799, 800, and it was found to be of important advantage; and he determined to construct an instrument combining in one all the important improvements in his carbon transmitters: As the result, Exhibit "H" appeared in August, 1876, with its metal diaphragm (from old F) corrugated (from old C) and having false vibrations damped out (from old "A") with the small diaphragm (from old "D" and "E") and the induction coils. At some period, he had recognized the desirability of an alarm, to call the attention of the operator when a person at the further end of the line wished to communicate, and to this completed and perfected instrument he attached a magneto-alarm bell. The carbon transmitter was perfect in L, M, G and O, but, in H, it was brought to almost the present commercial form, and provided with every appliance necessary for practical business purposes.

In 1876 or 1877, however, he conceived that several currents, all modified independently by separate sets of carbons, might be united on the main line, and thus more powerful and far-reaching effects be attained for long-distance lines; and as a result of his studies in this direction, the multiple instrument, J. appears, in the spring of 1878. At about the same time, "N" was made to exhibit the effects of a permanently polarized steel diaphragm. And, lastly, all the carbon and magneto improvements were combined in one large-sized instrument "P," in form adapted for convenient practical use.

Nothing can be more convincing to the mind as to Drawbaugh's originality and priority of invention than this review of its gradual and natural development from the first crude experimental instruments to the perfected receiver "A," in 1874, the perfected magneto-telephones, "D" and "E," in January and February, 1875, and the perfected carbon transmitters, "L," "M," "G," "O," and "H," between February, 1875, and August, 1876, especially when studied in connection with the overwhelming evidence as to the dates of the several instruments and improvements made by him. The invention was undoubtedly in a patentable condition as soon as the magneto-instruments "C" and "I" were produced, in 1870 and 1871, and possibly before; but it was completed in every respect, even in form for immediate commercial use, in January and February, 1875, in instruments still extant and serviceable, and which the complainants' experts are obliged to admit are perfected magneto-telephones, and of which the complainants' counsel, in their brief in the Overland case, in January, 1884, stated that "A is a highly organized magneto-receiver with a neutral magnet. The case is of black walnut, nicely "turned, and furnished with screw cups to attach the wires to," and "D and E are a pair of magneto-instruments with permanent magnets. They are highly organized, inclosed in turned, black walnut cases, and with most of the refined improvements of detail found in the best commercial instruments of to-day, though they are rather feeble," and further stated, in their printed argument in the same case, to be "perfect magnetos."

The great invention thus produced by Mr. Drawbaugh in advance of all other claimants, instead of bringing him merited honor and fortune, resulted, as has often been the case in the history of the arts, in bringing upon him ridicule, neglect, and a terrible struggle for even the necessaries of life.

Efforts of Drawbaugh to interest others in his telephone inventions, and reasons why he did not succeed in such efforts.

The value of the speaking telephone was then unknown and unappreciated; it was, in the eyes of most men, a curious but practically worthless scientific toy, as the more wonderful phonograph still remains. The complainants' own evidence proves this conclusively. The Scientific American of October 6, 1877, spoke of many people having hastily pronounced the Bell telephone only "a beautiful scientific toy" (C. Vol. 1, p. 273). The New York Tribune of November 9, 1876, seemed to think that its practical use would be mainly for *diplomacy and courtship*. "Of what use is such an invention? Well, there may be occasions of state when it is necessary for officials who are far apart to talk with each other without the interference of an operator. Or some lover may wish to pop the question directly into the ear of a lady and hear for himself her reply, though miles away; it is not for us to guess how courtships will be carried on in the twentieth century." (C. Vol. 1, p. 250.) Mr. Bell's financial backer, Gardiner G. Hubbard, an old telegraph man, had no faith in the pecuniary value of transmitting speech in place of the telegraph, and "discouraged work upon the speaking telephone." (C. Vol. 2, p. 1613, near bottom of page.) Gardiner G. Hubbard testified in the Dowd case as follows:

"Int. 15. State whether or not Professor Bell talked with you during the summer or autumn of 1875 upon the subject of the electrical transmission of speech, and how much his mind seemed to be occupied with that subject?

"Ans. He did speak with me. His mind seemed to me to be occupied with it *a great deal more than was to my pecuniary advantage, as I did not then believe the transmission of speech could ever be made commercially valuable*, and I *remonstrated with him for spending so much time upon the subject*.

"Int. 16. What did you want him to spend his time upon, and why?

"Ans. Upon instruments that would transmit many musical notes simultaneously, or upon an autograph telegraph upon which he was working, *as I believed such instruments would be of more pecuniary value than any instrument for transmitting speech.*" (C. Vol. 2, p. 1662; C. exhibits, 959.)

Not only Mr. Hubbard, but also Mr. Sanders held this belief, as Mr. Bell testifies near the bottom of p. 1666, C. Vol. 2:—

> "At that time I was again working at the combination of instruments necessary to put my autograph telegraph into practical operation, *as Mr. Hubbard and Mr. Sanders thought that it would prove the most immediately valuable of all my inventions.* It was their understanding that I should devote the greater part of my time to the improvement of this application of multiple telegraphy."

Mr. William Orton, president of the Western Union Telegraph Company, had knowledge of the Bell telephone as early as April 7, 1877, as appears from the letter signed by him and others, printed in C. Vol. 1, p. 270, and had his attention pointedly called to it by Mr. Pope, the "special advisory electrical expert" of that company, and also of the Gold and Stock Telegraph Company, of which Mr. Orton was likewise president, *yet he did not stir in the matter of attempting to acquire an interest under it till the summer or fall of 1878*, as we learn from Mr. Pope's deposition (C. Vol. 2, pp. 1285–1287, Ans. 1, 2; p. 1428, Ans. 318, 314). And Mr. Bell says that he, himself, kept his mouth very closely shut at first, fearing that *ridicule* would be attached to the idea of transmitting vocal sounds telephonically (C. Exhibits, p. 986). The accidental presence of two great men, the Emperor of Brazil and Sir William Thompson, at the Centennial, and their enthusiasm over even the idea of electrically transmitting speech, undoubtedly did more to render the telephone immediately famous and eventually successful as the basis of a commercial enterprise than all other causes.

Such being the feeling of business men in the early stages of Bell's telephone, we are prepared to understand the reluctance of Drawbaugh's acquaintances to invest their money in his invention. He alone, of all who saw and tested the machines, seems to have had something like a correct idea of its future uses and its value. He always presented it to others as a great and valuable invention, and, in spite of their indifference, or commiseration, or ridicule, never wavered in his faith in it; maintaining, from the beginning, as we have already seen, that it would take the place of the telegraph and would eventually be used for communicating speech across the ocean. He told *Shank*, in 1874 or 1875, that it was the greatest invention that ever was known. (Shank, D. Vol. 1, p. 23, Ans. 45); *Waggoner*, in November, 1874, that it would save a great deal of money (D. Vol. 1, p. 123-4, Ans. 21); *Springer*, in 1876, that it would be a fortune to him (Id. p. 187, Ans. 48); *Shettle*, about 1872, that it would be worth a great deal of money (Id. p. 206, Ans. 4); *Weber*, in 1874, that it beat all his other inventions (Id. p. 245, Ans. 55½); *Bates*, that if he could get it patented he could make a fortune out of it (Id. p. 421, Ans. 23, 24); *Wolf*, from Feb. 20 to March 8, 1875, that he would be one of the richest of men if he could get it patented (D. Vol. 2, p. 675, Ans. 8); *Draper*, in 1874, that it was one of the greatest inventions of the age (D. Vol. 2, p. 1126, Ans. 15); *Eicholtz*, in 1873, that there was plenty of money in it (D. S.-reb. p. 154, Ans. 18); *Orlando Kahney*, in 1876, that it would make him an independent fortune (C. Vol. 1, p. 995, Ans. 51). In the year 1876 his whole mind appeared to be on this talking-machine (Springer, D. Vol 1, p. 188, Ans. 58). From Sept., 1873, to Nov. 27, 1876, "He appeared to be crazy on it. I often tried to get information from him on other subjects and about half a minute's talk would turn him right on the talking machines." (Holsinger, Id. pp. 364–5, Ans. 45.) From 1876 to 1880, "His whole heart and desire was on the telephone." (W. S. Dellinger, Id. p. 442, Ans. 45). Mrs. Drawbaugh told Chellis that she had wanted him to lay it aside and he had replied that "he would go to the poor-house before he would give up working on it." (Chellis, Id. pp. 526–7 Ans. 16). In 1874 and 1875, he was most interested in the talking machine and had it most at heart (Updegraff, D. Vol. 2, p. 1087, Ans. 34). From 1871 onward he was working on it nearly all the time, day and night, and often till late at night (Condry, D. Vol. 1, p. 89; Orris, Id. p. 170; Springer, Id. p. 182; I. D. Kahney, Id. p. 201; Shettel, Id. p. 206; Shireman, Id. p. 259; Hawn, Id. p. 266; J. C. Smith, Id. p. 334; Fetrow, Id. p. 347; Holsinger, Id. p. 360; H. F. Drawbaugh, Id. p. 396; Dellinger, Id. p. 439; George Free, Id. p. 484; Moffitt, Id. p. 494; D. M. Ditlow, Id. p. 573; Moore. Id. p. 614; H. K. Drawbaugh, Id. p. 550; J. B. Drawbaugh, Id. p. 575; G. W. Drawbaugh, Id. p. 597; Herr, D. Vol. 2, p. 667; Jefferies, Id. p. 678). And he is still experimenting on it like hundreds of other inventors, trying to get better results than have been yet attained with the speaking telephone (Drawbaugh, D. Vol. 2, p. 805, Ans. 317), and believes that "it has not yet got near to what it will" (Id. same page, Ans. 318).

During all those years, from 1869 to 1880, it was his complete absorption in his great invention that kept him poor. He was a good mechanic and could easily have earned a living, had his mind been free from this controlling influence. *Holsinger*, referring to the period from September, 1873, to November 27, 1876, says (Ans. 45) that Drawbaugh appeared to be crazy on the subject, and in cross-examination testified as follows: (D. Vol. 1, pp. 364-5).

"C. Q. 108. While you lived at Eberly's Mills was not Drawbaugh capable of earning all he needed, if he would only work steadily?

"A. Yes, sir; he did work steadily, intently—never lost a moment, but, *influenced by some supernatural or other power, did not happen to work at such things as did, or would, bring him the required necessaries for the sustenance of himself and family.*

"C. Q. 109. What things did he work at?

"A. He put a great deal of his time in experimenting on his talking machine; *in fact, so near all his time, that he got very little earned.*"

Shettel, referring to the year 1878, says (D. Vol, 1, p. 311-12, Ans. 54, 55) that Drawbaugh's mind was so absorbed in the telephone that he could make no progress for the clock company, and, in consequence, witness sold out and retired from the business. *Chellis*, in 1879 (D. Vol. 1, p. 526, Ans. 15, 16, 17), experienced the same condition of affairs, and in order to induce Drawbaugh to attend to his faucet work more closely, promised to go into the telephone invention with him (Ans. 17-20). *J. B. Drawbaugh*, referring to the period from 1869 to 1880, testifies (D. Vol. 1, pp. 583-7, Ans. 93, 94, 69, 64, 97) that his brother Daniel could have been able to make a good living, and more, if he had not had his mind and his time so completely absorbed in his telephone inventions. *Henry F. Drawbaugh*, referring to the period from his first knowledge of the talking-machine onward, testifies that his brother John was afraid Daniel would go crazy over the subject, and said, at one time: "He is half crazy now with studying." (Ans. 45, D. Vol. 1, p. 401.) *Harman K. Drawbaugh* (D. Vol. 1, p. 567, Ans. 133, 134) testifies that John was accustomed to urge Daniel to leave his invention and go to work at something that would provide for his family. *Herr* (D. Vol. 2, pp. 670–1, Ans. 29, 30), referring to the period from 1870 to 1874, testifies that when he was having some work done by Drawbaugh, the latter would, even in his presence, leave his work and try some idea on the telephone, and thus delayed witness' work. *Harman K. Drawbaugh* (D. Vol. 1, p. 554, Ans. 35) testifies that his uncle, Daniel, was so absorbed in his talking machine in the beginning of 1875, that he neglected a job which he had taken for Wilson Bear and others, and finally got witness to do it for him. . But it is hardly necessary to cite further specific testimony on this point, as all the witnesses concur upon it. Drawbaugh himself testifies (D. Vol. 2, p. 831–2, Ans. 424–426) that his work on the telephone kept him poor, and that even with close economy, he was obliged to contract debts which annoyed him and at times took his attention away from his inventive labors.

Again and again, through all these years, he applied to his neighbors, friends, relatives, and even to strangers, for pecuniary assistance to get his talking machine patented and introduced into use, offering them a half interest in it for their help, but they uniformly declined to invest their money in a talking machine.

Mr. Herr, of Harrisburg, Pa., testifies that, as early as 1870 or 1871, Drawbaugh applied to him for help (D. Vol. 2, p. 668):

"Q. 10. How often did he speak to you about that invention?

"Ans. To the best of my recollection he drawed my attention to it every time he came there after the first time he showed it to me; his object was to secure his invention, by getting a caveat, or some such thing he called it, and he wanted money to get it; he was a stranger to me.

"Q. 11. What did he say about his money matters, and about his wanting to get money to protect his invention?

"Ans. He said he was a poor man, and he couldn't raise the means, *and if I would help him, or procure any person to assist him, he would give me a half interest.*"

CHRISTIAN EBERLY (D. Vol. 1, p. 115-6) testifies that Drawbaugh, prior to Jan. 1, 1871, desired him to go into copartnership with him on the telephone, Mr. Eberly to furnish the money for a half interest in the invention, and witness did not accept the proposal.

HENRY F. DRAWBAUGH (D. Vol. 1, p. 400-1, Ans. 41-43), testifies that from 1872 to 1879 his brother, Daniel, urged him to go in with him and furnish the means for this invention; and failing in this tried to borrow money from him for the purpose, but Henry, like Gardiner G. Hubbard, was fearful there was no money in it (Ans. 45).

Henry once asked a telegraph operator, Mr. Byers (Ans. 111, and see Byers, Id., p. 509), his opinion of its commercial value, and Byers discouraged him about it, and told him the telegraph people never would use it. *Daniel asked Henry to intercede with others to get him assistance, and he tried to do so, and saw different parties for him* (Ans. 56), but evidently without effect.

MAJOR HENRY SNYDER, of Newville, Pa., testifies (Id., pp. 513-5) that Henry F. Drawbaugh came to him half a dozen times, in 1872, 3, or 4, and asked him to go into the enterprise with Daniel, to get the invention patented and establish its manufacture. Henry urged it upon him, assured him of its capacity to perform its work, and offered him a half interest in it, but he declined to go into it.

This testimony was confirmed in the Overland case by the depositions of Major Snyder's son, JOHN H. SNYDER (Add. Proofs, pp. 160–164), and EDWARD W. EBY (Id. pp. 179–181), who fix the date positively as just prior to June 19, 1873.

HENRY BAYLOR, of York, Pa., testifies (Id., pp. 150–7), that from June, 1873, till the spring of 1876, Daniel Drawbaugh urged him to advance the means to patent it, and to take a half-interest in it. (Ans. 5.) Drawbaugh urged it on him whenever they met (Ans. 18), and at one time in 1873 witness was almost induced to risk a few hundred dollars in it, and would have done so had he not been in an anxious state of mind over his own business.

THOMAS DRAPER, of Dover, Del., testifies (D. Vol. 2, p. 1125), that in 1874 Drawbaugh wanted him to go into it and take an interest in it, but, although he thought it a good thing, yet he declined for the reason that he was living too far away and did not care to invest in it. Mrs. Draper also discouraged him from going into it. (See Mrs. Annie E. Draper, D. S–rej. p. 208, Ans. 2–5.)

JESSE EICHOLTZ, of Dauphin county, Pa., testifies (D. S–reb. p. 154, Ans. 17, 18), that Drawbaugh wanted him to go into it in November, 1873, and when he declined for want of means, asked him to urge it upon his friend, George B. Eyster, which he did.

EYSTER (Id., p. 890), corroborates Mr. Eicholtz's statement.

E. W. CHELLIS, of Harrisburg, Pa. (D. Vol. 1, p. 526), says that Drawbaugh repeatedly urged him to go into it in the early part of 1879, but witness was interested in the faucet and motor business and wished to push it along, and also was aware of the controversy that would arise with the Bell patents, and hence declined (Ans. 11-13.)

Dr. J. W. MOFFITT, of Harrisbugh, Pa., testifies that prior to the centennial year, and from that time on nearly every occasion when they would meet afterwards, Drawbaugh urged him to go into it and get it patented and put into use (Ans. 22, 23), and, if he had not the means, *then to get somebody else to do it*, but witness looked upon it as a mere toy or matter of amusement, rather than as an instrument of any utility. (Ans. 25.) In the latter part of the time witness was afraid of the litigation that would result with the Bell telephone interest (Ans. 28-30), and decided to go into the faucet business instead, which he thought would prove more immediately remunerative. (Ans. 24.)

Dr. MOFFIT's testimony is confirmed, in the Overland case, by the deposition of Col. GEORGE W. HUNTER, owner and proprietor of the Lochiel House, at Harrisburg, Pa., who testifies that Dr. Moffitt came to him and urged him to invest in Mr. Drawbaugh's invention, but he declined. He thinks this was before the centennial. (Add. Proofs, p. 172.)

WILLIAM R. GORGAS, of Harrisburg, Pa., testifies (D. S. reb., p. 1,128) that some time from 1873 to 1877, Drawbaugh came to him and wanted him to take a half interest in some invention—he forgets what—and patent it; but witness had lost about $4,000 in the old faucet and pump company, and "had had a surfeit of it," and, therefore, "didn't pay any attention to it."

JACOB E. SHETTEL, a member of the Clock Company

(D. Vol. 1, p. 212; Ans. 55½, 56, 57), testifies that, although Drawbaugh had urged the value of the talking-machine upon him as far back as about 1873, telling him there was money in it, and that it would be better than telegraphing (Ans. 4), yet he thought the clock of more pecuniary value, and went into that enterprise in preference to the telephone. People around the neighborhood shared the same opinion, and thought the clock a very valuable invention. (Ans. 58, 59.)

HARMAN K. DRAWBAUGH (D. Vol. 1, pp. 557-8) testifies that his uncle Daniel, as far back as 1872, wanted to get some men to go in with him and furnish money to patent the telephone and run the business; and afterwards *often urged witness to try to find such persons for him.* (Ans. 69.)

CAPT. J. A. MOORE (D. Vol. 1, p. 622), a member of the Axle Company, says that in May, 1875, Drawbaugh urged him to go into it, furnish the money to patent it and put it on the market, and offered him an interest in it if he would do so; but witness was engrossed in his own business and declined. (Ans. 23-25.)

WILSON BEAR, another member of the Axle Company (Id., p. 629), testifies that he has a faint recollection of Drawbaugh's offering him an interest in the invention and wanting him to furnish money to patent and introduce it (Ans. 10, 11), while the Axle Company were in business in 1875.

It appears from Christian Eberly's testimony (D. Vol. 1, p. 117) that Drawbaugh was, along about 1871 or 1872, trying to induce *Mr. Lee*, private secretary to Governor Geary, to take an interest in the invention. (Ans. 38-41.)

ELIAS GRAYBILL (D. S-reb. pp. 185, 186) testifies that in the summer of 1875, before September, Drawbaugh asked him to go into the telephone, take an interest, and get it patented. (Ans. 12–20.) Witness came very near doing it. (Ans. 47.)

ORLANDO KAHNEY (D. S-reb. p. 229, Ans. 35--45) testifies that in October, 1875, Drawbaugh tried to borrow seventy-five or one hundred dollars from him to patent the telephone.

ALFRED DITLOW (D. S-reb. p. 820, Ans. 3-6), testifies that prior to 1876 Drawbaugh applied to him for money to take out a patent, but he declined. This was, undoubtedly, for the telephone.

This array of evidence is further confirmed in the Overland case, by the testimony of ORRIS (Add. Proofs, p. 124, Ans. 34, 35), WOODBURN (*id.*, pp. 136–7, Ans. 34, 35), and EMRICK (*id.*, p. 132, Ans. 25), all of whom visited Drawbaugh's shop in July, 1873, just before the meeting of the Democratic County Convention, and saw his telephones, and to whom he made the statement that he had not the means to patent the invention himself, but was expecting pecuniary aid from somebody, possibly Major Snyder or Henry Baylor, both of whom were considering the matter about that time.

Mr. Drawbaugh is an extremely sensitive and diffident man (Moore, D. Vol. 1, p. 624, Ans. 36; H. F. Drawbaugh, *id.*, p. 402, Ans. 49, 50), and he seems to have approached a great many people on the subject indirectly, stating to them the value of the invention, his desire to patent it, his lack of means, and his wish to have somebody take hold of it with him—evidently hoping thereby to induce them to take hold of it themselves or to mention it to others who would do so. Thus he told *D. Balsley* (D. Vol. 1, p. 193), prior to 1874, that he himself had not the means (Ans. 15), but if he could get some person to help him they could make a nice thing out of it (Ans. 16), and that *he had asked his best friends and they had all refused him* (Ans. 17). Drawbaugh said that if he had the means, he would put it through very quick (Ans. 27). Witness did not go into it, because it was a subject unfamiliar to him (Ans. 18). He told his brother, Henry, that he had asked a great many to go in with him (*H. F. Drawbaugh*, D. Vol. 1, p. 403, Ans. 56). He told *W. H. Bates*, at various times, beginning in the summer of 1874, that he wanted to patent the invention (*Bates*, D. Vol. 1, pp. 419–26). In the summer of 1874, he told him that he would get it patented if he had the means, but *he had asked several men to assist him and they just laughed at him* (Ans. 15, 16). "Several times that I was there his mind seemed to be taken up with it; he said he would like to get it patented, but he had not the means to do it; he said he could make a fortune out of it" (Cross-Ans. 23, 24.) "He was talking about getting the talking machines patented; all that kept him from it was that he had not the means of getting it patented; that was his general conversation in all the interviews that we had about it" (Cross-Ans. 42). At first, when he showed witness instrument "C," he said he wanted to caveat it; afterwards, *when he showed him "A," "D" and "E," he said he had the invention perfected*, and wanted to patent it (Ans. 33, 49, 33, 34, 41). He told *Waggoner*, in November, 1874, *that the talking machine was perfected*, and that he was going to get it patented—at the same time showing him instrument "A" (Waggoner, D. Vol. 1, pp. 122–8, Ans. 5, 21, 9, 27–29, 24), *and saying that if he got a patent on it, it would be the first talking machine patent in the world* (Ans. 30). *Fettrow* testifies (Id. pp. 347–60), that in March, 1875 (Ans. 16), Drawbaugh told him that he had not the money to get a patent on it, but had been talking to a couple of men to go in with him and get it patented (Ans. 24). Witness would have gone in with him at that time if he had had the ready money in his pocket (Ans. 25, 89), but felt it his duty first to provide for his family before reaching out too far for other things (Ans. 94). *Hubler* and *Lenig*, who were at his shop together in January, 1874, testified that Drawbaugh told them he had the invention about completed and was ready to have it patented but did not have the means, and would have to find some way to push it through (Hubler, D. Vol. 2, p. 691, Ans. 9; Lenig, Id. p. 699, Ans. 4.) *Dr. Updegraff* testifies (D. Vol. 2, pp. 1082–84–85, Ans. 4, 12, 32) that in April, 1875, Drawbaugh stated to him that *all he wanted then was some one to go into it with him, and put money into it to get it patented*, and then he could talk directly through the wires instead of telegraphing (Ans. 4); that the same remarks were repeated at the visit of May, 1875, at which time the general conversation was on the machine and on his getting some person to go in with him to procure a patent and put it before the people (Ans. 12); and that, at all three visits, April, 1874, April, 1875, and May, 1875, "the great trouble," with Drawbaugh was want of money—"each time he talked about his trouble, that he didn't have the money to patent it." (Ans. 32). When *Sutton* was at the shop, in August, 1873, and asked why he did not get it patented. (*Sutton* D. Vol. 2, p. 1105, Ans. 14, 15), Drawbaugh explained to him that want of money was what prevented. To *Spangler*, in the fall of 1874, he made the same statement (Spangler, D. S.-reb. pp. 456–7, Ans. 29, 35). In the fall of 1877, he told *Kline* that he was too poor to get it patented, but that if he could get some help there was money in it. (Kline, D. Vol. 1, p. 627, Ans. 9.) In the early part of April, 1876, he told *J. G. Landis*, that he would like to patent it, and would, if he could secure the means (Landis, Id., p. 632, Ans. 8); and, six or eight months afterwards, gave him to understand that some person was going to take hold of it with him and furnish the needed assistance (Ans. 10, 14). To *Wolf* he stated in the early part of March, 1875 (D. Vol. 2, p. 674, Ans. 5, 6), that he hadn't the means to get it patented, but was poor (Ans. 9), but that, if he had the means to get it patented, he would be one of the richest men (Ans. 8). *Fisher* testifies (Id., pp. 688–90) that in 1868 or 1869, Drawbaugh told him he was going to bring it to perfection, and was making good progress with it (Ans. 2, 11); and that prior to the year 1875, he showed him instrument "A" and said either that he had made or was going to make application for a patent on it. (Ans. 21.) *Matthias* says (D. Vol. 1, p. 549, Ans. 26) that in the fall of 1877, Drawbaugh, showing him "H" and other instruments, said the invention was all completed, but that he was still improving it and that he would like to have a patent on it but was too poor. In 1878 he made the same remark to *N. D. Shoop* in reference to his poverty, adding that as soon as he could get the means he would have the talking machine patented (Shoop, Id., p. 464, Ans. 7). While *Springer* lived at Milltown, from April 1, 1876, till January 6 or 7, 1877, Drawbaugh said half a dozen times that his poverty prevented him from patenting the invention, but that if he only knew whom he could get to furnish the means he would go in with him. (Springer, Id., pp. 186–7, Ans. 40, 46, 47, 50.) While *Holsinger* lived there, from September 13, 1873, to November 27, 1876, Drawbaugh told him that he would patent the invention as soon as he could get the money to pay for it. (Id., p. 368, Ans. 63.) He would give anybody whom he could trust a fair interest in it, and had applied to people unsuccessfully for assistance (Ans. 64), but he evidently did not consider himself in a condition to borrow money to patent the invention and the improvements on it separately. *Millard* testifies (Id., p. 331, Ans. 72, 73) that Drawbaugh, with the experimenting that he was doing, could hardly make a living in 1874 and 1875, and gave witness to understand that he was too poor to patent the talking-machine, but would patent it as soon as he could secure the means. Drawbaugh made the same statements to *I. D. Kahney* (Id., p. 204, Ans. 41); to *D. W. Smith*, in 1874 (Id., p. 68, Ans. 19–21) and to *Zacharias* (Id., pp. 47–50, Ans. 3, 30, 31).

From this testimony, in connection with that already herein reviewed, the following facts are clearly established, viz.:

1. That, at least as early as the winter of 1874–5, Drawbaugh regarded his invention as completed and perfected, although he realized that other valuable improvements could and would be found out and added to it. (See Hubler, Lenig, Bates, Waggoner, Updegraff, Holsinger, Matthias and others.)

2. That from 1869 to 1880, he was in extreme poverty, in debt, with a large family to support, distressed and impoverished by sickness and death in his family, with no resources but his daily labor, with no employment except the odd jobs that came in from neighbors, and with his mind so absorbed by his telephone work that he was unable to apply himself efficiently to anything else.

3. That when, on a few occasions, he received small sums of money, they were immediately demanded for the payment of pressing debts and for his household necessities, so that at no time did he feel himself able to apply them to the securing of his inventions.

4. That he hoped to be able to interest others in the talking machine, and not only made reasonable efforts to that end himself, but tried to get his acquaintances to bring the matter before their friends; and at times was probably encouraged to believe that his efforts to get others interested were about to be successful.

5. That his efforts to get others to go with him all proved unsuccessful, and oftentimes resulted in subjecting him only to their ridicule.

6. That, when his overtures to others had failed; poor as he was, and hopeless as was his financial condition, he made efforts to borrow the money with which to patent the invention himself, and in that failed also.

The community not only took the same view of his invention that Gardiner G. Hubbard, Thomas Sanders, William Orton and others entertained in regard to the Bell invention when it first appeared, to wit: that it was merely a scientific toy of no financial value, but came to look upon the poor inventor as an enthusiastic "crank," and the knowledge of this fact came bitterly home to him. He testifies (D. Vol. 2, p. 831, Ans. 421, 422, 423), that they ridiculed him, told him that he was believed to be crazy, and that it was so talked at the village store. *Fetrow* says (D. Vol. 1, p. 350, Ans. 27) that the people around Milltown, referring to the invention "called it tomfoolery." *Waggoner* (Id. p. 124, Ans. 23) "laughed at it." *Yetter*, "who hardly knew what electricity meant at that time," "laughed at it." (Id. p. 137, Ans. 21.)

Lory (Id. p. 226, Ans. 8) "thought that Drawbaugh had turned out to be a fool." *Zimmerman* (Id. p. 417, Ans. 26) found *himself* considered crazy, because he believed in it. *Henry F. Drawbaugh* (Id., 401, Ans. 48) testifies that the invention caused people to believe his brother Daniel to be going crazy. *Bates* (Id. p. 420, Ans. 15) says that those to whom Drawbaugh applied for assistance to patent it "just laughed at him." *Rupp* (Id. p. 430, Ans. 34) "laughed at the idea" of its taking the place of the telegraph. *Byers*, the telegraph operator (Id. p. 510, Ans. 6), laughed at the idea of such an invention. *Bricker* (Id. pp. 510–1, Ans. 1) says Drawbaugh told him he was considered crazy, and people were not willing to assist him with money. *Musser* (Id. p. 607, Ans. 2) "thought it was tomfoolery," and would not even listen at the instrument when requested to. His brother, *John B. Drawbaugh* (Id. pp. 583–4, Ans. 64) characterized it as a "foolish thing," and tried hard to persuade him to abandon it and go to work to provide better for his family. *Lenig* (D. Vol. 2, p. 699, Ans. 1) thought it was a humbug. *Updegraff* (Id. pp. 1082–3, Ans. 4) at first doubted—thought Drawbaugh's statements were going too far—knew men sometimes got crazy on inventions, and suspected that he was one of that class; but, after testing the invention, believed in it. *Zearing* (D. S.-reb. pp. 125, 127) at first thought it a humbug (Ans. 29, 32), but, after testing it, changed his opinion (Ans. 39). Mrs. *Brown* (Id. p. 165, Ans. 21) "always made light of it," and Mrs. Drawbaugh joined with her (same Ans). *Sprenkel* (Id. p. 367, Ans. 22) says that the community regarded Drawbaugh as a foolish old man - silly—half-witted—for spending his time on such an invention. *Hosler* (Id. p. 369, Ans. 16) heard Drawbaugh called a "damned fool" for trying to make a talking-machine. *Graham* (Id. p. 1059, Ans. 13) thought Dan and Harry both crazy when Harry told him about it. *Murphy* (Id. p. 1063, Ans. 4) made the same remark as Graham.

Woods (Id., p. 1107, Ans 8) says it was spoken of in the community as "Drawbaugh's crazy talking machine."

Landis (Id., p. 904, Ans. 37) says Drawbaugh remarked that some thought him crazy.

W. W. Snyder (Id., p. 1074, Ans. 36, 39) "had great sympathy for him," and thought he was getting "cranky." The talking machine seemed so ridiculous that he "thought the man was beside himself." And, as we learn from the testimony of Chellis, H. F. Drawbaugh, Holsinger, Fettrow and others (and of Mrs. Drawbaugh herself in the Overland case), his wife opposed him from the beginning to the end, and his brothers tried to discourage him from his work.

Yet all this opposition, ridicule, poverty and discouragement never for a moment moved him to abandon the invention, nor diverted his mind from it. He seemed determined to cling to it, even if, as Mrs. Drawbaugh told Chellis, it should land him in the poor-house. In view of the evidence, no man can have the slightest doubt that if any one of his acquaintances had responded to his appeals for aid, the telephone would have been patented and introduced into public use long before March, 1876, and before the earliest experiments of Professor Bell.

THE COMPLAINANTS' ATTEMPT TO ANSWER THE DRAWBAUGH CASE.

In answer to the overwhelming proof of Drawbaugh's priority of invention, as contained in defendants' record, Vol. 1 and 2, the complainants, after raking the country with their detectives and agents, from the summer of 1880 to the summer of 1883, and spending fourteen months in putting in their so-called rebuttal, offered the court merely an unsupported *theory* and a few inconclusive *inferences*, and asked judgment thereon against the testimony of over a hundred witnesses.

Their *theory* was substantially as follows, viz:

First. That Drawbaugh never invented any telephone prior to Bell's exhibition at the Centennial.

Second. That he derived his idea in some way from Bell; and

Third. That after Bell's exhibition, telephones began to appear at Drawbaugh's shop, in the order substantially as stated by Drawbaugh.

In other words, that the history of Drawbaugh's telephones really commenced in the fall of 1876, instead of 1866.

This theory they attempt to support, first, by the "negative testimony" of from twenty to thirty witnesses who swear that they were at Drawbaugh's shop, or in the neighborhood, at different times from 1865 to the fall of 1876, without seeing or hearing of any telephones there; and, secondly, by the testimony of witnesses who have been at Drawbaugh's shop, or in the neighborhood, since the summer of 1876, some of whom, even then, had no knowledge of any telephones there, and others of whom had such knowledge, but only of the earlier instruments.

This class of evidence we shall refer to as the complainants' "negative evidence." It is weak, and, as a matter of law, entirely inconclusive as against positive testimony; and is, besides, specifically attacked and destroyed by the defendants in their surrebuttal and closing proofs.

Their *inferences* are equally weak, inconclusive and untenable. They consist mainly in the argument that because Drawbaugh did not patent his invention nor introduce it into public use, nor describe it in printed publications, prior to Bell, therefore the court must conclude that he never made it prior to Bell. Whatever force this argument might have in the absence of any explanation of Drawbaugh's circumstances is completely destroyed by the facts set forth in defendants' evidence and herein already reviewed.

The complainants also attacked the dates set forth in the testimony of the defendants' witnesses, Decker, S. Nichols, U. R. Nichols, Stephens, Hamacher and his scholars, Geistweit, G. H. Bowman, Herr, P. C. Zimmerman, Hoffman and Draper; but, with the exception of one of Decker's dates, in no case so as to affect any material fact or date established by said witnesses. Their plan evidently was to disprove the dates set up by a few of the defendants' witnesses, and then try to make up for their failure to shake other witnesses by asking the court to infer that because two or three were in error therefore all were. Whatever force there might have been in this argument was destoyed by their failure to establish the fact that any of the defendants' witnesses were in error as to any material fact or date.

We will consider these matters in the following order, to wit:

First. The complainants' negative evidence and the answer thereto.

Secondly. Their attack upon the dates or facts testified to by particular witnesses for the defendants.

Thirdly. Their argument as to the conclusion to be drawn from Drawbaugh's not patenting the invention, introducing it into commercial use, or announcing it in printed publications, prior to Bell.

I. THE COMPLAINANTS' NEGATIVE EVIDENCE, AND THE ANSWER THERETO.

This evidence and the defendants' reply thereto is fully and carefully analyzed and compared in Appendix C, to which the court is here referred, and which demonstrates the utter unreliability and worthlessness of all this class of evidence, so laboriously introduced to cumber the record in this case. In addition to what is there said, the following comments are appropriate to the subject here:

First. As a matter of law, all such evidence is intrinsically worthless as against affirmative evidence. The legal presumption is always radically and strongly in favor of the affirmative witnesses.

In Starkie on Evidence, Vol. 1, p. 516, section 32, the law is stated as follows:

> "If one witness were positively to swear that he saw or heard a fact, and another were merely to swear that he was present, but did not see or hear it, and the witnesses were equally faithworthy, the general principle would, in ordinary cases, create a preponderance in favor of the affirmative; for it would usually happen that a wit-

ness who swore positively, minutely, and circumstantially to a fact which was untrue, would be guilty of perjury, but it would by no means follow that a witness who swore negatively would be perjured, although the affirmative were true; the falsity of the testimony might be attributed to inattention, mistake, or defect of memory; and, therefore, even independently of the usual presumption in favor of innocence the probability would be in favor of the affirmative. If, for instance, two persons should remain in the same room for the same period of time, and one of them should swear that during that time he heard a clock in the room strike the hour, and the other should swear that he did not hear the clock strike, it is very possible that the fact might be true, and yet each might swear truly. It is not only possible, but probable that the latter witness, though in the same room, through inattention, might be unconscious of the fact, or, being conscious of it at the time, that the recollection had afterward faded from his memory. It follows, therefore, by way of corollary to the last proposition, that in such cases, unless the contrary manifestly appear, the presumption in favor of human veracity shall operate to support the affirmative."

In *Stitt* v. *Huidekopers*, 17 Wall., 354, 394, the Supreme court of the United States held as follows:

"The court charged the jury, 'that it is a rule of presumptions that ordinarily a witness who testifies to an affirmative is to be preferred to one who testifies to a negative, because he who testifies to a negative may have forgotten. It is possible to forget a thing that did happen. It is not possible to remember a thing that never existed.'

"We are of opinion that the charge was a sound exposition of a recognized rule of evidence of frequent application, and that the reason of the rule, as stated in the charge, dispenses with the need of further comment on it here."

In Gilbert on Evidence, edition of 1805, p. 140, the rule is stated as follows:

"One affirmative witness countervails the proof of several negative, because the affirmative may swear true and the negative also; for the negative may commonly be that they know not of the matter; the affirmative swears that is, and so the affirmative may be true and the negative also; for the thing that one swears may be true, though the other knew nothing of the matter."

In *Chambers & Yatman* v. *The Queen's Proctor*, 2 Curteis, 415, Sir Herbert Jenner says: "Upon general principles, affirmative is better than negative evidence. A person deposing to a fact which he states he saw, must either speak truly, or must have invented the story, or it must be sheer delusion. Not so with respect to negative evidence; a fact may have taken place in the very sight of a person, who may not have observed it, or if he did observe it may have forgotten it."

In this case, of three attesting witnesses to a will, two deposed that the testator did not sign the will in their presence, and the other, that he did. The court, Sir Herbert Jenner, held, on this proof, that the will was signed in the presence of the three witnesses.

In *Kennedy's Heirs* v. *Kennedy's Heirs*, 2 Ga., 571, p. 616, the court says: "The testimony of a witness who speaks positively to a fact is entitled to more consideration than several witnesses whose statements are merely negative." Of the former character is the evidence of the Dolines and most of the witnesses who sustain them —while the greater number of those who testify in opposition to them merely state that they were well acquainted with William (the grantor) "and Joshua Kennedy" (the grantee)—"never heard them say that the deed of 24 was intended to secure the property conveyed to the children of the former; that, had such been their intention, they believe they would have heard it. Such evidence is too loose and inconclusive to overthrow the positive declarations of respectable witnesses." In this case, the court held a deed which was absolute on its face to have been made in trust for the children of the grantor.

See, also,

Purviance v. *Angus*, 1 Dallas (Pa.), 180.
Ralph v. *R. R. Co.*, 32 Wis., 178.
Gorham v. *Peyton*, 2 Scam. (Ill.), 363.
Delk v. *State*, 3 Head. (Tenn.), 79, 81.
Matthews v. *Poythress*, 4 Ga., 287, 295.
Seibert vs. *R. R. Co.*, 49 Barb., 583.
Hepburn v. *Bank*, 2 La. Ann., 1007.

And many other cases. In *Seibert* v. *R. R. Co.*, the court characterized negative evidence very strongly. Certain witnesses swore that the bell of the engine was rung, and other witnesses swore that, although present, they did not hear it. The court said that the negative testimony was only "*the slighest possible evidence, scarcely* "*sufficient uncontradicted to take the case to the jury.*" Yet this is the kind of evidence upon which the complainants rely to overthrow the vast accumulation of positive proofs on the part of the defendants.

Second. It is evident from the language of the authorities, that, for such evidence to have any weight at all, the negative witnesses must greatly outnumber the affirmative. The testimony of a single affirmative witness outweighs that of several negative. But, in this case, on the contrary, the affirmative witnesses enormously outnumber the negative. We have already seen that one hundred and ninety-seven persons testify to knowledge of Drawbaugh's talking machines prior to February 14, 1876, of whom one hundred and twenty-six actually saw the machines, and over sixty heard talk through them, or were present when others were successfully talking through them. To meet this array of proofs, the complainants gravely rely upon the fact, that, by searching several counties of Pennsylvania and four other states of the Union, forty-five persons could be found, some of whom were not in Drawbaugh's shop for years at a time, others never there after 1870 or 1872, others never there till 1877 or later, others never there except for some brief errand which they accomplished and then went away, and others hostile to him, who concur in stating that they either never saw or knew of his talking machines prior to 1876 or, if they did, have forgotten the fact! Such stuff is unworthy the serious consideration of the court, even if were uncontradicted, which it is not.

Third. Out of the forty-five negative witnesses, a large number, as will be seen from Appendix C, immediately contradict their own negative evidence. *William Darr*, who moved away from Milltown in the spring of 1870, but was introduced to swear that he never saw or heard of the talking machine, was obliged to testify, on cross-examination (see p. 130, *ante*), that Drawbaugh was talking to him about conversing across the Atlantic Ocean, prior to his removal from Milltown. *Abraham Ditlow*, who testified that he first knew of Drawbaugh's talking machines in March, 1877, was afterwards able to positively fix the date as far back as 1874. *Joseph Ditlow*, who testified that he first knew of the talking machine in March, 1877, upon reflection was convinced that he had known of the invention many years before that date. *Jacob Evans*, who testified that he first knew of it in 1877, subsequently remembered and testified positively to seeing it and talking through it about December 1, 1875. *Orlando Kahney*, who testified that he first knew of it about 1876 or 1877, had hardly arrived home in Illinois before he remembered seeing it as far back as 1875, and remembered seeing the circuit wires as early as 1873, and immediately wrote both the complainants' agent and counsel, desiring to be allowed to return and correct his testimony; but his request received no attention from them. Upon recall by the defendants, he testified to hearing talk through Drawbaugh's machines in July, 1875, and from his description of the instrument used by him as a receiver, it was undoubtedly "D" or "E."

William Natcher, never at Drawbaugh's shop after August 9, 1872, testified that Drawbaugh did not tell him of the talking machines while witness lived at Milltown; but, on recall by defendants, swore positively to having heard of them from others prior to August 9, 1872. *Michael H. Natcher*, never at Drawbaugh's shop after August 9, 1872, testified that he never saw Drawbaugh's talking machines while he lived at Milltown; but, on recall by defendants, declared that he had heard of them frequently while he had lived at Milltown.

These seven witnesses of the complainants prove, first, that prior to 1871, Drawbaugh was talking about transmitting speech across the Atlantic Ocean; secondly, that prior to August 9, 1872, his talking machine was a matter of common notoriety in Milltown and vicinity; and thirdly, that Drawbaugh's perfected machines were seen and successfully talked through by them in July, 1875, and about December 1, 1875. *Their testimony not only does not prove a negative, but, in fact, it overthrows the entire structure of negative evidence so carefully built up by the complainants, and it substantially proves the defendant's case!*

Fourth. Of the said forty-five negative witnessrs, twenty-three, to wit: *William Darr*, *Jacob Carns*, *Cyrus Bowman*, *Abraham Ditlow*, *Joseph Ditlow*, *Jacob Evans*, *Amos Frownfelter*, *William Frownfelter*, *Theodore Gris-*

singer, *Daniel Hart*, *Samuel F. Hauck*, *John F. Hursh*, *Orlando Kahney*, *Benjamin Kauffman*, *George W. Kissinger*, *George W. Mumper*, *Michael H. Natcher*, *William Natcher*, *J. C. Nesbit*, *E. M. Nichols*, *Henry S. Rupp*, *Geo. W. Rowe* and *William Sadler*, stand specifically rebutted by the evidence, as will be fully seen by reference to Appendix C. It was only after the defendants had completely disproved the negative testimony of the Ditlows, Evans and Kahney, that those witnesses were allowed to come back on the stand and correct their former statements.

Of the remaining twenty-two negative witnesses, nine, to wit: *M. J. Bailey*, *Geo. W. Heiges*, *Keifer*, *C. A. Landis*, *I. D. Landis*, *Rufus E. Shapley*, *Matthews*, *H. R. Mosser and Worley*, appear to have never been in Drawbaugh's shop till after the summer of 1876, and hence can give no evidence as to what was or was not in that shop prior to that time. This leaves but thirteen, out of the entire forty-five, to comment upon at this point. Of these thirteen *David A. Hauck* is shown, upon cross-examination, to have had a controversy with Drawbaugh in a patent-office interference, in the course of which it was proved that he attempted to steal Drawbaugh's faucet invention, and perjured himself to sustain his theft, and that he was adjudged by the patent office to have deliberately sworn to a gross and material falsehood in said proceeding, and his evidence was consequently disregarded.

Theophilus Weaver is shown upon cross-examination to be a disreputable shyster, employed by the complainants to assist in hunting up evidence against Drawbaugh before going on the witness stand, strongly prejudiced against the defendants, and to have contradicted himself in important particulars, so that his testimony is totally unreliable. The testimony of *Cyrus Kissinger*, *George F. Kissinger* and *George W. Kissinger*, *John M. Kissinger* and *J. C. Zimmerman*, all members of one family, is shown, by their record in the ram matter (see Appendix A), to be at least very questionable, if not altogether discredited, and is contradicted by William Natcher, who heard old Mr. Kissinger (George W.) speak of Drawbaugh's talking machine prior to August 9, 1872.

Of the entire number of negative witnesses, we have, therefore, only seven left, viz.: Harro, Lloyd, Major, Henry Neidig, Jacob Neidig, A. L. Rupp and George C. Rupp, who were at the shop prior to October, 1876, whose negative testimony is uncontradicted, and whose character is unimpeached by the evidence in the case.

Of these seven witnesses *Harro* is an unintelligent farm laborer, who worked at Samuel Hertzler's near Milltown from March 1, 1875, to March 1, 1877, and was occasionally in Drawbaugh's shop during that period, and testifies that he never saw nor heard of the talking machine. The best commentary that can be made on his evidence is that, *by the complainants' own proofs* (see testimony of Shapley and I. D. Landis), *the talking-machine was certainly there during a considerable portion of that time, and at least as early as October* 3, 1876, *and Drawbaugh had been talking through it, and was very enthusiastic about it.* It follows, therefore, that this witness' ignorance of its existence is, by the complainants' own showing, utterly inconclusive and immaterial. The invention was admittedly there, but he did not know it, or has forgotten it—probably the latter. *Major* is a man who worked for the Haucks, making faucets at Drawbaugh's shop, about one month in the summer of 1874. Witness did his work in the lower story of the shop, while Drawbaugh occupied the upper story. He was never in Drawbaugh's room but once (Ans. 22), at which time he saw things the character of which he did not know (Ans. 44). He did not even know where the faucet strainers were made (Ans. 14), although it is elsewhere in evidence that they were made on the same floor occupied by Drawbaugh (C. Vol. 1, p. 808). And, finally, he frankly admits (Ans. 40, 41), that his memory of events is very unreliable. It is obvious that the failure of such a witness to recollect the talking machines is not evidence.

Abraham L. Rupp and George C. Rupp were occasionally at Drawbaugh's shop, although they lived about two miles distant. Their visits appear to be infrequent, and usually on some errand, such as to grind knives, etc. They were there, separately, in the winter of 1877–8, and both of them saw and talked through the telephones there that winter, and they say that was the first knowledge they had of them. *There is, however, no evidence that either of these two witnesses was in that shop for many years prior to that winter.* One of them (C. Vol. 2, p. 1125, was asked whether he could swear that he had ever been there in the five years preceding that time, and answered (Ans. 32) that he could not swear that he had. Although they lived together, neither of them felt interest enough in a talking machine to mention to the other that he had seen it or talked through it (pp. 1126–27), and, until they testified, did not know of such fact. (p. 1127. Ans. 52.) When A. L. Rupp saw and talked through it, he took no interest in it and asked no questions about it. (pp. 1118–1119. Ans. 70–77.) He could not identify the instrument which he saw and listened at, but George identifies "A" as the one which was used when he (George) was there. (p. 1124.) It is perfectly manifest that the negative testimony of such witnesses is absolutely worthless.

The negative testimony of *Henry Neidig* and *Jacob Neidig*, father and son, is almost equally worthless. *Henry Neidig does not even state that he ever was in Drawbaugh's shop in his life.* He lived one or two miles away, and, when he had any errand at the shop, was in the habit of sending others, generally his son, to attend to it. (C. Vol. 2, p. 1526, Ans. 57.) When asked by complainants' counsel if his son was observant of, and interested in, mechanical matters, he gave the peculiarly guarded and suggestive answer (p. 1526. Ans. 58) that he was "*to a certain extent!*" The son says he was at the shop a good many times between the spring of 1870 and the fall of 1874 (C. Vol. 2, pp. 1236–7, Ans. 17), was there, but not as often as before, from the fall of 1874 to the spring of 1876 (Ans. 19), was there but seldom between the spring of 1876 and the spring of 1877 (Ans. 20); and never was there afterwards. (Ans. 21.)

In answers 108, 109, 113, 114, 117, etc., he says he cannot remember being there after the very early part of the year 1876. He began to learn his trade in Shiremanstown, in the fall of 1874 (Ans. 64), and it is probable that he was at Drawbaugh's shop very seldom after that date, as his occupation at Shiremanstown would be likely to keep him away.

When at the shop, from 1870 to 1874, he was generally on errands. (Ans. 18.) He could not testify that he ever saw an electric clock there prior to the summer of 1875 (Ans. 173); although it is abundantly established by both complainants and defendants that such clocks were there from 1870 to the present time. He says he never saw nor knew of Drawbaugh's talking machines, and thinks (Ans. 177) that he would not have forgotten them, because he remembered things of less importance. *He is the only witness, of all whom we have commented upon, whose negative testimony is of any value*, and how little even his testimony is worth can be judged from the fact that it would equally negative the clocks prior to the summer of 1875, although they were admittedly there all the time for many years before that date, and were, of course, much more conspicuous objects than the talking machines. *Isaac Lloyd*, of Harrisburg, was at Drawbaugh's shop twice in 1866 or 1867, on a business errand, before the shop was moved into the old clover mill (C, Vol. 2, p. 1265, Ans. 10), and again with Worley, in February, 1878 (Ans. 52), to see the electric clocks. Between 1867 and 1878, he was there two or three times, to wit: once, about 1871 or 1872, to see the nail feeder (Ans. 80-81) and twice (about 1875, 1876 or 1877—see Ans. 72-77), to get a lens ground. He never saw any telephones there, and until his visit of February, 1878, (the last time he was ever there—Ans. 71) did not hear of them. He thinks he got the lens ground in 1877 (Ans. 72, 73), but, if such was the fact, the telephones were certainly there at the time, although he does not remember them. (See testimony of complainants' witnesses, Shapley, Landis, A. Ditlow, J. Ditlow, O. Kahney, and others, who establish that fact.) That the witness did not see or hear of the telephones when he went to see the nail feeder in 1871 or 1872, is not remarkable. The nail feeder was kept in the basement (See Kahney, C. Vol. 3, p. 2038, Ans. 32; Nichols, C. Vol. 1, p. 854, Ans. 21) while the telephones were ordinarily kept in the second story above. It does not appear that Drawbaugh was present, nor that the witness went into the upper part of the building, nor that he did anything but look at the nail machine and go away. His two visits to the old shop near the grist mill in 1866 or 1867, were on business errands, and there is no significance whatever in the fact that he was not then shown the talking machines. Geo. B. Eyster (D. S-reb. p. 891, Ans. 4) testifies that, at that early period, Drawbaugh did not want everybody to see the talking machine, which was then incomplete and experimental. The only visits of this witness, therefore, at which he might reasonably be expected to have learned of the talking machines, were in 1877, when they were admittedly there, and February, 1878, when they were talked about although not shown. Such negative evidence fails to be of any force whatever.

This exhausts the entire list of negative witnesses examined by complainants in their rebuttal. The complainants evidently came to the conclusion, after finishing their rebuttal, that their negative evidence needed strengthening up, and, in the course of the year following, they found three additional persons sufficiently ignorant or forgetful of the facts to serve their purpose, and called them while putting in their evidence in rejoinder. Of these three persons, *John Kahney*, *George Ditlow* and *Simon C. Wilson*, Kahney, an old man, testified that although he was at Drawbaugh's shop a good many times he never saw or heard of the telephones which his four sons, Norman, Ira D., Orlando and Augustus, all saw, and several of them talked through prior to Bell's invention, while neither Ditlow, who lived at Camp Hill, nor Wilson, who lived in Harrisburg, appear to have ever been inside of Drawbaugh's shop in their lives, but can only testify to no recollection of having heard of the talking machines which were there.

Both under the rule of law above stated and also as a matter of simple common sense, the entire negative testimony of the forty-eight witnesses examined by the complainants to prove that there were no talking machines at Drawbaugh's shop prior to Bell's invention, would not rebut the affirmative testimony of a single credible witness who saw and talked through them.

Fifth. The complainants, in the very act of putting in their negative evidence, demonstrated its utter worthlessness. They proved by numerous witnesses that Drawbaugh had talking machines that were seen in 1876, 1877 and 1878, and were talked through and were even referred to in the newspapers, and then called witnesses to swear that they never heard or knew of them till 1880. (See William Sadler, C. Vol. 1, p. 1041, Ans. 45; Daniel Hart, Id. p. 1515, Ans. 24–28.) And yet those witnesses express, just as positively as the others, their opinion that he could not have had talking machines there without their knowledge. Other witnesses, such as Bailey, the Frownfelters, Grissinger, George W. Heiges, John F. Hursh, Mumper, Mosser, Nesbit, A. L. and Geo. C. Rupp and Weaver, say they never heard of them until about the latter part of 1877 or some time in 1878, although the machines were confessedly there long prior to those dates. These facts alone, when properly considered, show that negative evidence is utterly unreliable and inconclusive, and strongly commend the wisdom of the courts in classing it as the lowest species of evidence, inadmissible to rebut positive affirmative testimony.

Sixth: A great many facts appear in the case which curiously emphasize the worthlessness of negative evidence. Take, for one example, the testimony of J. C. Nesbit (C. Vol. 1, pp. 687–706). He was at Drawbaugh's shop in July or August, 1878, with one Hull (who died in the spring of 1879), to procure materials for a historical sketch of Milltown to be published in Wing's History of Cumberland County, and was called to prove that Drawbaugh did not mention the telephones. In connection with his testimony the complainants introduced the history containing a brief sketch of Milltown and even of Drawbaugh's shop, but silent as to telephones. In cross-examination, however, the defendants produced a manuscript made by Hull at that very visit, which conclusively showed that Drawbaugh *did* mention the telephones—both carbon and magneto—as his invention; and, upon the defendants' demand, the complainants were obliged to put in another copy of the same history, which was printed at the same time with the copy they first introduced, and which contained, in an appendix, the substance of Hull's manuscript statement about Drawbaugh's telephones! Here was shown, not only a reprehensible effort on the part of the complainants to deceive the court by introducing an incomplete book, but also an unanswerable rebuttal of the witness' negative testimony by means of a writing made during the very interview which formed the subject of his deposition. How many such witnesses as this would suffice to overthrow the positive testimony of one credible person! And who can say that the testimony of any one of the negative witnessess is more reliable than that of Nesbit? He is an intelligent and honest man, and was testifying to a visit of comparatively recent date; so that, had it not been for the annihilating manuscript, his testimony would have carried more weight than that of any other of the complainants' negative witnesses. As it stands, however, it is not only ruined, but, in its ruin, beautifully exposes the fallacy of the whole mass of negative evidence introduced in this case, and also exposes the questionable methods of the complainants. The defect of this kind of evidence is radical, and does not depend on the character of the witnesses. It is an attempt to establish facts by what people do not remember, and the more worthless the memory is, the better it serves the purpose.

Seven. The complainants' negative evidence, feeble as it is, is the best that they could gather by carefully selecting such as would answer their purpose and rejecting all other. For example, when *John A. Smith* recommended their agent, Comfort, to see Abraham May, as a person likely to know something of Drawbaugh's talking machines, Comfort's reply was that "*that wasn't the kind of evidence he wanted.*" (D. S-reb. p. 1117, Ans. 28.) So, too, when some of complainants' attorneys interviewed *Draper*, before the defendants even knew of his existence, and were assured by him that he had seen and talked through Drawbaugh's machines as early as 1874, the attorney promptly told him that he needn't be uneasy about being called away as a witness, as they should not want him! (Thos. Draper, D. Vol. 2, p. 1130.) *Jonathan Fry* was sought by Comfort, but when he told what he knew, he was no longer considered a desirable witness. (Fry, D. S-reb. p. 333.) Comfort also interviewed *Barber*, but having learned that he would be a positive, instead of a negative witness, had no further use for him. (Barber, D. S-reb. p. 375.) He also interviewed *Eicholz*, and, for the same reason, rejected his testimony. (Eicholz, D. S-reb. p. 155.) *Mrs. Spangler* told Comfort that she had seen the talking machines while her family lived at Milltown prior to August 9, 1872, and the complainants did not call her. (Id. p. 177.) *Graybill* was rejected by the complainants for a similar reason. (Id. p. 189.) It is evident that the truth was not wanted, but they were merely searching the community for persons who could be used to mislead the court. This one fact of their carefully sifting out and rejecting all who had any knowledge on the subject, ought to condemn their whole work.

Facts of the same character also appear in the Overland case, and place the complainants even in a worse light. The case of the Peoples' company was argued and submitted about the 1st of October, 1884. The evidence in the Overland company's case was not completed for several months thereafter, during which time much additional evidence was taken relative to Drawbaugh's invention, as we have already seen. In the argument of the People's case, Mr. Storrow, in words quoted in full (Add. Proofs, p. 142), made a savage assault upon the defendant for not having called as a witness, *David Stevenson, Jr.*, in the course of which he said:

"If there was a telephone there he must have known everything about it, but they do not put him on the witness stand. I do not need to argue the importance of that line of conduct. When you come to read the brief you will find case after case with comments upon the conclusive effect, under such circumstances, of the failure to call a witness by the party upon whom the burden, and upon whom a very heavy burden rests." *And yet Mr. Storrow knew when he uttered those words, that Mr. Stevenson if called, would have been a good witness for defendants*, for his agent, Comfort, had long before been informed by Mr. Stevenson that such was the fact. (See Add. Proofs, p. 149). And Stevenson's evidence alone ought to be conclusive of the case. (See Add. Proofs, pp. 141–155; 164–171.

So, also, the complainants' counsel in the court below, animadverted severely upon the defendants for not having called and examined more of the workmen of the old Faucet Company, and argued that our failure to do so, was evidence that such workmen would testify against us if called. But in the Overland case subsequently, two of those workmen, *Joseph H. Gregory* and *Emanuel K. Gregory*, of Taunton, Mass., were called and examined for defendants, and they testified not only to knowledge of Drawbaugh's telephones prior to December 5, 1870, *but that they had both informed Mr. Storrow's agent, Tompkins, of that fact several years before their examination as witnesses.* (Add. Proofs, pp. 184, 192, 193.)

We leave the court to make its own comments upon the course pursued in these matters by the complainants' counsel.

Complainants' counsel in the People's case below also commented harshly upon the fact that defendants had not called *Mrs. Drawbaugh* as a witness. In the Overland case she was subsequently called and examined, and her testimony not only establishes the successful use of the telephone in the summer of 1872, but sustains every part of the defense. (Add. Proofs, pp. 221–233).

Eight. In conclusion, so far as this topic is concerned, we may briefly recapitulate as follows: First, a majority of the negative witnesses are proved positively to have been looking at, or talking about, Drawbaugh's talking machines long prior to the dates fixed by them as the time of their earliest knowledge of such machines; secondly, of the remainder, a majority were never in Drawbaugh's shop until after the summer of 1876, and therefore cannot establish what was or was not there before that time; thirdly, of those who were there after the summer of 1876, a goodly number establish the fact that he had talking machines at least as early as October 3, 1876, and from that time onward; fourthly, yet others, in the same period, were utterly ignorant of such machines being there, and tend to negative the existence of the machines as strongly after October 3, 1876, as before that date; fifthly, a considerable number of the negative witnesses returned to the witness stand and testified positively to having seen and heard, and some to having talked through these machines prior to the date of Bell's invention; sixthly, the testimony of some of the negative witnesses is manifestly biased and unreliable, and one of the most important of them stands contradicted by a paper written during the very visit which he made to Drawbaugh's shop; seventhly, the affirmative witnesses outnumber the negative, more than four to one; eighthly, the negative witnesses do not represent the voice of the community, but were carefully sifted out by complainants' agents and attorneys; and, lastly, the rule of law condemns the whole class as incompetent to meet the testimony of affirmative witnesses who testify to facts within their own knowledge and memory.

We are justified, therefore, in asking the court to dismiss the complainants' negative evidence as utterly worthless—to lay it out of consideration altogether, as too trivial to be dignified by the further attention of a tribunal seeking for the truth.

2. THE COMPLAINANTS' ATTACKS UPON THE DATES OR FACTS TESTIFIED TO BY PARTICULAR WITNESSES FOR THE DEFENDANTS.

Out of the one hundred and ninety-seven witnesses who establish the date of Drawbaugh's invention as prior to February 14, 1876, the complainants have made a lame and impotent attempt to shake the dates of about a dozen, to wit, Decker, S. Nichols, N. R. Nichols, Stephen, Hamacher and his scholars, Geistweit, G. H. Bowman, Herr, P. C. Zimmerman, Hoffmann, Jacob Evans, Draper, and one or two others.

If we should lay all these witnesses out of consideration altogether, the dates and facts as to Drawbaugh's priority over Bell would still remain incontestibly established by more than one hundred and seventy-five credible witnesses, very many of whom were never at the shop after June 1, 1875, and, therefore, could not have confounded earlier with later dates. We might, with reason, dismiss the whole matter with this single commentary; but, in order that the court may fully understand the utter insignificance of complainants' efforts to meet our case, we shall briefly discuss this attempted specific rebuttal, which, in most instances, will be found simply farcical and ludicrous.

For example: (*Geistweit* D. Vol. 1, pp. 457-62) testified that he went to work to repair Musser's mill at New Cumberland, in June, 1870 (Ans. 3-12), and during the job worked "at millwrighting" (Ans. 2); that, after the millwrighting job was done, he worked in the mill about a year and a half (Ans. 5); that, while repairing the mill, he had occasion to use a ratchet-drill to bore an iron shaft, and went to Drawbaugh's shop at Milltown, to borrow one (Ans. 9–11); and that, on a visit to borrow the ratchet-drill he first saw and plainly heard talk through Drawbaugh's talking machines, "B" and "F." (Ans. 13–22.) He further testified that he was never at the shop after the fall of 1876 (Ans. 25), but that during the period from the summer of 1870 to the fall of 1876 he also saw Exhibit "D" or "E," or both (Ans. 26, 27), and probably "H" (Ans. 30, 31). To meet this evidence, complainants call Henry R. Mosser, who swears that the repairs on his mill began on June 26, 1871 (C. Vol. 1, p. 370, Ans. 26), at which time Geistweit commenced to work for him (Ans. 27), and worked about a year and a half (Ans. 31, 34), and that Geistweit helped to repair the mill in 1871 (Ans. 36), but he "never knew him as a millwright" (Ans. 23). *Now, Geistweit never testified that he was a millwright*, but only that he "worked at millwrighting" during that particular job, his general business being that of steam engineering. He erred just one year in the date of the job, which is a perfectly natural error after the lapse of more than ten years; and it is utterly immaterial whether his visit to Drawbaugh's shop was in July, 1870, or July, 1871—it was, at least, four years prior to Bell's invention, in either case. The materiality and force of Geistweit's testimony are not shaken in the least. *John H. Stephen* (D. Vol. 1, pp. 248–53), testifies that prior to 1875, and, he thinks, as early as 1870 (Ans. 3–6), he was at Drawbaugh's shop and first saw the talking machines there (Ans. 5–15); that, in 1875, he saw "D" or "E" (Ans. 17); and that, in 1876, he saw "C" (Ans. 15–16). He also testifies that when he first saw the talking machines he told his family on his return home (Ans. 18–20), and that he described

"B" and "F" to defendants' counsel before they produced the exhibits for his inspection. (Ans. 42.) To meet this evidence, the complainants call George W. Row (C. Vol. 2, p. 1533), who testifies that he worked as a laborer for Mr. Stephen in 1876 (Ans. 1–11, 27), when he was sixteen years old, and that in October, 1876, Mr. Stephen told him that Drawbaugh was making a talking machine (Ans. 12–24), but didn't tell him that he had recently seen it (Ans. 79), nor that he had not seen it long before that time (Ans. 80), nor that that was the first talking machine Drawbaugh had made (Ans. 81), nor that Drawbaugh had not told him of the talking machines long before that time (Ans. 82). All that Stephen said to witness was as follows:

> "The first he asked me whether I had heard about Dan. Drawbaugh's talking machine; I told him I didn't. Then he said that Dan. had told him last evening that he was making a talking machine, to talk from one place to another by a wire. *That was all that was said about it; if anything else was said about it I don't remember.*" (Ans. 78.)

Of course, this does not establish even a doubt as to the correctness of Stephen's testimony; but shows the absurdity of the stuff the complainants were attempting to use in "rebuttal." The defendants called Henry Otstot in surrebutal, who testified (D. S-reb. pp. 361, 362) that he was at Drawbaugh's shop with Mr. Stephen in 1870 or 1871, when Drawbaugh showed them his talking machines (Ans. 10-16); and that the last time when witness was ever at said shop was on the day of George B. Heck's sale (Ans. 1-10), which was on September 13, 1873 (J. B. Heck, D. S-reb. pp. 892-3). Witness never was there except on those two occasions (Ans. 2), and, on one of them, saw Exhibit C. (Ans. 25.) The result of the complainants' efforts here is, that, first, Mr. Stephen is not contradicted by their witness, and, secondly, that he is positively confirmed and his testimony materially strengthened by Otstot.

The attempt to rebut *Hamacher* and his scholars, *John F. Rupp* and *S. S. Rupp*, together with the neighboring schoolmaster, *Strong*, is equally weak and farcical. *Hamacher* testified (D. Vol. 1, pp. 289-310) that on the first day of February, 1876, he took certain of his pupils of the Cedar Run school and went with them to Robert J. Strong's school at the Gorgas school-house, and thence to Drawbaugh's shop .(Ans. 4-11, 116-124), where a number of talking machines were exhibited to them (Ans. 14), and, among others, Instrument "A." (Ans. 13.)

He produced (pp. 313, 314) the official report book of Mr. Strong's school, which contained an entry of the visit on February 1, 1876. He testified (Ans. 46-50) that he visited Drawbaugh's shop on that occasion to see the talking machines, which were at the time a matter of common talk in the community, and of which he had often spoken with John F. Rupp, one of his pupils. On the first day of February, 1876, his school held no session, and he gave as the reason for its not being in session that new desks were being put in. (Ans. 9.) *John F. Rupp* (D. Vol. 1, p. 311) corroborated Mr. Hamacher's testimony in every important particular, including the visit to Strong's school (Ans. 20), the visit to Drawbaugh's shop (Ans. 3-19), the date (Ans. 3), and the exhibition of the talking machines, (Ans. 9-18), among which he identifies "A" and "F." (Ans. 10-14). He was a pupil of Hamacher's, and quit schooling in the latter part of February, 1876, when he was a few weeks over twenty-one years old (Ans. 4–7), and he never attended a common school afterward (Ans. 8). It is, therefore, upon his evidence, absolutely certain that the visit was not later than February, 1876. He also testifies that he had heard of Drawbaugh's talking machine before the visit (Ans. 28); that he had talked to Mr. Hamacher about it before the visit (Ans. 27); and that he never was at Drawbaugh's shop since that day. (Ans. 32.) *S. S. Rupp*, another of Hamacher's pupils (D. Vol. 1, p. 572), confirms the visit to Strong's school and thence to Drawbaugh's shop, and the talking machines there. (Ans. 1.) *Robert J. Strong* (D. Vol. 1, pp. 375–81), referring to books of his school, which show the date of Hamacher's visit with the Rupps and others on February 1, 1876, testifies to his memory of the visit (Ans. 21, 22); says that Hamacher told him he was going from there to Drawbaugh's shop (Ans. 24); that Hamacher and John F. Rupp called at his school on their return from Drawbaugh's shop that afternoon (Ans. 25), and told him they had seen the talking machine there (Ans. 26). And he further states that Drawbaugh had shown him (Strong) the talking machine in November, 1875 (Ans. 7–17), when he went there to get a gun repaired (Ans. 7), and that he got his gun a few days afterward (Ans. 18), and has never been there since. (Ans. 19).

The report book of Mr. Strong for January and February, 1876, is copied into Defendants' Exhibits, pp. 12–15, and the record of Hamacher's visit with his scholars is shown at the lower left-hand corner of p. 15. Here is the positive, concurring testimony of four unimpeached witnesses, with a contemporary public township record fixing the date with the additional fact that *John F. Rupp* was twenty-one years of age in February, 1876, and hence became disqualified to attend the public schools thereafter, and never again did attend them, and with the witnesses also testifying to the date as a matter within their own memory. To rebut this conclusive proof, the complainants examine *George W. Mumper*, one of the school board (C. Vol. 2, pp. 1109, 1110), to show that the new desks were put into Hamacher's school-house between December 26, 1874, and May 22, 1875. The legal effect of this fact would be, *not to negative the visit of Hamacher and his scholars to Drawbaugh's shop and their inspection of the talking machines there*, but to show merely that either the interruption of Hamacher's school on February 1, 1876, was occasioned by *some other matter* than the putting in of the desks, or else that the visit *was a year earlier than the defendants' witnesses alleged!* From the instruments "A" and "E," identified by Hamacher and Rupp, the latter might have been the true explanation, as those instruments are proved to have been in existence prior to December 24, 1874; but Mr. Hamacher, on recall by the defendants (D. S. reb., pp. 519, 520), explained and showed from the school record that he and his scholars visited the Gorgas school on January 4, 1875, *where Mr. Eichelberger was then teaching*, which he stated was on the occasion of his own school being interrupted to put in the desks, and that he again visited it with his scholars on February 1, 1876, when Mr. Strong was teaching, on which occasion his school was interrupted by the leakage of snow and water through the roof; and he is fully confirmed by John F. Rupp, recalled (D. S.-reb., p. 517), whose diary contained an entry of the first visit to the Gorgas school. He had made a very natural mistake on an entirely irrelevant matter, to wit, the reason *why* his school-house was vacated on that day, but he had not mistaken the date of his visit to Strong's school and Drawbaugh's shop, nor the fact as to what was seen at the latter place. The testimony of Mumper only served to emphasize the fact stated by Strong in his answer 5, p. 375, *that he taught the Gorgas school only from September 13, 1875, to March, 1876,* so that the date of Hamacher's visit to Drawbaugh's shop, going from and returning to Strong's school in the Gorgas' school-house, became even the more strongly corroborated.

The complainants' attack upon the date fixed by *E. B. Hoffman,* and the defendants' conclusive answer to it, involve so long a discussion that we have given it separate consideration in Appendix B, to which the court is here referred, and from which it will be seen that Hoffman is conclusively confirmed both as to his visit to the shop and its date, and that the attack only served to materially strengthen his evidence in defendants' favor.

The same commentary may be made concerning their attack upon *Draper's* date, which is fully considered in Appendix A, and his date shown to stand entirely unimpeached.

One G. H. Bowman, a miller, testified (D. Vol. 1, pp. 466–70) that in February, 1876, he was doing some millwrighting for his brother, Cyrus Bowman, at the Eberly grist mill, and, while so employed, had no convenient place to work in at the grist mill, and so went down to Drawbaugh's shop to do the work, and while there saw and heard persons talking through the talking machines. Witness never was at the shop again till 1880 (Ans. 26). The job of work only took about half a day (Ans. 42). The work of making wagon axles was going on there at the time (Ans. 43). Dellinger & May took the grist mill when Cyrus Bowman gave it up (Ans. 54), and Jacob Evans was their miller (same answer). Dellinger & May took the mill March 1, 1876 (Ans. 52, 53; and see W. S. Dellinger, Id. p. 439; Jacob Evans, C. Vol. 1, p. 977, Ans. 30, 31; Cyrus Bowman, Id. p. 666, Ans. 1). Witness stated that his brother, Cyrus, while he ran the mill, rented it from George Leonard and "ran it on his own hook." (Ans. 49.) To rebut this evidence the complainants called Cyrus Bowman (C. Vol. 1, p. 666), who swore that George H. Bowman was milling for him in February, 1876, and *could not remember whether he did any millwrighting there or not* (Ans. 8, 13, 14), but that he might have done such work. (Ans. 14, 98.) He also testified that he, Cyrus, knew nothing of Drawbaugh's talking machines while he lived at Milltown, from April 1, 1874, to March 1, 1876, a fact which, even if true, does not disprove George H. Bowman's knowledge of them. He further tried to make it appear that he did not "run the mill on his own hook," but in copartnership with Mr. Leonard—a fact of no importance or value whatever—but on this attempt broke down in cross-examination (pp. 677-679), where it appeared he was in copartnership with Leonard in buying grain, grinding and disposing of it, but not in actually running the mill, nor in the custom work done at the mill for the neighbors. They afterwards called George Leonard as a witness on certain matters, and he confirmed Geo. H. Bowman's statement that Cyrus rented the mill and was, so far as the mill was concerned, Leonard's tenant, and not his copartner (C. Vol. 2, pp. 1203, 1204, Ans. 19-23), and that from April 1, 1875, to March 1, 1876, including the period covered by Geo. H. Bowman's testimony, they were not even copartners in buying and disposing of grain (Ans. 23). The whole effort thus resulted only in corroborating and confirming Geo. H. Bowman's testimony for defendants, not only in its dates, but even in immaterial details.

The defendants then took Cyrus Bowman in hand, and proved by Ramsey (D. S-reb., p. 1118) that a suit, which he had admitted was on one of the mill accounts (C. Vol. 1, p. 677, Ans. 72, 77), was brought by him alone, and not jointly with Mr. Leonard, thereby showing that he perfectly well knew he was not a co-partner with Leonard in the mill business, and also proved by *Harris* (D. S-reb., p. 465), *Hacket* (Id., p. 690), and *Mrs. Swigert* (Id., p. 869), that while Cyrus Bowman was living at Milltown from April 1, 1874, to March 1, 1876, they heard Drawbaugh's talking machines talked about in his family by his wife, his children, and even by himself! Their testimony is clear, positive and circumstantial, and such as to leave no reason to doubt its truthfulness. Mrs. Swigert is Mrs. Cyrus Bowman's sister, and was much at his house at that time; Hackett was one of his workmen in the mill in 1874, and Harris is Mrs. Cyrus Bowman's brother, and was in the habit of visiting at his house in Milltown.

The complainants then recalled Cyrus Bowman (C. Vol. 3, p. 2013), who testified to something clearly beyond his own knowedge, to wit., that while he lived at Milltown there was never any talk in his family by his *wife*, his *children*, or himself, about Drawbaugh's talking machines (Ans. 2), and denied talking to Harris or Mrs. Swigert about it (Ans. 3, 4), but was totally silent as to any talk with *Hackett*. They also called Mrs. Cyrus Bowman (Id. p. 2008), who said that she never heard of the talking machine while she lived at Milltown (Ans. 4).

In law the affirmative evidence of her brother and sister and the workman, Hackett, vastly outweighs the mere negative of Mr. and Mrs. Bowman, and it stands proved that Drawbaugh's talking machine was known to them prior to March, 1876, and even as early as the year 1874. The attempt of the complainants to rebut George H. Bowman totally fails, in every particular, and results, as usual, only in making the evidence of Drawbaugh's priority of invention stronger than before.

The attempt to rebut *Henry Herr* by the evidence of Henry Neidig (C. Vol. 2, pp. 1523, 1524) is so weak and puerile as hardly to be worth mentioning. Herr had testified (D. Vol. 2, p. 695) that he first knew of Drawbaugh's talking-machine and saw the old instruments "B" and probably "F," about the time when he was first ordering a hydraulic ram from Drawbaugh along about 1869, and when asked who directed him to go to Drawbaugh for the ram, replied: "*Some* of his neighbors had told me about his putting up rams; I *think* it was Harry Neidig, a cousin of mine; I think he had put one in for him." (Ans. 21.) Neidig testifies that his own ram was put in in May, 1871 (C. Vol. 2, p. 1522, Ans. 20), and he, also, "thinks" he is the person who advised Herr to go to Drawbaugh (Ans. 25), and that such advice was after his own ram was in (Ans. 32), which would, if true, make Herr's date of seeing Drawbaugh's talking machines not earlier than May, 1871. The testimony of both Herr and Neidig, however, leaves it uncertain whether Neidig is the man who directed Herr to go to Drawbaugh, although he may be. The only material question is whether Herr's knowledge of the talking machine was prior to Bell's invention or not. As settling this question, Herr testifies that, to the best of his recollection, it was before he was elected a Director of the Poor of Dauphin County, Pa., in 1871—a year or so before (Ans. 48, 49)—and that he only kept the ram till about 1874, or 1875, as near as he can recollect (Ans. 27); that his earliest knowledge of the talking machine was not long after he first went to Drawbaugh's shop (Ans. 6) and during that same year, to the best of his recollection; that he was there several times for a few years afterwards, to see about repairs, etc. (Ans. 29; that he has no recollection of being there after the beginning of the Centennial (Ans. 44), nor after the Axle Co. commenced work there in March, 1875 (Ans. 2), and never saw the Haucks there (Ans. 4), and that he saw a machine like "C" there towards the latter end of his visits, and about a couple of years after he first saw "B" and the glass instrument. (Ans. 16, 17.) He also says that Drawbaugh put in two rams for him, one to replace the first one, which had gotten out of order (Ans. 33). It is evident from these facts that his knowledge of Drawbaugh's telephone invention was long prior to Bell's earliest dates; and that is the only material fact in question.

In attempting to shake the memory of *Decker* as to one or two of his later dates, the complainants were somewhat more successful, although not to the extent of impeaching the general credibility of the witness, nor the truthfulness of the material parts of his testimony. He testified (D. Vol. 2, pp. 1109–20) that he made four visits to Drawbaugh's shop (Ans. 50), to wit: one in August, 1873 (Ans. 6, 7), one in the fall of 1874 (Ans. 13–21), one in August, 1875 (Ans. 22–38), and one in 1877 (Ans. 39–49), which latter date he fixed by the fact that the visit was soon after the exhibition of the Hazelton clock at Harrisburg, and after he quit working for Col. McCormick, in Sept., 1877. The complainants' proof shows that the Hazelton clock was exhibited from Dec. 25, 1877, to Jan. 5, 1878, and that witness quit working for McCormick March 30, 1878, which, if true, would tend to show that witness' fourth visit to Drawbaugh's shop was sometime in 1878 instead of 1877, and that his memory of dates is not altogether reliable. But as to the dates of his first, second and third visits, his statement is not rebutted, and the circumstances of these visits fix their dates quite conclusively. At the second visit, Kline was expecting soon to go into the axle business (Ans. 14–16) and at the third visit witness carried a box of lubricating grease to Mr. Kline, who was then engaged in the axle business at Drawbaugh's shop, and delivered it to him at said shop. (Ans. 24.) There is little or no room for mistake as to the date here, for Kline is proved to have become interested with Wilson Bear in the axle patent on June 19, 1874 (Bear, D. Vol. 1, p. 635, Ans. 3); to have formed the Axle Co. December 23, 1874 (Moore, Id., p. 614, Ans. 3); to have commenced active business at Drawbaugh's shop in the latter part of March, 1875 (Moore, Ans. 17); and to have retired from the axle business Feb. 29, 1876 (Moore, Ans. 4–7), which agrees with Decker's statement as to the time and circumstances of his second and third visits to the shop. Decker says he saw several talking machines at these two visits, and that Drawbaugh talked to him through them at the second visit (Ans. 17–20), and talked to Kline and him through them at the third visit (Ans. 26–38), and witness heard and answered back through the same instrument at which he had listened (Ans. 38). He thinks he saw "D" at the second visit, but probably has confounded the instruments then seen with those seen at his third visit in

1875. In answer 33, he states portions of the conversation held through the instruments in 1875, among which was an inquiry of Drawbaugh about his old friend, Jacob May, and a remark that he understood there was an increase in May's family, which fact the witness, although a near neighbor of May, at West Fairview village, *could not confirm.* Complainants afterwards called May to prove that there was no increase in his family in 1875, but that in no wise contradicts the witness, whose answer to Drawbaugh's remark or inquiry tended to establish the same fact. Drawbaugh lived about four miles from the village of West Farview, and had probably heard some unfounded rumor as to May's domestic affairs.

The result is, that a fair consideration of Decker's evidence will sustain the general accuracy of his testimony as to the first three visits and their dates, but will lead to the conclusion that his last visit was a year later than he supposed.

In view, however, of his mistake as to the date of his fourth visit, we have not referred to his testimony heretofore in this brief, nor counted him in among the witnesses who prove Drawbaugh's invention prior to January 14, 1876. Whatever his evidence is worth, it is additional to the defendants' evidence hereinbefore cited on that point.

The date fixed in the testimony of *Urias R. Nichols* is also attacked, but we think unsuccessfully. He swore that he was at Drawbaugh's shop and talked through the talking machines in January, 1875. (D., Vol. 1, pp. 89–97.) He fixed the date by the fact that he was on a visit to Harrisburg, in the second week of the session of the State Legislature, to see Representative Stevens with reference to getting a law enacted respecting private roads, and on his way home to York county, stopped at Drawbaugh's shop and saw and talked through the machines. (Ans. 4–17.) He also testified that he ordered some lime at Hake's Kiln on his way home, which was delivered to him on January 18, 1875 (Ans. 12–15), which date he fixed by a memorandum book (Ans. 15–16). He stated in cross-examination that he *thought* he told Mr. Croll and Levi Maish about the talking machines the same winter (Ans. 42–47), and that he had seen Drawbaugh's burr-dressing machine at Kunkel's mill in Lisburne, York county, Pennsylvania, before that time. (Ans. 46.) To rebut this evidence, the complainants produce Croll and Maish, who said he was in error in thinking he had told them at that early time. Mr. Maish recollected some such conversation, however, but thought it must have been after Bell's telephone became known, for the reason that he did not have it brought to his mind by seeing the Bell telephone when exhibited in 1877; but he frankly admitted in cross-answer 26 (C. Vol. 1, pp. 745–6), that it was possible that Nichols was correct about it. Nichols did not swear positively that he told either Croll or Maish about it in 1875, but only thought he did, and that it took place in Maish's office at York, Pa. Croll, however, states that he never was in Maish's office, and hence it is probable that Nichols confounded Croll with some other miller to whom he had casually mentioned it there. The complainants produced Hake's books and clerk, and it appeared that no entry of any sale of lime to Nichols was contained in the books in which the clerk testified all sales were entered at the time when they were made. This, however, may have been due to the accidental omission of the entry. The complainants also undertook to prove that no burr-dressing machine was ever at Kunkel's mill, but signally failed. They examined all the millers who worked in the mill from the year 1868 to the year 1880, *except one, Peter Kunkel, who ran the mill from the spring of 1870 to the spring of 1871* (see E. S. Kunkel, C. Vol. 1, p. 761, Ans. 2-5; J. S. Kunkel, Id., pp. 750, 753, Ans. 8, 38), and by whose omission the evidence is totally incomplete and inconclusive; and, further, they actually corroborated Nichols by E. S. Kunkel (Id., pp. 762-767, Ans. 9, 10, 29-49), who testified that there was a diamond burr-dressing machine at the mill at one time while he was miller, and in or about the year 1873 (Ans. 28, 29), which probably was the very occasion when Nichols saw it there. The testimony of Croll and Maish does not contradict Nichols as to any matter testified to positively by him; the testimony as to the burr-dressing machine carroborates him; and the omission of the entry in the lime-kiln book is easily explainable and is totally inconclusive to rebut his positive statement.

SAMUEL NICHOLS (D. Vol. 1, pp. 227-33) is another witness as to whose testimony a feeble and utterly inconclusive attempt was made to rebut. He testified that he saw and talked through the talking machine, "B" and "F" at Drawbaugh's shop about the summer of 1870 (Ans. 4), and, in answer to a question as to who was with him at the time, said, "My son-in-law, Samuel Bruce, was along with me at the time," &c., &c. (Ans. 5). To rebut this, they proved that Bruce did not marry Miss Nichols till June 10, 1876, (Spese, C. Vol. 1, p. 925,) and they examined Nichols' son, Edward Nichols, (Id. p. 858,) to prove that Samuel Nichols and Bruce were not intimately acquainted in 1870. Samuel Nichols, however, *had not tes-*

tified that Bruce was his son-in-law at the time of the visit, but merely referred to him as Samuel Bruce, my son-in-law, evidently to identify the person; nor had he testified that he was intimately acquainted with Bruce at the time, nor that Bruce had called at his house, nor that he and Bruce had gone from his house to Milltown together. For all that appears, he may have met Bruce and others at Milltown or near Drawbaugh's shop, and gone in with them to see the talking machines. Edward Nichols was only twelve years old at the time, and is obliged to admit (C. Vol. 1, p. 881) that his father ought to know about the facts much better than he. (Ans. 257.) Edward Nichols is one of the "negative witnesses," who worked a short time for the Haucks in Drawbaugh's shop about June, 1874 (Ans. 9), and says he never saw any talking machines there (Ans. 43). But his cross-examination shows that his memory is very defective—he cannot remember half of the machines and inventions which were admittedly at Drawbaugh's shop when he worked there; and his negative testimony as to the talking machines is specifically rebutted by his mother, Mrs. Leah Nichols (D. S-reb. pp. 731-2), and his sister, Mrs. Annie M. Reynolds, (Id. pp. 612-614,) who swears that he knew of them while he worked for the Haucks at Drawbaugh's shop, in 1874, and told about them at home, and said he had seen them, and talked to his father about them. The testimony of Samuel Nichols is, therefore, unshaken, and his knowledge of Drawbaugh's talking machines prior to Bell's invention is corroborated by two additional witnesses.

The complainants also make an attempt to turn the testimony of *P. C. Zimmerman* (D. Vol. 1, pp. 414–19) into a rebuttal of the alleged date of Drawbaugh's invention. Zimmerman testified that he saw instruments "F" and "B" at Drawbaugh's shop in February or March, 1871, just before he moved to Shiremanstown (Ans. 4-6, 15), and described them to defendants' counsel before they showed him the exhibits (Ans. 8-12), and that, when he saw the instruments in 1871, Drawbaugh explained them to him, told him he had talked through them, told him how far they could talk, said they were operated by electricity, described how he made the fine wire for the spools. (Ans. 17-23.) Witness also stated that during the winter of 1880-1881, pending this suit, Mr. Drawbaugh and Mr. Jacobs, one of defendants' counsel, called on him to ascertain whether he could testify to anything material to this controversy, and then followed this interrogatory and answer:

> "Q. 43. Have you had any talk with them (Drawbaugh and Jacobs) about talking machines since that first visit?"
>
> "Ans. I have spoke to Mr. Drawbaugh about it—yes, sir; several times—talking about the machine and about the idea of vibration, and a certain remark he made to me in conversation; the remark was this—that he heard Mr. Samuel Hertzler's daughter play on the organ probably a quarter of a mile from his place of residence; while she was playing the organ, he took notice that there was a sound of a cut-off in that organ, just like a tap, tap, tap, a cut-off in that sound; being anxious to know what caused it, he went to Samuel Hertzler's and found a break in the window-glass; being loose, it would jar; from that he seen what the cause was of that there sound cutting off like; then he said *that that showed him that he was right; that give him an idea that he was right in his study.*" (Ans. 43, p. 437.)

Right in what—in what "study?" The talking machine? There is not a scintilla of evidence that the matter had any connection with the talking machine. Drawbaugh heard a "tap, tap, tap" in the sound of the organ, and apparently attributing it to the broken pane of glass, went to verify his conjecture, and found that he was "right." Even if Drawbaugh afterwards related the circumstance in some conversation with the witness about his telephones, it has no significance whatever—it only shows that when he observed the peculiar sound and discovered the cause of it, he regarded it as confirmatory of some *previous* theory—how long previous does not appear—years, perhaps. *If Drawbaugh had observed the fact only yesterday, he might well have made to-day precisely the same remark about it, although his telephones have admittedly been in existence years prior to yesterday.* Yet the complainants went gravely to work and proved that Samuel Hertzler never had an organ till June 16, 1875! As though that affected the history of Drawbaugh's invention in the slightest degree!—Besides, the witness is testifying to mere conversation. He may have misunderstood it, or misrecollected it. The complainants cross-examined Drawbaugh about it (D. Vol. 2, p. 1026), but he remembers nothing of the occurrence. The effort to use such worthless stuff in rebuttal of positive testimony only shows to what desperate expedients the complainants were reduced. We can clearly understand from it how little they have left undone and unsaid to meet the defendants' case, and how unproductive all the work of their corps of detectives, agents, and attorneys has been.

A few efforts were made to rebut *Daniel Drawbaugh's* testimony, as to immaterial particulars, but with no result in any way impeaching the general accuracy of his statements, even as to details. His testimony covered a period of nearly twenty years of his life, including his inventions, studies, occupation, finances, and even the particulars of his history from year to year in all that time, and, if he had made many mistakes as to small points, during his tedious two months of examination and cross-examination, the fact would have been of no material significance. But the attempt to shake his statements ended in failure.

One point on which they tried to prove him wrong was in regard to the deposition of the $400 found on the person of Miller, who was killed at Williamsport in October, 1867, (Drawbaugh, D. Vol. 2, p. 838, Ans. 460). Drawbaugh sent a man (William Darr) to Williamsport to recover the body and the money, and states in substance that, when the man returned the money, it was about one hundred dollars short, the balance having been paid out in expenses of inquest, coffin, pay of Darr, &c. Of course, he had only Darr's word for the amount and character of the expenses at Williamsport, as he himself was not there and only derived his information from Darr. Complainants in rebuttal prove that the expenses of the inquest &c., were trifling, and were paid by the railroad company and the county, and that the money found on Miller's person, $394.40, was handed over by the authorities at Williamsport to William Darr. (Swan, C. Vol. 1, p. 1020; Whitehead, Id. p. 352, 354; Broderick, Id. p. 356). Then they called Darr (Id. pp. 358-365) to prove that he handed over to Drawbaugh the money which he received from the authorities at Williamsport. We have, however, only his unsupported word for it. His last act before leaving Williamsport was the drinking of whisky (Ans. 37)—an article of which he was so excessively fond that it ruined him and his family and left him a mental and physical wreck, with his memory impaired and unreliable. (See testimony of his wife, D. S-reb. p. 109; his daughter, Mrs. Brenneman, Id. p. 103; and his daughter, Mrs. Brown, Id. p. 163). He is one of the complainants' "negative witness" who denied any knowledge of the talking machines, but was, on that point, contradicted by Peterman (D. S-reb. pp. 471-476) and also by Mrs. Darr and his daughters, Mrs. Brown and Mrs. Brenneman, and his son-in-law, Brenneman, and himself admitted, on cross-examination, the remark of Drawbaugh about talking across the Atlantic ocean, as before referred to. He evinces a disposition to swear to whatever came into his head at the moment, without regard to such trifling matters as facts, testifying in answer 10 that when the money was given him at Williamsport, "It was rolled together, and *I put a little newspaper around it;*" in answer 34 that, when given him there it was not rolled up and covered with newspaper; in answer 46 that *he didn't know who put the newspaper around it;* in answer 47, that *there was a newspaper around it when it was handed to him*, and he put another around it for greater security; in answer 45, that he didn't even know that the money was in bank bills or in any other form till Drawbaugh unrolled it; in answer 10, that when he received the money at Williamsport *he stuck it in his pocket-book;* in answer 47, that *he had no pocket-book*, and therefore just stuck the money in his pocket, etc., etc., etc. Swan thought it necessary to accompany him as far as Bridgeport, and Darr's suspicion that Swan wanted to entice him into the sleeping-car and rob him (Darr Ans. 38), probably indicates his maudlin condition at the time.

A witness of such character and habits, confessidly indulging his appetite for whisky at the very time, broken down in health and memory when on the stand, contradicting himself in his testimony, and contradicted by his whole family and Peterman on an important point in the case, will hardly suffice to shake the testimony of Daniel Drawbaugh; but even if he were right, and Drawbaugh's memory was in error as to this particular fact, which occurred more than 14 years prior to his examination, it would not in any way impair the general credibility of Drawbaugh's testimony. No man has an absolute infallible memory of every event of his life, and Drawbaugh is not held up as an exception to the rule; but only as an honest and truthful witness, giving his best recollection and belief about the events.

In the Darr matter, the complainants undertook, apparently, to show that Drawbaugh had overstated his payments in 1867, and so underrated his pecuniary resources remaining after the transaction. They called Wilson Miller (C. Vol. 2, p. 1198) to show that Drawbaugh had made a similar overstatement in his answer 592 (D. Vol. 2, p. 862). Drawbaugh in said answer testified that he paid Wilson Miller $12.20 on April 3, 1878, and took his receipt therefor, and they wanted to show that he paid only $6.31, in settlement of his entire account with Miller, on April 4, 1878. On recall, however (D. S.-reb. pp. 398-492), Miller testifies that Drawbaugh paid him both the $12.20 on April 3d, and the $6.31 on April 4th, and that the receipt is genuine. Here Drawbaugh had understated the amount paid by him, or, in other words, had testified against the interest of the defendants. The result only emphasizes the honesty of Mr. Drawbaugh's testimony, *and it peculiarly emphasizes the danger of relying upon negative evidence and mere inference to rebut* *affirmative testimony.* Nothing of a negative character could be stronger than the unexplained evidence of the book accounts, and nothing could be weaker than such evidence when afterwards explained by Miller.

As to the two notes, one of Drawbaugh & Kissinger to Leonard (Drawbaugh, D. Vol. 2, pp. 853–4), and one of Drawbaugh to Leonard (Id. pp. 860–1), Drawbaugh states (Ans. 544) that he does not know when the first one was paid, and (Ans. 546) that he has forgotten how Kissinger came to sign it. It subsequently appeared from Leonard's testimony (C. Vol. 2, pp. 1199–1205) that the first note was merged in the second, and he explains how they originated. The explanation supplies matter which Drawbaugh stated that he did not remember about, and in nowise detracts from the strength of his testimony.

The same remark is true of his testimony (D. Vol. 2, p. 1079, Ans. 1749–1751), as to payments made by him out of the old faucet money. He states positively, in answer 1749, that he did not remember to whom he paid out the money for old debts, store-bills, etc., etc. When pressed by complainants' counsel to name some one, he stated that he paid bills to Graybill & Zacharias and Natcher about that time, but did not testify positively that they were paid *at* that time nor *out of* that money. Complainants subsequently called *Lewis* (C. Vol. 2, p. 1262) to prove that Graybill entered the firm in February, 1869, and called Natcher (C. Vol. 1, p. 500) to show that his bills were paid in 1870 and 1871. In view of Drawbaugh's declared inability to specify positively the parties to whom old debts were paid out of that particular money (which was received in small sums all along from May, 1867, to *some time in 1869*—see D. Vol. 2, pp. 839–841, endorsement on notes), and of his recollection of the payments to Natcher only as being "about that time," the evidence of Natcher and Lewis amounts absolutely to nothing.

After the defendants had taken their sur-rebutting evidence, the complainants once more started out in rebuttal, aiming their efforts at two or three of the sur-rebutting witnesses, to wit, Eicholtz, Jacob Evans, Sarah Evans, and the Kahney boys. These efforts were, if anything, more futile than their former attempts.

First, they tried to attack the testimony of Jacob Evans (their own former witness) by the statement of Fisher, (C. Vol. 3, p. 2103), George Ditlow (Id. p. 2122), and E. F. Garman (Id. p. 2334), to the effect that Evans, in the summer of 1883, after testifying for the complainants and before testifying for the defendants, had stated that he didn't believe Drawbaugh ever had a telephone.

Garman was, however, immediately disposed of by proof of his bad general reputation for truth and veracity (see D. S-rej, *Baughman*, p. 243; *Buttorff*, p. 244; *Himelreich*, p. 245; *Long*, p. 223; and *Prowell*, p. 247), which the complainants made no attempt to answer. *Evans* was called in sur-rejoinder (D. S-rej., p. 163), and denied making any such remarks as were attributed to him by complainants' witnesses, and testified positively to what he did say at the time; and *R. A. Ross*, who was present at the time of the alleged conversation, corroborated Evans in every particular. The cross-examination of Fisher and Ditlow brought out many inconsistencies in their testimony, and also revealed the suggestive fact that Mr. John C. Comfort, complainants' agent and detective, was quite free in the use of money before they went on the stand,—offering Fisher ten dollars to go and see Ditlow and Garman (Fisher, p. 2114), and paying Ditlow five dollars to go and see Fisher and Garman (Ditlow p. 2142), very large wages for laboring men for an hour or two of walking and talking. Ditlow's return to the witness stand (p. 2145) at *somebody's* suggestion, to get himself out of a gross error in his testimony, is also highly suggestive. The attack upon Evans is clearly not successful, and that Evans had, before the year 1876, both seen and talked through Drawbaugh's talking machine, is overwhelming proved by a large number of witnesses in addition to his own testimony. The complainants themselves had already examined him to prove that he knew of Drawbaugh's talking machine in 1877, and now try to represent him as saying, in conversation, in 1883, that he never saw it and didn't believe it was there!

The attempt to rebut Eicholtz grew out of the fact that he stated in Answer 7 (D. S-reb., p. 153) that on November 6, 1873, when wituess was returning from Drawbaugh's shop to Harisburg, John Teahl rode along with him from Teahl's mill, where he was milling at the time. They called Calvin Etter (C. Vol. 3, p. 2074) to prove that Teahl milled at "Teahl's Mill" up to about March, 1871, but never afterwards. The reasonable explanation is that Teahl happened to be at the mill again that day, and rode to Harrisburg with Eicholtz, who, residing at some distance from the mill, and having known of Teahl's former proprietorship of it, was probably unaware of his selling out, or, if aware of it at the time, had forgotten the fact when he gave his testimony. The date, and the facts concerning his visit to Drawbaugh's shop and seeing and talking through the telephone there, are corroborated by Mrs. Eicholtz and George B. Eyster (D. S-reb., pp. 158, 890), and so trifling an error as this does not even raise a doubt as to the general accuracy and truthfulness of his evidence.

An absurd effort was made to contradict *Sarah E. Evans* as to the weather on the day of the Evans visit to Drawbaugh's shop about December 1, 1875. Several days after she left the witness stand she was recalled at complainants' request for further cross-examination (D. S-reb., pp. 86, 87), and was asked what the weather was on Sunday *evening as she was returning home* (Q. 73-76), to which she replied that it was pretty *cold* (Ans. 73), but *not snowing* (Ans. 74), and was *cloudy* but *not raining* (Ans. 76); to rebut which the complainants put in evidence the weather report for December 5, 1875, printed in the Harrisburg newspapers of December 6 (C. Vol. 3, pp. 2398, 2399), which referred to "disagreeable, cold, incessant rain of yesterday" that "kept many people indoors" in Harrisburg, and to the northeast winds, fog and rain which "prevailed" from the Middle States to the Mississippi. But the Evanses went home from Milltown to Dillsburg late in the afternoon, starting about three or four o'clock and arriving home after dark, and it may well have been a cold, rainy day, but, at that late hour, only "cold" and "cloudy," as Sarah testified. The visit, the date, and the facts that occurred that day at Drawbaugh's shop, are attested by too many witnesses, and in too clear and convincing a manner, to be affected by such loose statements as those of the Harrisburg newspapers.

The complainants made an equally ludicrous effort to rebut the the testimony of the Kahney boys by calling their father, John Kahney (C. Vol. 3, p. 2034), and Henry Neidig (C. Vol. 2, p. 1520), to prove that those witnesses never heard the Kahney boys say anything about Drawbaugh's talking machines. Such stuff as that, to rebut the positive testimony of the four brothers, one of whom was the complainants' own witness, corroborated by another unimpeached witness, Basehore.

To appreciate the utterly worthless character of such testimony, see the depositions of complainants' witnesses, A. L. Rupp and George C. Rupp (C. Vol. 2, pp. 1111, 1122), who swear that they separately visited Drawbaugh's shop and talked through his talking machines in the winter of 1877-8; yet, although they had lived together in the same family, neither knew, until about the time of their being called as witnesses, that the other had any knowledge of the talking machines.

The attempt to answer the defendants' evidence by such trash indicates only that it is unanswerable.

It is certainly no exaggeration to say that the efforts of complainants to specifically rebut or shake the testimony of the opposing witnesses have merely resulted in materially strengthening the defendants' evidence. The fact that, with all their resources of time, money, and zealous agents dwelling right in Drawbaugh's neighborhood, they have found so few witnesses open to *any* attack, and have, even as to those few, so signally failed, speaks volumes in favor of the integrity of their opponents' case.

The complainants having thus failed to shake the defendants' case by their negative evidence, and having broken down in their sporadic attempts at specific rebuttal, they have absolutely nothing left to oppose to the defense of Drawbaugh's priority of invention except a few *inferences*—mere arguments, based upon what he did not do with his invention. These we will now proceed briefly to consider.

3. THE COMPLAINANTS' ARGUMENTS AS TO THE CONCLUSION TO BE DRAWN FROM DRAWBAUGH'S NOT PATENTING HIS INVENTION, NOR INTRODUCING IT INTO COMMERCIAL USE, NOR ANNOUNCING IT IN PRINTED PUBLICATIONS, PRIOR TO BELL.

The defense of *prior invention* is made out by proof that the invention was made and was capable of operating, or was successfully operated, even if only experimentally, before the patentee's date of invention. The law does not require that the prior invention should have been patented or introduced into public use, or described in printed publications—satisfactory proof of its prior *existence* is all that is needed to render the defense complete. This defense, therefore, differs radically from the defense of two years' prior *public use*, which is not supported by proof of mere experimental use, but on the contrary, requires that the article should have been on sale or in use for exhibitional or business purposes, and must be pleaded and proved in a different manner altogether. *Kelleher* v. *Darling*.

The argument of the complainants, therefore, is not that the patenting of Drawbaugh's talking machines, or their manufacture and sale, or the publication of notices of them in the public prints is essential to complete the defense of prior invention; but, on the other hand, that by reason of his not doing any of these things, there arises an *inference* that he did not have the invention prior to Bell. In other words, they say it is incredible that he should have had the invention and yet left thess things undone.

To this argument we put in, at the outset, a general demurrer. Let the court give it its full force and effect, *and it does not show that the story is incredible.*

When more than two hundred witnesses testify to the fact of Drawbaugh's prior invention of the electric speaking telephone, something more than *inference* and *argument* is necessary to overthrow their testimony and convict them all of perjury. Many things appear incredible simply through our ignorance of all the facts and surrounding circumstances, *or more often from our preconceived prejudices on the subject in question.* When we attempt to balance probabilities, and throw our *prejudices* into the scale, the result is necessarily erroneous.

Balancing the probabilities in this case, without prejudice, which is the more incredible, that, on the one hand, Drawbaugh should have been operating and exhibiting the invention for years prior to Bell, without patenting, manufacturing or announcing it through the public prints; or that, on the other hand, more than two hundred witnesses to his invention prior to February 14, 1876, should have mistaken the facts or testified falsely? These witnesses for the defense are from all parts of Pennsylvania, and even from distant States; they are from every station in life, ex-congressmen, ministers of the gospel, college professors, lawyers, doctors, merchants, mechanics, manufacturers, farmers, laborers, railroad men, clerks, &c., &c.; they are persons of the highest character and standing in their several communities, so far as truth and veracity are concerned—not in a single instance has this fact been even questioned in the complainants' proofs; and many of them never were in Drawbaugh's shop after June 1, 1875, nor even for a considerable time prior to that date; —now which theory is the more incredible,—that they could all be wrong, or that the complainants' inferences and suspicions are unfounded and unreliable? Does the history of all the courts in the world exhibit a solitary instance where such an array of testimony was ever overthrown by *inferences* and *arguments as to its incredibility?* Can the Court find a case where two hundred witnesses have gone wrong, and all the skill and ingenuity of able counsel and zealous detectives, having abundant financial resources and years of time for investigation, have been unable to demonstrate their error? Can the Court conceive the possibility of so vast an array of witnesses scattered all over the country, blundering into the same error without collusion, or, on the other hand, can it conceive the possibility of their being in collusion? Was Draper in collusion when he told the complainants the same story before the defendants ever had seen him or known of his story? Were Spafford and McHenry, who had never seen Drawbaugh nor been at his shop, in collusion? Was Professor Heiges or Rev. John H. Young in collusion with defendants?

Were the Hon. Richard J. Haldeman and his wife (the daughter of Simon Cameron) in collusion with the defendants? Were David Stevenson, Jr., and the two Gregorys in collusion with defendants when they told the complainants the same story in advance of any communication with the defendants?

These general considerations alone are an absolutely conclusive answer to the complainants' inferences. But they are not the only answer. Each one of those inferences is shown by the proofs in the case to be practically unfounded, and to a brief consideration of this fact we will now devote our attention.

In order that we may not mistake the complainant's inferences, we will give them in their own language, quoting from one of their briefs below. They there recapitulate their inferences and arguments as follows:

RECAPITULATION.

"1. Drawbaugh's claims were first made public in 1880—when Bell's patent was four years old—and thousands of telephones made under it were in public use.

"2. The publication of Drawbaugh's claims at that late date was not his own doing. He was dragged to light by infringers of the Bell patent in need of a defense.

"3. Although Drawbaugh claims to have had operative speaking telephones as early as 1867, no patent was applied for, no caveat filed, until 1880; nor was his alleged invention used except in his own shop, and experimentally.

"4. Bell's invention was given to the world in 1876, and before the close of that year had attained world-wide notoriety. Before another year had gone by the invention was in extensive public use. This was known to Drawbaugh, yet he made no sign, even in the public prints. Such silence, under such circumstances, is irreconcilable with the truth of his present story.

"5. He was not a man unnoticed or unknown. He kept himself before the eyes of his community as an inventor. He exhibited at public exhibitions. He was mentioned in the newspapers. He had occasion both before and after Bell's patent to enumerate the works on which he rested his claim to be an inventor. But the invention of the speaking telephone was not among those alleged creations which he enumerated or which others attributed to him.

"6. The proofs show that the allegations made in defendants' pleadings as to Drawbaugh's abject poverty and lack of means and facilities for experimenting, are essentially untrue, and that, on the contrary, during all these years in which he claims to have been in possession of the invention, his situation and opportunities for developing it —if he had it—were exceptionally favorable. During that very time he was holding himself out to the public as a machinist whose specialty was 'electrical' machinery; as a solicitor of patents, etc., etc.; and it appears that he had, in fact, all the mechanical skill and all the tools and appliances for making that skill available for the ready production of speaking telephones—if only he had possessed the invention. That he did not give the speaking telephone to the world was *not* owing either to poverty or to lack of mechanical skill or appliances.

"7. Nor was it owing to lack of moneyed persons willing to interest themselves in such an invention. The proofs show that Drawbaugh's neighbors were only too ready to invest their means in schemes of his devising, and the inference is irresistible that if he did not interest moneyed neighbors in a 'talking machine' it must have been because he did not seek to do so, or more probably because he had no 'talking machins' fit to attract their attention."

Let us consider these assertions in their order:

Paragraph 1 needs no comments further than this—that Drawbaugh *did* make his claims public *to his community*, long before Bell's invention. His machines, and the knowledge that he claimed them to be his invention, and novel and valuable, were no secrets, but were known all around that part of the country. It is in evidence not only that they were known to the hundreds of witnesses who have affirmed their own knowledge of them, but also that they were generally known and talked about through that region. This is making his claims public, in the sense of the patent law, just as much as any other mode of asserting them.

Paragraph 2 would be inconsequential if true, but is not true, as we have just shown. He was not dragged to light by infringers, but the fact that was already well known in Cumberland county, Pa., and to many persons outside of that county, reached the knowledge of these defendants also, and they then sought to make a perfectly legitimate use of it in defense of the complainants' invalid and worthless patents.

Paragraph 3 has been already practically answered in this brief, by an explanation of the reasons why Drawbaugh did not patent, nor manufacture for public use, his invention. For the first two or three years he considered his invention as experimental and needing improvement. During this time, he had no reason to suppose that when it became satisfactorily completed, he would be too poor to do anything with it, or that, if he should be, others would fail to appreciate its commercial value and come to his aid. By the time when this experimental period had passed, in 1870, or thereabouts, he was in utter poverty, and remained so until 1880. He tried to induce others to accept one-half of the invention and patent and introduce it, but they, like Gardiner C. Hubbard and others in Bell's case, looked upon it as having no commercial value, and declined their efforts to induce others to take hold of it, continued all along till after the introduction of the Bell telephone, when there came into existence another strong element of discouragement to investors, viz.: fear of litigation with the owners of the Bell patents. It is undoubtedly the fact that, during considerable periods, prior to 1877, Drawbaugh was expecting parties to go in who, like Baylor, Herr, Draper, Snyder and others, seem to have held the matter for a while under advisement, and to have finally declined, not formally, but by mere delay and neglect to act. He did not manufacture the machines for public use because he he had no means, and because he did not propose to render his invention public property, but intended first to patent it and afterwards to put it on sale.

Paragraph 4 is equally inconclusive. Drawbaugh was not a learned man, a lecturer, a writer, like Bell. He was not given to newspaper controversies, and probably never wrote an article for a newspaper in his life. He was conscious of his illiteracy, sensitive and diffident, and, by the time when he knew of the introduction of the Bell telephone, found himself already face to face with a powerful moneyed interest which had the ear of the public and had skillfully entrenched itself in public opinion. His poverty he felt to be an insuperable obstacle to any scheme of opposing, single-handed and alone, so potent an adversary. A man of bold, aggressive character, quick to push himself into the public gaze, readily grasping the financial possibilities involved at that time even in a public proclamation of his right, would, probably, have done otherwise; but the acts must be judged by the man, and by his circumstances. Drawbaugh was not that kind of a man. He did not abandon his right, nor lay aside his invention, nor desist from importuning others to take hold of it with him and furnish the means for establishing his title. Without knowing Bell's or Edison's date of invention, he frequently declared to others that he believed himself to be the prior inventor, as he had been a very long time engaged in the work. (See H. F. Drawbaugh, Chellis and complainants' witnesses, Matthews and Weaver.)

Paragraph 5 is a tissue of misrepresentations, and of other statements which, while literally accurate in terms, are false in their suggestions. In a certain sense, he "kept himself before the eyes of his community as an inventor," and, it should have been added, *as the inventor of the talking machine*. It is *not true* that he ever "exhibited at public exhibitions;" he merely superintended an exhibition at Harrisburg in 1868, and again in 1869, for the owners of his pump invention and his nail machine invention; and, in 1878, for the owners of the electric clock invention; and with their money, not his own. It is true that he was "mentioned in the newspapers," but not by his own procurement. The statement that "he had occasion, both before and after Bell's patent, to enumerate the works on which he rested his claim to be an inventor, but the invention of the speaking telephone was not among those alleged creations which he enumerated, or which others attributed to him," is not broadly true. He had no *occasion* to verify his claim to be an inventor by enumerating the works on which he rested that claim, nor is there the slightest evidence that such a thought was ever in his mind. We should be at a loss to understand what the appellees' counsel mean by this allegation, were it not for the antecedent statements in their brief from which it has been copied, where we learn the following:

First. That in January, 1869, he agreed to give the pump company the gas-governor that he was then preparing, but did not agree to give them the talking machine. Verily, this is a powerful argument! Possibly he did not *wish* to give them his most valuable invention "on conditions to be agreed upon hereafter." Possibly he did not consider it ready, at that early date, to be put upon the market. Possibly the company, like Mr. Gardiner G. Hubbard in 1875, did not believe in the commercial value of an electric talking machine, and did not wish to manufacture it. A dozen good and sufficient reasons can be suggested for his not giving it to them, all consistent with the theory that he had it and valued it highly.

Second. We are informed by the same brief that in March, 1869, the pump company wanted him to get up a *screw-machine* for the use of the shop and its benefit. What in the world has that to do with the existence or non-existence of his talking machine at the time?

Third. We also learn that the Faucet Company had a bill head printed in 1870, which enumerated a list of the machines they were manufacturing and selling, and it did not include the talking-machines. Certainly not; why should it? He had not given them the right to manufacture the talking-machines, and they were advertising only their own manufactures.

Fourth. It is stated that, in the summer of 1874, he had some advertising cards printed by Holsinger, which enumerated a great many different inventions, but did not enumerate the talking-machines. This card was proved by Holsinger, who swore at the same time that he had knowledge of Drawbaugh's talking-machines prior to that date. It was evidently written by Holsinger, and not by Drawbaugh, as appears from the inaccurate expression, "*inventor* of the following *patents*," an expression not likely to have been used by Drawbaugh, and also from the inaccurate description of the magneto-electric machines as a machine for "fire alarm and propelling electric clocks," with neither of which did it have anything to do, nor was it applicable to them in any way. It did not profess to give the list, as a list, of *all* Drawbaugh's inventions, *nor was it such a list in fact*, for, besides omitting the talking-machines, it omitted the *stamp cancellers*, the *steam syphon pump*, the *automatic boiler-feed*, the *pressure blower*, the *tack machine*, the *machine for wrapping wire*, the *weather indicator*, and the *gas governor*, all proven, even by the complainants' witnesses, to have been in existence prior to that date. *Why* these various inventions were omitted we are not informed; but we *do* know, on the complainants' own evidence, that the fact of their omission from that card is no more true than the fact of their existence at and prior to that time. Both facts were true, and, therefore, both were consistent with each other. In like manner, the fact of the existence of the talking-machines, at and prior to that date, is proven, and their omission from the card does not, by implication, negative the proof any more than the omission of the other negatives *their* conceded prior existence. The inconclusiveness of negative evidence, and mere inference, as applied to the one, is proved by its worthlessness as applied to the others. Whoever wrote the card, he was clearly *not* giving a list of all of Drawbaugh's inventions, a fact which deprives the complainants' argument of its sole foundation. Even if the card had assumed to give a full and complete list, it was open, like a receipt, to correction and explanation by oral evidence, but it assumed no such thing—it is only the complainants' *argument* which assumes such fact.

The complainants may try to break the force of this answer to their inferences, by arguing that the other omitted inventions were not considered worth mentioning in the card; but this, again, is mere assumption—no such explanation is proved in the record. As an argument it concedes the *fact* that the card was not intended to, and did not, give a full list of all the inventions that he claimed at that period to have made; and concedes that the inventions which were thus designedly omitted from the card were omitted for *some* good and satisfactory reason; and then coolly assumes the reason. And the alleged reason, when we consider it, is found to involve assumption upon assumption, to wit: first, that the omitted inventions were considered of no value, which is not proved of any of them, *and is expressly disproved as to the talking machine;* secondly, that they were all omitted for one and the same reason, which is not proved; and thirdly, that the complainants have hit upon the correct reason, which, also, is mere assumption. The complainants' argument thus begs the question, by assuming the facts upon which it is based; it then asks the Court to disregard the evidence which disproves the correctness of such assumption, especially as to the talking machines; and, finally, it *begs the conclusion.*

Seeing the absurdity of this position, the complainants may try a different hypothesis: They may say that, perhaps, that the card did not enumerate the talking machines because they were incomplete and only experimental.

This explanation if offered, *sets out by conceding that Drawbaugh had talking machines in and prior to the summer of* 1874, and tries to mitigate the force of this fact by *assuming* them to have been inchoate, incomplete and unsatisfactory at that time. In other words, it begins by corroborating the defendants' witnesses as to the vital fact in the case, and assumes all the rest. If, after all their efforts to prove the contrary, the complainants are obliged to admit that Drawbaugh had electric talking machines, of *any* kind, in the summer of 1874, who can believe them when they now become reduced to the mere *assumption* that those machines were not satisfactory? In granting the correctness of the defendants' witnesses, as to the main fact, they greatly strengthen their probative force as to the accompanying facts testified to by them.

But the assumption that the machines, so admitted to exist, were unsatisfactory and incomplete, is conclusively destroyed by the evidence. The instruments are shown to have been F, B, C, I and A, of which the latter, at least, is one of the "highly organized" instruments referred to by the complainants' counsel in the Overland Case. Moreover, the evidence of Waggoner, Hubler and others, shows that at that time Drawbaugh considered and declared the invention to be substantially completed and perfected. The evidence of scores of witnesses shows that it was capable of transmitting and reproducing articulate speech at a distance by electricity; and the evidence of Herr, Baylor, Draper, C. Eberly and many others shows that Drawbaugh was then, and had for some time been, endeavoring to get capitalists to take hold of it with him and patent and introduce it. If he had such machines at all, which this argument concedes, the evidence conclusively proves these facts in regard to them; and no mere assumption of the complainants can diminish its effect. This attempt to assume a reason for omitting them from the card is, therefore, a failure.

The probable reason is that, inasmuch as Drawbaugh considered the invention to be of great value and the crowning work of his life, and found himself unable to secure capital at present to patent and introduce it, and did not wish to have it stolen from him, nor to have it get into public use till patented, he may not have considered it wise to advertise it. This theory is consistent with all the evidence, and his conduct in so doing must be conceded to have been reasonable and proper under the circumstances.

This reason is consistent with the proved facts, and is, at the least, quite as satisfactory as the assumptions of the complainants, which are not consistent with proved facts.

But the one fact alone, to wit, that the list does not purport to give all his inventions, and that several inventions conceded to have been made by Drawbaugh prior to the summer of 1874 were omitted from it, is a sufficient answer to the whole argument, which, as stated in their recapitulation in the Overland brief, rests upon the assumption that he had occasion to give, and did give, a list of *all* his inventions made at or before that time.

Fifth. To support the same paragraph of the complainants' recapitulation, we find it argued in their said brief, that Drawbaugh's answer to a question in the Hauck interference in 1879, negatives the testimony of the defendants' witnesses. The opposing counsel in the interference was endeavoring to clear the ground for a possible argument that Drawbaugh was a man who could conceive, but not perfect, an invention, and, in the course of his cross-examination, the following question and answer occur:

> "Cross-Q. 104. *Since* 1866, what machines have you conceived and perfected that have worked satisfactorily?"
>
> "Ans. To the best of my knowledge, *I think that they all have.* The nail machine gave satisfaction. I had it running in the works, but the nailers drove me out. The tram and red staff was a good machine, and adopted by a number of millers, and acknowledged by them to be a good machine. The magnetic clock I considered a good thing, but I am not through with experiments on it. I believe this last faucet is a good thing."

Now, examining the question put to the witness, it will be seen that it does not include the talking machine, which was conceived prior to 1867, but only such machines as were conceived "since 1866," that is to say, in 1867 or subsequently.

Again, the witness' answer shows conclusively that he did not feel called upon by the question to set forth a *list* of his inventions. Accordingly, he answers the question in one line: "To the best of my knowledge I think they all have." That was a complete answer to the interrogatory, disposing, in one sentence, of the whole matter of the inquiry. Having given this answer, it evidently occurred to his mind to mention some of his machines *which had notoriously been in public use and on sale*, and of the acknowledged merits of which his interlocutor must be aware. He therefore specifically mentions *four* inventions out of the large number which he had made during the period of the inquiry. He did not even specifically mention all the machines which had been in successful public use, such as the faucet and pump which the Haucks themselves had been making and selling for six years, nor the carpet-sewing instruments of which many had been sold for years, nor the grape-stemming machine which Hertzler had been successfully using in his business, nor many others that he might have referred to in the same category. He carefully excluded from specific mention all that he had simply used for experiment or exhibition in his shop. And he concludes by expressing his opinion of the machine then in controversy. That this is the meaning of his answer, is evident from even a cursory examination of it, and the attempt to distort it into a piece of negative evidence is without justification by the facts. At that time, *June*, 1879, Drawbaugh had many elaborate and excellent telephones in his shop, on the complainants' own evidence, and, a year before, had claimed to have invented both the battery and magneto instruments, as appears in the "History of Cumberland County."

Sixth. As another ground for the fifth point of the complainants' recapitulation, we find in the body of said brief, that in 1876 Drawbaugh had a bill-head printed in which he used the following terms: "Daniel Drawbaugh, Practical Machinist, *Small machinery, patent office models, electric machines, &c., a specialty.*" But this is no list nor "enumeration" of his inventions, and does not in the least tend to support the complainants' argument as stated in their recapitulation.

Seventh. In their said brief the complainants do not attempt to cite any other instance than those above given, as an instance where Daniel Drawbaugh "had occasion" "to enumerate the work on which he rested his claim to "be an inventor," with the single exception of the list given in "Wing's History of Cumberland County," and made up from materials procured by the publishers, through Hull and Nesbit, in the summer of 1878. Here they attempted to prove a negative by putting in evidence an extract from a book known to be incomplete; and, when foiled in this commendable enterprise to misrepresent Mr. Drawbaugh, they are obliged to admit that he *did* enumerate the telephones, both battery and magneto, as his invention. And what is their answer to this fact? Merely that Mr. Hull, in making up his manuscript, didn't couch the statement in such language as they think would have been used if Mr. Drawbaugh had assumed to be the first inventor. Hull's statement is as follows: "He is "the inventor of the justly celebrated electric clock, *and* "*of several kinds of telephones, one of which is operated by* "*a battery, and the other by induction.*" This language is not justly subject to the criticism referred to, even if it were Drawbaugh's language; but it is Mr. Hull's language. Drawbaugh is clearly not responsible for the form of expression used by Mr. Hull in attempting to state the facts which he had learned from him. The criticism is an abortive effort to impair the force of the fact that Drawbaugh claimed to be the inventor of both kinds of telephone, after having vainly endeavored to prove that he did not mention the telephones to Mr. Hull, and being caught in the very act of misrepresenting him and trying to deceive and mislead the court. It is a case of very sour grapes. Besides, Drawbaugh's claiming or not claiming priority, in that particular interview, is not material. Probably the subject of priority was not discussed, and, if it was discussed, Hull may have omitted all reference to it.

Having thus seen that the facts do not at all support the allegations contained in the fifth paragraph of the complainants' recapitulation, let us see if the sixth fares any better.

Paragraph 6 is like paragraph 5, a mere inference, based upon gross misrepresentation of the proved facts. The defendants' allegations as to Mr. Drawbaugh's extreme poverty, have been conclusively proved, as we have already shown elsewhere in this brief. The complainants' allusions to Drawbaugh's alleged "exceptionally favorable" facilities for developing the invention—"if he had it"—are utterly inconclusive, even if the assumed fact were true. He *did* develop the invention, facilities or no facilities, and the question what kind of tools he did it with is of no importance. The fact *that he did it*, cannot be disproved by showing that he had the requisite tools to do it with, even if it be shown that the defendants, in their answer to the bill, were in error as to the character of his tools at the time. Drawbaugh testifies that he does not think his tools were the best that could be had for the purpose, but whether he had or not is utterly immaterial in view of the fact that he made the machines and made them talk—"highly organized" machines, too, as the complainants say.

But let us see if the complainants do not misrepresent the fact here also. Up to July 1, 1873, Drawbaugh had the use of the old Faucet Company's tools and machinery. These were special tools, adapted to making faucets, and not to electrical machinery at all. From 1873, to May, 1876, these tools belonged to the Haucks, and Drawbaugh had no right to use them. In May, 1876, they were removed from the shop. From March, 1875, to some time in the fall of 1876 the Axle Company's tools were at the shop, but they, too, were special tools, adapted to making axles, and not to electrical devices, and Drawbaugh had no right to use them. When afterwards the Clock Company sought to make electrical clocks, they had to procure new machinery and appliances. It is undoubtedly true, on the evidence, that Drawbaugh's tools, adapted to his electrical work, from 1866 to 1878, were for the greater part, only such as he himself made for his own use, just as he made the machine for winding his spools or electro-magnets, and for insulating his wire. The fact that he solicited electrical work from others does not disprove this, nor detract from its force. He had to make a living; was interested in that kind of work, and did it the best that he could, relying upon such tools as he had.

But it is further argued, in the same connection, that the testimony of Drawbaugh and more than two hundred other witnesses is not to be believed because he advertised himself in the Holsinger card heretofore referred to, as *a solicitor of patents.*

This, however, is all explained by Drawbaugh in exact accordance with the proved facts, and his explanation is reasonable and conclusive.

It appears from his evidence that other illiterate inventors around in that region had gotten into the habit of coming to him and consuming his time in getting him to write out a rough description of their inventions, in order to assist their patent solicitors afterwards in making up their application for the Patent Office, and that he found himself able thus to make a small fee occasionally. (D. Vol. 2, pp. 863–4, 896.) In one or two instances, where the inventions were simple and easily described and claimed, his descriptions appear to have been considered good enough to be filed in the Patent Office by the inventors. He says, however, that he considered himself incompetent to draw good specifications; and can the Court have any doubt that this opinion was correct? If it has, let it look at his correspondence, so far as it is in evidence, as for example, in the letter to Kahney (D. S.-reb. p. 245), for confirmation of the fact. He says that he never appeared in the Patent Office as a solicitor for himself or anybody else, which statement is conclusively confirmed by the Patent Office certificate printed on p. 775, of the defendants' surrebutting evidence; and that his attempts to draw specifications were, in almost all instances, revised by some patent solicitor. Why did he consider it thus necessary to have his work revised by others before filing it in the Patent Office? Why did he never file the applications himself and conduct the correspondence with the Patent Office? Why did he *always*, when patenting any of his own inventions, deem it necessary to procure a regular solicitor other than himself? These things show that his explanation is strictly truthful and accurate. Can it be assumed that, when he felt himself incompetent to solicit a patent upon his own faucet or earth battery or other simple and comparatively valueless machine, he could, for a moment, have trusted himself to draw the specifications and claims for that invention, which was at once the most important of all, and the most difficult to properly describe and secure by letters patent? The question answers itself, and the complainants' criticism and argument fall to the ground. If he had drawn his own patent, he would most assuredly have lost his invention. There is not one chance in ten thousand that he could have drawn a claim to the "method and apparatus" for transmission of speech by undulatory currents that would have stood the tests of law. His judgment in the matter is rather to be commended than criticised. That he should have had the vanity to attempt to trust his own unskilled hand and ignorance of legal principles in such a work, is far more incredible than that he should have waited from month to month for his arguments and exhibitions of the work of his machines, to bring capitalists to his aid and enable him to secure competent legal assistance in procuring his patents.

Paragraph 7 is of the same general character as the others in its gross misstatements of fact and disregard of the evidence. The proofs do *not* show that Drawbaugh's "neighbors were only too ready to invest their means in "schemes of his devising," but the contrary. True, eight of them invested in his faucet in 1867, but their losses in that enterprise undoubtedly discouraged both them and many others from afterward taking any interest in his other inventions.

So, too, Christian Eberly took an interest in five of his earlier inventions prior to 1870, but declined to take an interest in the talking machine, although urged to do so. (D. Vol. 1, p. 115–6.) When asked who furnished the money for those five inventions, he answered: "I "furnished all the money, for I don't recollect of him "ever having any money; it's true." And Mr. Eberly's experience, together with his own pecuniary embarrasment, afterwards undoubtedly prevented him from investing money in any business founded upon a patent. The Axle company, manufacturing under the patents of Kline, from March, 1875 to the spring of 1876, was a financial failure (Moore, D, Vol. 1, p. 625, Ans. 47), and its ill luck tended to discourage local investment in similar enterprises. From September, 1873, till as late as 1877 or 1878, it will be remembered, was the period of "contraction," in which the starting of any new commercial or manufacturing business was a matter of doubtful issue, and, as a consequence, capitalists were everywhere cautious about making such investments. In 1876, Shapley, of Mechanicsburg, talked about taking hold of the electric clock invention, but it amounted only to talk; when the time arrived for putting up his money he backed out. In 1878, Shettell and the Grissingers went into the clock enterprise through the influence of Shettel, who, years before that time, knew of the successful working of the talking machine, but, like Gardiner G. Hubbard and Thomas Sanders, and even Elisha Gray, saw no money in it. And it is abundantly proved that, had his neighbors been "only too ready to invest their means in schemes of "his devising," Drawbaugh would have patented his telephone invention long before the public ever heard of Alexander Graham Bell.

The argument *ab incredibilitate* is always to be received with caution when the thing to be proved is physically possible and is vouched for by many witnesses of unimpeachable character testifying from personal knowledge.

In this case the thing to be proved—the invention of the electric speaking telephone—was physically as possible on Drawbaugh's part as on the part of any other man, although it was not known to be possible until actually achieved by somebody. It was as possible of Drawbaugh as of Bell or Gray. Bell testifies that he himself was hindered and embarrassed by poverty and by the incredulity and opposition of his financial backers, Hubbard and Saunders. The proof shows conclusively that Drawbaugh's financial situation was much more serious than Bell's, and that his distress extended through a much longer period. It also shows that Bell did not experience a tithe of the incredulity that Drawbaugh suffered at the hands of timid financiers. There is, therefore, no greater incredibility in the facts stated and proved on behalf of Drawbaugh than in the facts stated and proved on behalf of Bell. In view of this fact, we submit that the immense array of testimony proving Drawbaugh's prior claim is to be received with its full probative force, just as a similar array of evidence would certainly be received in any other case.

The following facts alone dispose of the whole argument:

FIRST. *The origin of Drawbaugh's telephones is to be accounted for.* When did they begin, if not as stated by Drawbaugh himself and the multitude of witnesses who confirm his story? In considering this question, let us look at the complainants' own testimony. Shapley and Landis swear that they saw instrument B at his shop on October 3, 1876, and prove that he then said he had already talked through it, and that it was going to revolutionize the world. *But he could not talk through B alone*, nor was B a transmitter, but only a receiver. What did he have for a transmitter? And how many did he have? And how long had he had them? These questions need an answer, but no answer can be found except in defendants' evidence. The complainants apparently expected to prove that Drawbaugh got his ideas at the Centennial, but he never was at the Centennial until after October 15, 1876 (Geo. Leonard, D. Vol. 2, p. 697, Ans. 14).

This was at least two weeks after complainant's witnesses swear that he had the telephones at his shop, to their personal knowledge, and that he claimed to have been talking through them. What transmitter had he used in thus talking through B? Was it F? *If so, he certainly had not gotten the idea of F from anything that Bell had done*, for F involved the great invention of the carbon transmitter, of which Bell is shown to have had no conception. Was it C or I? If so, he had not gotten the idea from Bell, for they were magneto-telephones, *polarized by permanent magnets*, and Bell did not make that invention till November, 1876, nor publish it till January, 1877. Was it A? If so, that is a "highly organized" machine, as the complainants admit in their Overland brief, and was far in advance of anything that Bell had produced at that date.

Was it another B? If so, that involves the assumption that he had another B, which is not proved, and also the admission that two instruments such as B could intelligibly transmit and reproduce articulate speech, which the complainants have made desperate efforts to negative. Then what was it? All the defendants' witnesses prove that F and B were, in the early stages of the invention, used together, the former as a transmitter, the latter as a receiver, and this fact must be considered as settled by the evidence. *Then, where did Drawbaugh get his idea of F, and when?* It involved the great invention of the carbon-transmitter, and its origin is to be accounted for.

We thus see that the complainants' own evidence raises a question which they cannot answer, except in such a manner as to confirm the defendants' case. And what are we going to do with that great number of defendants' witnesses who were never at Drawbaugh's shop after June 1, 1875, but before that date saw and talked through not only B and F, but also C, I, A, D and E?

SECOND. The testimony of Hon. Richard J. Haldeman and his wife demonstrates conclusively that, in the summers of 1868 and 1870, Drawbaugh had electric talking machines for transmitting articulate speech to a distance. Mr. Haldeman saw the instruments and the wrapped wires extending from the shop window to some building outside, and was convinced from what he saw and heard that the problem was solved. His wife says that he told her, in the summer of 1870, that on his visit to the shop in 1868 he had actually talked through the instruments, although, when he was on the witness stand he had himself forgotten whether he talked through them or not. Undoubtedly his statement to his wife in 1870 is to be taken as correct.

The evidence of these two witnesses having thus established the great facts that the invention of Drawbaugh was an electric telephone for transmitting articulate speech to distant points, and that it was made before 1870, it only remained to show what the early instruments were. This proof is supplied in the testimony of such witnesses as Emanuel K. Gregory, who assisted Drawbaugh in his experiments between March and December, 1870, and was never in the State of Pennsylvania after the latter date till he was called there to testify in this case. He identifies F and B positively as the instruments which he then assisted to operate on many different occasions, and testifies positively to their successful experimental operation. These three witnesses, therefore, Mr. and Mrs. Haldeman and Emanuel K. Gregory, whose testimony cannot be doubted or questioned, establish the date at which the instruments seen by the appellees' witnesses, Shapley and Landis, on October 3, 1876, came into being. And these witnesses are fully corroborated by several hundred other equally reliable witnesses.

Is there, or can there be, any answer to this unprecedented array of positive evidence?

THIRD. Outside of the positive evidence of the instruments, their character and their successful operation, it is abundantly proved that all along from about 1870 or 1871, Drawbaugh was constantly declaring to people of all classes and conditions that he had invented talking machines which transmitted speech to a distance—any distance, he was in the habit of saying—by electricity; was inviting all classes of persons to examine the machines and witness their operation; was seeking the aid of capital to patent and introduce the invention; and was declaring it completed and successful. These declarations and acts are proved facts, and are to be accounted for. How can they be explained consistently with human reason and the laws of evidence, except upon the appellants' theory of the case? In the face of *such* facts, what force is there in the mere groundless assertion of appellees that the instruments *must* have been incomplete or unsatisfactory, or else he would have patented and introduced them? The very facts, themselves, negative this far-fetched inference, and establish the counter-inference that there was some other controlling factor that prevented him from carrying out his plans, and suggest that it was because the capitalists whese aid he sought failed to come to his relief. The testimony of Major Snyder (D. Vol. 2, pp. 513-4) and his son (Add. Proofs, p. 160) and neighbor, Mr. Eby (Add Proofs, p. 179), is conclusive of the fact that such aid was sought before June 19, 1873. The whole evidence shows conclusively that this is the correct explanation of the failure of Drawbaugh to patent and introduce his telephones long prior to Bell.

EXTRAORDINARY METHODS ADOPTED BY APPELLEES IN MAKING UP THEIR CASE.

The extraordinary methods of the complainants in prosecuting this case ought to be looked into and strongly condemned by the court. The most unscrupulous means have been resorted to at every point to prejudice the defendants and mislead the court.

1. As early as October 22, 1880, as we learn from their agent's (Harris) letter of that date, (C. Vol. 1, p. 480) they entered upon a deliberate plan of tampering with witnesses for the purpose of modifying or affecting the testimony which they might afterwards give.

2. They pursued this plan to the very end of the case, importing at the last extremity a new and more skillful agent from Boston, to carry on the work with the ram witnesses at and around Marysville. This effort with the ram witnesses is fully discussed in our Appendix A, where its outrageous character is strongly shown. They employed every means within their power to mislead the defendants' witnesses after they had left the stand, and to get them to return and change their testimony—arguing the case with them, reading them garbled evidence, misrepresenting the proofs, appealing to their sympathies,

and leaving no stone unturned to effect their object. These facts are clearly established by the evidence, and it is probable that we are not informed, as yet, of one-half of their work in thus tampering with our witnesses.

3. They attempted to palm off upon the court an incomplete copy of Wing's History of Cumberland County, as evidence that the work contained no reference to Drawbaugh's telephone invention, when they must have known that the complete work *did* contain such reference.

4. They, in like manner, attempted to palm off upon the court a statement purporting to be made up from the County records of Cumberland County, as evidence that no footbridge was repaired or rebuilt on the Yellow Breeches Creek in 1873; when they perfectly well knew that the county had nothing to do with footbridges, and that the absence of any allusion to them in its records meant nothing. Their agent, John C. Comfort, a resident of Cumberland County and dwelling on the banks of the Yellow Breeches (see Map, in evidence), could not have been ignorant of the fact that footbridges were township property, nor of the fact that the great flood of 1873, which they tried to disprove, actually occurred as alleged by the defendants' witnesses. (See Appendix B at the end of this brief.)

5. They undoubtedly misled their witnesses, Joseph Ditlow and Abraham Ditlow, as to the date when those witnesses first knew of Drawbaugh's talking machines, by exhibiting to them a railroad shipping receipt, dated in 1877, when they must have known at the time that the railroad books would show the box to have been shipped in 1874. (See tesfimony of Isabel and Harmon Hardesty, D. S-reb. pp. 483 and 493.)

6. When interviewing the Ditlows, in Indiana, upon

being assured by one of them that he had seen some instrument which they produced, they tried to influence their memory by declaring that it never was in Drawbaugh's shop at the time stated to them by the witness. (See Joseph Ditlow, D. S-reb., p. 523, Ans. 17.) And they instructed both of these witnesses *how to put things positively in giving in their evidence.* (*Id.* Ans. 20.)

7. They deliberately rejected all witnesses who assured them that they had knowledge of Drawbaugh's talking machines prior to October, 1876, and, after receiving such assurances again and again, went on in their work of trying to deceive the court as to the fact.

Not only so, but after having learned, through their agents, that David Stevenson, Jr., and the Gregorys would, if called, testify strongly in favor of Drawbaugh's priority of invention, they deliberately charged, in their argument in the court below in the People's Tel. Co. case, that these witnesses would, if called, testify against Drawbaugh, and urged the court to regard the fact of their not having been called and examined as conclusive against Drawbaugh.

8. They refused to allow Orlando Kahney to return and correct his testimony, although he applied to them for the privilege of so doing.

9. They refused to allow James P. Matthews to return and correct his testimony, although he applied to them for the privilege of so doing, and wrote them that, "*My recollection of the whole transaction is so vague that*
"*I never ought to have ventured to say anything about it,*
"*and the portions of my testimany relating to this matter*
"*certainly ought not to be considered by the court when*
"*making up its decision.*" (Add. Proofs, pp. 776–780.)

It is not too much to say that, where a party is shown to have thus been engaged in the work of suppressing evidence, introducing garbled books, and tampering with witnesses, their entire case is to be regarded as strongly suspicious. Who can tell how the testimony which they have introduced has been affected by such efforts, or how much of it is free from the effects of this kind of work? What confidence can we have in any of it?

We have now concluded our examination of the complainants' attempted answer to the Drawbaugh case. We have shown first, that the ingenious theory with which they started out, viz., that Drawbaugh's ideas were derived from Bell, and that the history of his talking machines should commence in the fall of 1876, is disproved by some of the very witnesses, Jacob Evans, Orlando Kahney, Joseph Ditlow, Abraham Ditlow and others, who were called to sustain it; secondly, that their negative evidence is not worthy even of serious consideration, and is, in respect to the majority of their witnesses, specifically rebutted; thirdly, that their attacks upon the dates fixed by a few of the Drawbaugh witnesses resulted in a most ignominious failure; fourthly, that, having failed in all these efforts to meet the defendants' case, they are remitted simply to inference and argument as to the alleged improbabilities of the case; fifthly, that these inferences and arguments, when examined, are found to be utterly inconclusive and worthless, based for the most part upon mere assumption and not upon proof, in other particulars ignoring the evidence, and in still others misrepresenting it; and sixthly, that their methods in working up their case and putting in their evidence were such as to destroy all confidence in anything they have brought before the Court.

A fair and candid review of the evidence on both sides, in accordance with the settled principles of law, shows that the defendants have established their case by proofs so overwhelming as to be probably unprecedented in the history of patent litigation.

With the facts now before us, let us again recur to the law and see whether the defendants have not, in the language of the Supreme Court in *Coffin* v. *Ogden*, brought themselves within its most rigid tests.

Comparing the facts here proved, for example, with the facts proved in *Coffin* v. *Ogden*, we find that in *Coffin* v. *Ogden* the original machines were not produced; here they are offered in evidence; in *Coffin* v. *Ogden* the whole defense rested upon the testimony of four witnesses, swearing to the facts from memory alone, after the lapse of about eight years; here the facts are proved by about two hundred witnesses and by the instruments produced in court; in *Coffin* v. *Ogden* only two or three machines were shown to have ever been made by the inventor, or by his procurement; here a large number of machines are shown to have been made; in *Coffin* v. *Ogden* the inventor's work all took place within about six months, and then ceased forever; here the inventor's work has never ceased from its commencement to the present moment; in *Coffin* v. *Ogden* the inventor was shown not to have patented his invention, nor made any effort to patent it until at least two years after it had been patented to another; here the inventor is shown to have made continuous efforts to get capitalists to interest themselves in the invention, and to have failed only through their lack of judgment. In the language of Bell's attorney to Draper, if they had taken hold of it they would not now need to be manufacturing other things, or troubling themselves about financial matters. In *Coffin* v. *Ogden* there was no clear proof that the invention had ever been used, even experimentally; doubtful evidence seemed to show that it had been for a few days exhibited on a door at Jones, Wallington & Co.'s shop, but not that any use was made of it, either practically or experimentally; here the evidence of scores of witnesses shows that the invention was successfully operated in their presence and by themselves; in *Coffin* v. *Ogden* a mere reproduced machine, made from memory eight years after the original invention, was held to be conclusive evidence that the invention would have operated successfully if it had been put to practical use; here the original anticipating machines are put in evidence, and some of them are admitted even by the complainants' experts to be such as might have been successfully put on the market for business purposes, and are further admitted by complainants' counsel in their Overland brief to be "highly organized" instruments, containing most of the refined improvements of detail found in the best commercial instruments of to-day. In *Coffin* v. *Ogden* there was no patent upon the anticipating invention; no attempt to patent it till years after it was patented to another, and then only an unsuccessful application, probably rejected upon the patent thus granted to another; no manufacture; no attempt to manufacture; no use for practical purposes; no exhibition except for a few days upon one door; no proof of its use for locking even that door; no production of its instruments in court, nor any original models or drawings of them; no publication; no proof of poverty or other reasons for not patenting; no evidence of any kind except the testimony of the inventor and three other witnesses; nothing except oral testimony that one lock was made eight years previous to the suit, and two or three months prior to the invention of the patentee, and that one or two locks were made a few months after the invention of the patentee. Yet, upon this state of facts, both the Circuit court and the Supreme court of the United States held the defense fully made out, and the Supreme court said that, although every reasonable doubt should be resolved in favor of the patent, the defendants had brought themselves within the most rigid requirements of the law in that behalf.

And they reaffirm *Gaylor* v. *Wilder*, where it was held that, although the alleged anticipating invention had never been manufactured for sale, nor patented, nor attempted to be patented, nor advertised, nor mentioned in printed publications, nor shown to the public, nor tested even experimentally for the purposes for which it was designed, nor claimed at the time as an invention, nor produced in court, nor preserved by the inventor; and although the inventor, after keeping his papers in it a while, had thrown it aside and procured another and different safe; yet, if it ever had existed, and the memory of its existence was still within the mind of any living man at the time when the subsequent patent issued to another, this subsequent patent was void—an able minority of the court holding that the subsequent patent was void whether the memory of the anticipating structure remained in the mind of any person when it was granted or whether it did not.

Other authorities light up our course to the proper conclusion in this case. In *The North-Western Fire Extinguishing Co.* v. *The Philadelphia Fire Extinguishing Co.*, 6 O. G. 34, 1 Banning, 177 (McKennan, J., April, 1874), suit was brought upon the *Carlier and Vignon* patent, of April 13, 1869, and defense was made that Dr. Graham, of Virginia, was the original and first inventor. It was shown in defense that Dr. Graham made the invention in 1837, and applied for a patent November 23, 1837, but was rejected through the stupidity of the government officers; and that, in 1843, he made an experimental trial of his apparatus, which resulted in reducing but not extinguishing the fire. The original apparatus remained, and was in evidence. The court said:

> "It was urged, however, that the efforts of Dr. Graham are to be treated as abandoned experiments. An experiment may be a trial either of an incomplete mechanical structure, to ascertaln what changes or additions may be necessary to make it accomplish the design of its projector, or of a completed machine *to illustrate or test its practical efficiency.* Obviously, in the first case, the incompleteness of the inventors efforts, *if they were abandoned,* would have no effect upon the rights of a subsequent inventor.
>
> *But if the experiment proves the capacity of the machine to effect what its inventor proposed, the law assigns to him the merit of having produced a complete invention.*
>
> It is hereinbefore shown that the theory of Dr. Graham attained this practical condition; and there, apparently, his efforts ceased. But why? Repulsed from the Patent Office by the arbitrary assumption that his enterprise was impracticable with the employment of any mechanical auxiliaries whatever, without pecuniary resources, his 'poverty, not his will, consented' to an abandonment of further effort to secure the full benefit of his invention to himself and to the public. *But this will not help the complainants.* The most that can be predicated of his inaction is that he abandoned the invention to the public, although I do not affirm this hypothesis. But if he did, it will not reduce his matured invention to the grade of a mere experiment, and open the way for the complainants to appropriate the title of first inventor."

Language could hardly be stronger than this; and it is also a significant fact that, although the invention had been in the most public and notorious use throughout the world in the form of the "Babcock Fire Extinguisher" and other similar machines for many years, yet Congress, four years after this decision, granted to Dr. Graham's heirs a broad patent for his original invention, thereby evincing their opinion also as to his priority of invention over all others being exclusively established by the facts cited.

In no one of the above cases were the facts established with half the probative force of the evidence which proves Drawbaugh's prior invention and perfection of the electric speaking telephone.

A BRIEF REVIEW OF JUDGE WALLACE'S TWO OPINIONS IN THE COURT BELOW.

Judge WALLACE decided the case of *The American Bell Telephone Co. et al.* v. *The People's Telephone Co. et als.*, on December 1, 1884. Subsequently, in the *Overland* case, further testimony was taken as to Drawbaugh's prior invention, and, by stipulation, this was introduced as additional evidence in the case of *The People's Telephone Co.*, and a rehearing was asked thereon. This application was heard, and, upon such further evidence, Judge Wallace again found for the complainants, in an opinion filed by him December 4, 1885. His first opinion is printed in D. Add. Proofs, immediately following p. 764; his second opinion occupies pp. 765, 766.

It may be fairly assumed that these two opinions, written by a judge presumably fair and intelligent, present the strongest argument that can be made against the Drawbaugh claim of priority of invention. The other arguments to which we have replied in the earlier parts of this brief, are the arguments of counsel deeply interested in maintaining their theory of the case and strongly affected with partisan bias; this, on the contrary, is presumably the argument of a disinterested judge endeavoring to give a fair reason for his opinion adverse to the defendants below.

But the argument of a court, like the arguments of counsel, must stand or fall upon its inherent fairness, logic and agreement with the evidence.

Tested by this rule, it is not too much to say that the opinions of Judge Wallace in this case are, to a most extraordinary degree, oblivious of proved facts, illogical and inconsistent; and that, if this was the best that could be said in answer to the Drawbaugh case, it was equivalent to admitting that no fair and logical answer can be made to it.

First. Its mis-statements of proved facts are simply astounding.

Take, for example, his assumption that the biography of Daniel Drawbaugh which appeared in Wing's History of Cumberland County, in the spring of 1879, was composed by Daniel Drawbaugh himself. Judge Wallace not only assumes this to be the fact, but, basing his reasoning thereon, he proceeds to find Drawbaugh to be a vain, egotistical, silly person, who ought not to be believed on oath, and whose "autobiography" "suggests the charlatan." The assumption as to the authorship of this document seems to be the key-note to the whole theory of the learned judge's decision.

When Judge Wallace wrote the scathing denunciation of Drawbaugh for his assumed authorship of the biography, there lay in the judge's desk, among the exhibits in the case, *the original manuscript of this biography, proved by the appellee's witness, Nesbit, and admitted by the appellee's counsel, in argument, to be in the handwriting of Mr. Hull, the publisher's agent, for collecting historcial information for his book, and admitted to be the original manuscript of the biography!* (See Mr. Storrow's printed argument in the court below, bottom of page 116 and top of page 117.) Mr. Hull died in the spring of 1879, about the time when the book appeared, and this manuscript was found among his papers after his death. (And see *ante*, p——).

Of course, this fact disposes of Judge Wallace's whole arraignment of Drawbaugh, which is based upon the gross mistake as to the authorship of the article in question.

Such a mistake ought never to have been made. The internal evidence of the article itself should have guarded the court against it. *It was written by a person who did not even know Drawbaugh's age, and leaves the year of his birth a blank!* Its fulsome compliments show at a glance that it is the work of a penny-a-liner. It had been proved by the witnesses in the case, *on both sides*, that Drawbaugh was a singularly modest, diffident, honest and truthful man; and this evidence should not have been overlooked, but his character, proved as an element of the case, should have been taken into consideration. (See *ante*, pp.——).

Through all his adversity; when he was utterly unable to meet his debts or obligations; when he had to borrow money to support his family, and was unable to repay it for years; when his creditors were dogging him from day to day and hour to hour, unable to get anything but promises to pay when he should be able; when the tax collector, from motives of humanity, was paying his taxes out of his own pocket and waiting years for their return; when judgments and executions were issuing against him; such was the known honesty and truthfulness of his character that even his creditors never lost confidence in his integrity nor in his word. What other man could have successfully stood such a test as this? What higher proof of character could be offered?

We submit that this proved character should have been made a controlling element of the judge's decision, and that it was gross error to disregard it.

Take, as another example, Judge Wallace's statements as to Drawbaugh's property, which are entirely wrong in very important particnlars. As an illustration of this fact, Judge Wallace states that "From 1867 to April, "1872, he was the owner of real estate, for which he "had paid $2,300 in the fall of 1867, and upon which he "expended in improvements, in the spring of 1868, from "$300 to $400, and which was encumbered only by a "prior lien for $300. In the spring of 1872 he encumbered it for $1,000, not as a principal, but as a "surety." Nothing could be more misleading than this statement.

The following statement, collated from the records of the Court of Common Pleas of Cumberland county, Pensylvania (see Defendant's People's Co. Record, Book of Exhibits, pp. 26-74), shows the state of liens upon Drawbaugh's Milltown property, from the date of its purchase, in the spring of 1868, to the date of its sale, in April, 1876:

April, 1868, to May 3, 1869, $310.00, interest and costs.

May 3, 1869, to March 26, 1870, $1,810.00, interest and costs.

March 26, 1870, to May 17, 1871, $910.00, interest and costs.

May 17, 1871, to November 17, 1871, $970.00, interest and costs.

November 17, 1871, to January 11, 1872, $910.00, interest and costs.

January 11, 1872, to February 10, 1873, $1,910.00, interest and costs.

February 10, 1873, to March 17, 1873, $2,022.67, interest and costs.

March 17, 1873, to July, 1873, $2,115.49, interest and costs.

July to December 13, 1875, $1,805.49, interest and costs.

December 13, 1875, to April , 1876, when house was sold to Fettrow, $1,833.30, interest and costs.

There was also a judgment note outstanding against him from and after April 1, 1869, for $1,000.

To assume that he could have raised any money upon a property so encumbered is simply absurd; while to assume that he should have tried to sell the property before his judgment-note creditors could record their lien, is simply to assume that he should have shown himself a thorough scoundrel, which was totally foreign to his nature.

Again, Judge Wallace's bare schedule of his receipts during the years 1869, 1870, 1871, 1872, 1873, 1874, 1875 and 1876, without considering the load of debt under which he was struggling all the while, is manifestly unfair and unjust. Without debts, the amount of his receipts was hardly adequate to the support of his large family, with the sickness and death that intervened in those years. But with creditors pressing upon him for old debts, watching closely for any expected accession to his funds, dogging him for their dues and threatening to take his home from him, the amount of his slender receipts was hardly sufficient to keep the wolf from his door; and his testimony that the financial pressure upon him continued to grow greater and greater all the while, is, beyond all question, the melancholy truth. No review of his meager assets which does not also take into consideration his debts and the constant pressure upon him for money is either adequate or just.

Mrs. Drawbaugh's testimony in the Overland case (Add. Proofs, pp. 221–233) conclusively confirms all his statements about his constant poverty during those years, and also shows that in addition to and explanation of his adversities, he lacked every quality of a skillful business man, and that his total absorption in his great invention contributed materially to his unfortunate financial condition. These facts should all have weighed heavily in any just judgment upon the case, but they appear to have been utterly overlooked by Judge Wallace.

The entire theory of Judge Wallace seems to have been founded upon—first, upon his erroneous assumption that Drawbaugh composed the biography found in Wing's history; secondly, upon his erroneous assumption that Drawbaugh overstated his poverty during the years 1869–1880; and thirdly, upon his entire disregard of the overwhelming evidence as to Drawbaugh's character for honesty, truthfulness, modesty and sincerity. He confessedly could not find for the complainants below without attacking and disposing of Drawbaugh as a witness, and he could do this only by utterly unfounded and erroneous assumptions, in conflict with the fullest and clearest evidence in the case.

Second. Judge Wallace then goes out of his way to attack even the appellants and their counsel. He says, in substance, that they concocted this plea of poverty, formulated it in the answer, elaborately fortified it by witnesses and caused it to be testified to by Drawbaugh.

A more unfounded and unjust assertion never was judicially made, and it is flatly contradicted and disproved by one of the appellees' witnesses, *James P. Matthews*, upon whose testimony Judge Wallace expressly relies in another part of his opinion, although Mr. Matthews had written a letter, which was before the court, stating that no reliance whatever was to be placed upon his recollection of the facts thus cited by the court. Mr. Matthews was at Drawbaugh's shop in April, 1878, to examine his electric clocks, and wrote out and published an account of the visit in November, 1878, in the course of which he stated, from information casually derived from Drawbaugh during his visit, that nothing but Drawbaugh's *poverty* prevented him from anticipating both Bell and Edison in the invention of the telephone! (C. Vol. 1, p. 543.) This article, published in November, 1878, from information obtained in April, 1878, *two years before the appellants ever heard of Daniel Drawbaugh*, shows that the "theory of constraining poverty" was *not* originated by appellants or their counsel, but was the explanation given by Drawbaugh himself to the witness for the Bell Telephone Company years prior to the institution of this suit. Comment is unnecessary.

Third. The inconsistent and illogical character of the reasoning of the court below next demands attention. Facts of the utmost importance are admitted, in one part of the opinion, to have been conclusively proved, only to be utterly disregarded at all other parts of the opinion. Thus the court says:

"The proofs leave no room for fair doubt that defendants' contention is substantially true, or that the defense has no foundation in fact. It is either true that Drawbaugh had long been treading his solitary path of investigation and experiment in poverty and obscurity, but had perfected his work when the inventions of other explorers were in embryo, or his story is an ingenious fabrication." * * *

"Thus Drawbaugh is corroborated by a cloud of witnesses whose testimony tends to substantiate his narrative. Without stopping at this point to consider the credibility and probative force of their testimony, it suffices to state that, although some of the witnesses seem to have been reckless and unscrupulous in their statements, *the great body of them are undoubtedly honest witnesses*." * * *

"*The case made by these witnesses is sufficiently formidable to overcome the legal presumption of the validity of the complainants' patents.* * * * Of necessity the testimony of most of the defendants' witnesses can only be attacked *by showing that the witnesses are mistaken as to the time* when they saw Drawbaugh's talking machine, *or as to what they really saw on the occasions they refer to.*"

And then, does the court proceed to show that this great body of honest witnesses, whose testimony is admittedly sufficient to overthrow the Bell patents, *were* mistaken as to the time when they saw Drawbaugh's talking machines, or as to what they really saw? *Not at all*—but, only stopping to pick a flaw in the testimony of Nichols, one witness out of over two hundred, the court proceeds to beg the whole question, by stating that—

"In cases where such a chaos of testimony exists, it is usually found that the judgment is convinced by a few leading facts and *indicia*, outlined so clearly that they cannot be obscured by prevarication" (of honest witnesses?) "or aberrations of memory. Such facts and *indicia* are found here, and they are so persuasive and cogent that the *testimony of a myriad of witnesses cannot prevail against them.*"

Here the facts are admitted that the great body of

Drawbaugh's witnesses are truthful and honest; that their evidence is amply sufficient to overcome the validity of the Bell patents; and that it can be met *only by showing that they were mistaken in their dates, or as to what they saw;* but it is asserted that a judge, in his discretion, may absolutely disregard the testimony of a *myriad* of such witnesses, if, for any reason, he thinks their story improbable or discovers any outside unexplainable fact which he regards as inconsistent with it!

Fourth. Then the court sets forth, in order, the fact which it deems conclusive to overthrow the positive testimony of even a *myriad* of honest witnesses, *in a telephone case.*

The *first* is that Drawbaugh wrote a biography of himself *which,* as we have shown, *he did not write.*

The *second* is that he was a "skillful and ingenious mechanic," who had taken out numerous prior patents for "improvements" in various machines, but never on a great invention like the telephone! In this connection, the court reviews, in a manifestly unfair and prejudiced spirit, some of Drawbaugh's other inventions, to show that some of them were unimportant and others mere discoveries of old things. On this rule, it is as easy to prove that Bell could not have invented the telephone as that Drawbaugh could not. Bell's multiple telegraph is a known failure. He re-invented Page's old discovery of a musical sound in an empty helix when a broken circuit of electricity is sent through it, and thought it a great and wonderful discovery of his own. He re-invented the old *autograph telegraph* of Bonelli, and believed himself the author of it for awhile. Every prolific inventor re-invents old machines and devices, as well as invents many new devices not particularly useful. The most of Drawbaugh's inventions were new, and many of them were useful and valuable to their owners, although he never derived much profit from them. The appellees' witness, Weaver, resorted to him in 1867 to invent a tack machine, because he was a man who could invent *anything*; and he was not disappointed, for Drawbaugh immediately produced the tack machine that others had striven unsuccessfully to devise!

The *third indicium* which impressed the court below as unanswerable was, that the telephone was a difficult thing to invent, and therefore it must be conclusively presumed that Drawbaugh could not invent it!

Again, that Drawbaugh could not, in 1882, set forth in order the long series of experiments, reasonings and investigations which he made between 1859 (see testimony of Prof. Heiges) and 1866, through which he arrived at the conception of the unbroken, variable or "undulatory" current, and at the first machines in which he embodied this conception.

It would, indeed, be surprising if he *could* remember such steps. The idea must have dawned upon him little by little, as he explored multitudes of different paths, some of which, in the nature of things, must have tended to lead him away from the true direction, and some towards it. The true conception of the right way to attain the desired result would necessarily be a thing of slow and almost imperceptible growth and development, even to the inventor himself. Even the first instrument which he produced—the old teacup transmitter of 1866—he says, did not solve the question, but only gave such results as to indicate that he was at last on the right path. He used different forms of receiver with it, but cannot remember their exact details of construction, until he comes to the first form of Exhibit B. But when the first operative instruments, F and B, were produced, about 1867 and 1868, there is no longer any uncertainty about his memory. The steps were now not merely mental and experimental, but visible and tangible, and the results were such as to impress his memory for all time.

Suppose we pause to compare, for a moment, Drawbaugh's simple and evidently truthful statement of his present inability to recall in detail the steps which led his mind up to his great discovery, with the astounding fact that Bell heard his first *speech* or *sound* through Gray's transmitter, on March 10, 1876, and had a written memorandum made of the fact and date, and yet, in his London lecture, delivered in the fall of 1877, and in his testimony in the Dowd case, given in 1879, *totally forgot to mention the great fact*, and actually attributed his first hearing of speech through a telephone to his *own* telephones of April, 1876, which had the armature made like a thumbnail and shellacked upon the center of the diaphragm! Shall we reject, as incredible, Drawbaugh's inability to remember his early mental steps and reasonings in the years from 1859 to 1866, and at the same time swallow, as perfectly credible, the astonishing story that Bell in a year and a half, forgot all about having gotten his first speech through Gray's transmitter on March 10, 1876!

The *fourth* fact that seemed to Judge Wallace to outweigh the testimony of two hundred witnesses, was that Drawbaugh did not bring his telephone to the knowledge of Keifer, Wilson, Houck, Stees, Lloyd, and the members of the old Faucet or Pump company.

As to *Keifer* and *Wilson*, Drawbaugh had very little acquaintance with either of them. *They were never at his shop prior to this suit.* He seems to have called upon them at Harrisburg *only to beg old scraps of wire and other refuse materials that he might be able to use in his experiments*—a fact which speaks volumes as to his poverty at the time. If he mentioned his talking-machine they probably took little notice of it, and the fact soon passed out of their memory. If they received his statements with indifference or derision, he was so sensitive a man that he would never have referred to it again in their presence.

As to *Lloyd*, he has undoubtedly grossly exaggerated his alleged intimacy with Drawbaugh. He never was in Drawbaugh's house; nor was Drawbaugh ever in his, except to call twice at his office on business. (C. Vol. 2, p. 1274, Ans. 86; p. 1275, Ans. 92.) He never was even at Drawbaugh's shop but five times, to wit: once about 1866 or 1867, on business (see his answers, 4–7); once again, about the same time, on business (Ans. 8–12; Ans. 80); once again, about 1871 or 1872, to see the nail machine (Ans. 80);* once again, in 1875 or 1876, on business, to get a glass lens ground (Ans. 35–41; Ans. 27, 75), and once with Worley, in 1878, to see the electric clock. (Ans. 52, 96.) At the latter visit, Drawbaugh showed them a *new* telephone that he was inventing, and incidentally mentioned some difficulty in it which he was trying to overcome; but his statements were such as might be made about any new telephone he is inventing *to-day* and prove nothing as to his prior completed instruments. He did not mention his earlier instruments, nor mention this as his first (Ans. 113, 106, 102–113). One of Drawbaugh's calls at Lloyd's house was to borrow ten dollars (Ans. 44), which is about the only evidence of intimacy disclosed in the witness' deposition. The whole deposition is entirely negative in character, and would not affect the testimony of even a single positive witness. Neither Keifer nor Wilson swear positively that Drawbaugh never mentioned his telephones to them when he called at their offices to get old scraps, but simply that they do not *remember* that he did.

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*Note.—The nail machine was always kept in the cellar, and would not lead any visitor to that part of the shop where the telephones were.

As to *Houck, he is a convicted perjurer* (C. Vol. 1, pp. 823–826), who attempted to steal Drawbaugh's new faucet invention and bolster up the theft by perjury, in 1879, but was defeated in the effort.

As to *Stees*, Judge Wallace says:

> "Mr. Stees was the superintendent of a car company at Harrisburg, having shops in different parts of the city, connected by telegraph lines. He was the first person to employ Bell's telephone on these lines, when they were introduced into Harrisburg, late in 1877 or early in 1878. He was a friend of Drawbaugh, and Drawbaugh would naturally have applied to him if he wanted to test his telephone publicly and practically."

And that is exactly what Drawbaugh did, as we learn from the testimony of young Stees (*Additional Proofs*, pp. 209–220), Johnson (Id., pp. 198–209), and Drawbaugh (D. Vol. 2, pp. 1047, 1049, Ans. 1376, 1393).

As to the old *Faucet Company*, we have produced the evidence of their employes, Joseph and Emanuel K. Gregory (Additional Proofs, pp. 181–196); Schrader (D. Sur-rebuttal, pp. 467–471); Hoffman (D. Vol. 1, pp. 481–484); all of whom testify positively to their knowledge of Drawbaugh's telephones at that time, and two of whom (E. K. Gregory and Schrader) testify to the very details of the experiments and instruments, and identify the latter. We have also the affidavit of Dr. Mosser, the secretary and treasurer of the company (who died before his testimony could be taken in these cases) which will be found in C. Vol. 2, p. 1146, which is corroborated in part by the deposition of Prof. Heiges (D. Sur-rebuttal, pp. 95–103). We have also the deposition of William R. Gorgas, the president of the faucet company, an old man, who states that at one time Drawbaugh desired him to take a half interest in some invention and furnish the money for patenting it, but as he, Gorgas, was losing $4,000 in the faucet business, and "had a surfeit" of patents, he paid no attention to the matter (D. Surrebuttal, pp. 1128, 1129). Thus, the evidence of the faucet company, and their employes, *does* corroborate Drawbaugh, and in the most positive and conclusive manner, Judge Wallace's comments notwithstanding. The learned judge seems to have read only the complainants' brief, and to have neglected the *evidence*.

But why should the court pick out *certain individuals* and say that the unexplained fact of Drawbaugh's not having presented his telephone for *their* consideration negatives the positive testimony of hundreds of witnesses that he had it, and the testimony of numerous capitalists that he tried to interest them in it and get them to furnish the money for patenting and introducing it into use? What rule of evidence authorizes so extraordinary a conclusion?

Fifth. The court refers to three instances of what it terms Drawbaugh's "*declarations*," which it considers of such importance as to outweigh the testimony of a "myriad of witnesses," viz: his business card, printed in 1875; his testimony in the Houck interference, given in June, 1879, and his alleged statements to James P. Matthews, in April, 1878. But, when these "declarations" are examined, they will be found to be, not "declarations," but only the *absence* of declarations.

The *business card* merely gives a list of *some* of his inventions, omitting, as we have already shown (*ante*, pp. 253-257), *at least eight besides the telephone*, all of which he is known and admitted to have made before 1875. It is not what the card *states* but what it *omits to state* which impressed the court below; yet its omission to state the other eight inventions does not in any way disprove their admitted existence, and it certainly can have no greater probative force as to the omitted *ninth* invention.

The *interference testimony* incidentally alluded to the telephone and phonograph, and only incidentally. Mr. Drawbaugh was not questioned about the talking machine, but, in referring to a faucet sketch which was put in evidence his memory apparently associated it in some way with some particular telephone or phonograph experiment made between 1874 and 1876, which mental association enabled him to fix the date of the faucet sketch. Nothing more than this can fairly be inferred from his merely incidental allusion to the telephone.

The *Matthews interview* was on the subject of electric clocks. Matthews understood little or nothing of electricity, and grossly misunderstood and misdescribed even the electric clock itself to which his attention was mainly given. (See Drawbaugh, D. Vol. 2, pp. 1030 to 1040, Ans. 1516 to 1524.) The telephone was mentioned only incidentally and casually, and, beyond all question, Drawbaugh's remarks about it were also either misunderstood or misrecollected. Matthews himself, after he had left the witness stand, pricked in his conscience at the conviction that he had gone too far in attempting to state what occurred in reference to the telephone, wrote the counsel for the Bell Telephone Company, asking them to suppress the deposition, and saying that his memory of the matter was so vague and uncertain that no court ought to receive it as evidence; yet the court below makes this deposition one of the chief corner-stones in the structure of its argument against Drawbaugh's claim of priority!

Sixth. The court cites, as one of the conclusive "*indicia*," that the newspapers made no mention of Drawbaugh's telephone till 1878, although they had mentioned Bell's telephone. Is *that* a fact sufficient to outweigh the positive testimony of even *one* witness?

Seventh. Another of the "*indicia*" is, that Drawbaugh borrowed, for a few days, a telephone, of the "Phelps Snuff-box" form, as the judge states, "late in 1877 or early in 1878," and that this instrument resembled Exhibit A in external appearance.

First, the judge misstates the fact as to the time—it was late in the spring or early in the summer of 1878 (see Zeigler's test'y, C. Vol. 2, p. 1027, Ans. 17; p. 1035, Ans. 83.)

Second, the instrument "A" which Zeigler says is the one Drawbaugh brought to him at the time when he borrowed the Phelps snuff-box telephone, is proved *by complainants below* to have been in existence *months* before that time (Testy. of Geo. C. Rupp, C. Vol. 2, pp. 1122, 1128, Ans. 22, 27; A. L. Rupp, in whose family Geo. C. Rupp lived, C. Vol. 2, p. 1114, Ans. 24). Drawbaugh did not, therefore, derive "A," from the "Phelps Snuff-box."

Third, in view of the above facts, the only fair inference derivable from Drawbaugh's remark, as reported by Zeigler, is that he found his instrument "A," which he had made years before, now patented to another, and having no financial means to contest with so powerful an adversary, he feared that it was lost to him.

Eighth. Another of the "*indicia*" referred to by the court below, is the *negative* testimony as put in by the appellee. This subject is exhaustively discussed in Appendix C which follows this brief, where the appellee's negative testimony is shown to be completely nugatory, and to have broken down at all points. The court below was evidently impressed with the worthlessness of such evidence in general, but, referring to it in this case, states that: "What gives point and force to this testimony and parries the ordinary objections to the reliability of verbal declarations, is that these witnesses are persons who *would have been forcibly impressed*, because of *their interest in the particular subject*, by any assertion by Drawbaugh that he was the inventor of the telephone"!

It is a sufficient answer to this statement to say that it is a gross error—no *such person* is to be found among the appellee's negative witnesses!

Ninth. Another of the so-called "*indicia*" is found in the testimony of witnesses "such as Mr. Weaver and Mr. Grissinger, showing declarations of Drawbaugh made after the Bell telephone was in commercial use, to the effect that, although he experimented on the telephone years before Bell, he had obtained no satisfactory results."

Weaver and Grissinger are both shown by their cross-examination to have been personally hostile to Drawbaugh; and Weaver is shown to have been a disreputable shyster.

Their cross-examination, especially that of Weaver, shows clearly that Drawbaugh, in his alleged interview on the subject of the telephone, had his attention directed to his *first* telephone experiments—the old tea-cup transmitter—and was speaking only of the performances of his earliest instruments. These instruments Drawbaugh *testified* were not satisfactory; and it would be just as much in point to quote against him what he *testified*, as what he said to Weaver and Grissinger on the same subject. The court's error here consists in taking what he said about his *first* instruments as relating to all his instruments prior to 1876—an error which shows the danger of relying upon vague recollections of past conversations in answer to positive uncontradicted testimony.

Tenth. The court, after stating these various "*indicia*," makes the broad assertion that "the testimony of *many other* witnesses is overthrown by the *palpable improbability of their statements*, or by the *contradictions between their statements and those of other witnesses for the defendant*, or by *successful attacks upon their accuracy in the rebutting testimony of the complainant*."

It is well that the court did not cite the names of the "many other witnesses" here referred to, for it could easily have been shown that it was in the grossest error in the whole statement! With the exception of an error or two in *dates*, assigned by, at most, *two or three* witnesses, the statement is wholly unfounded; and these errors in dates are utterly immaterial because corrected by other of the defendants' witnesses.

This concludes our review of the court's "*indicia*." Each one of the "indicia" is clearly shown to be thoroughly worthless, when considered by itself, by an unprejudiced mind. A chain is no stronger than its links, no matter how long it may be. A dozen "indicia," each separately inconclusive, do not prove more than would be proved by one alone. To set up such worthless stuff as sufficient to answer the clear, positive, uncontradicted testimony of hundreds of disinterested witnesses, all testifying from personal experience and knowledge, is a perversion of the laws of evidence and the functions of a court of justice.

Still reviewing the opinion of the court below, we come, next, to a remarkable admission, to wit: that, notwithstanding all that can be said against Drawbaugh's claim to priority, "*no doubt is entertained that Drawbaugh was experimenting at an early date with telephones or phonographs;*" and the court then goes on to admit that these experiments began prior to 1869, and continued till after 1876.

In the earlier pages of the opinion, the court had said that:

> "It is either true that Drawbaugh had long been treading his solitary path of investigation and experiment in poverty and obscurity, but had perfected his work when the inventions of other explorers were in embryo, or his story is an ingenious fabrication."

But, if it be true, as conceded in the later part of the opinion, that Drawbaugh had been experimenting on telephones from a period prior to 1869 to a period subsequent to 1876, then his story is clearly *not* "an ingenious fabrication," but is founded upon admitted fact about which "no doubt is entertained," and the court should have accepted what it had itself stated as the only alternative, to wit: that he "had long been treading his solitary path of investigation and experiment in poverty and obscurity, but had perfected his work when the inventions of other explorers were in embryo." The court however refuses to accept its own alternative, and tries to explain away the admitted fact about which "no doubt is entertained."

This attempted explanation is so remarkable a piece of judicial reasoning that we shall give it the prominence which it deserves.

Briefly, it is this:

That, prior to May, 1869, Drawbaugh was probably experimenting on the Scott phonograph or phonautograph.

That, in May, 1869, a description of the Reis telephone was published in a New York newspaper, entitled "*The Manufacturer and Builder.*" "Whether other newspapers" copied the article or not, the court admits, "is not shown, nor is it shown that Drawbaugh saw the article in *The Manufacturer and Builder*. *It would be difficult to prove the circumstance if he did see it.*" Hence the court simply *assumes* that he saw it or "*some such publication,*" in the absence of all evidence to that effect, and in the teeth of Drawbaugh's testimony that he never knew of the Reis telephone till the fall of 1876.

Having these extraordinary assumptions in mind, let us now turn to an earlier page of the opinion, where the court, referring to all the Drawbaugh telephone instruments, says:

> "*That the talking machines referred to by the witnesses were* ELECTRIC *instruments is clearly established.* Drawbaugh testifies explicitly that they were always used with a closed circuit, and without breaking the current, some of them being battery telephones, and some magneto telephones. He always represented them as actuated by electricity to those to whom he explained or described them, and claimed his invention would supersede the telegraph. *His assertions show them to have been electrical instruments.*"

Citing, then, a list of witnesses two pages long, in support of the statement.

Now, then, these "talking machines" were *electrical* machines; but the Scott phonograph, or phonautograph, was *not* an electrical instrument—there was no electricity about it. The "probable" experiments with the Scott phonautograph, from 1863 to May, 1869 (which experiments there is not an iota of evidence to show were ever made, but all is mere assumption), do not, therefore, even if true, account for his *electrical* talking machine experiments during those years. *The attempted explanation thus breaks down at the very outset!*

But how was Judge Wallace led into the palpable error of attempting to account for experiments with an admittedly electrical talking machine, by supposing them to have been experiments on a *phonautograph?* We answer, that it was because, when he prepared and filed his opinion, he ignorantly supposed a phonautograph *to be an electrical machine!* Proof of this is contained in the opinion itself, as first filed on Dec. 1, 1884. A copy of the opinion, *as then filed*, is to be found in the *Additional Proofs*, pp. 394-427 (and see top of page 245). By reference to this original opinion (*Id.*, p. 423), it will be seen that it speaks of the phonograph, or phonautograph, as an electrical machine—"the electric mechanism of the phonograph." A few days afterwards, the original opinion disappeared from the files of the court, and a printed copy (printed in Boston) took its place; and in this latter opinion, the word "electric" is omitted before "mechanism of the phonograph."

The original opinion, with reference in it to a phonograph as an electric machine, would have been a laughing-stock to the scientific world, but would have suggested, at least, a *logical* explanation of Drawbaugh's electric talking machine experiments prior to May, 1869. The amended opinion is no longer a laughing-stock to the scientist, *but its logic is spoiled!* It now undertakes to account for Drawbaugh's electrical experiments by a hypothesis which "fails to connect." The court blundered into a ridiculous scientific error in trying to account for Drawbaugh's early electrical talking machine experiments, and then, discovering the awkward situation, blundered into an equally ridiculous *non sequitur*, in trying to get out of it!

Note once again the inconsistency and absurdity of the court's attempted explanation of Drawbaugh's talking machine experiments.

First, from 1863 to May, 1869, he is assumed, without a particle of evidence, to have been tinkering with a phonograph, which does not at all account for the proved electrical character of the experiments.

Then presto, change! He is assumed, *without a particle of evidence*, to have suddenly ceased his phonograph experiments and gone to tinkering with a Reis telephone, which the evidence shows he was totally ignorant of till the fall of 1876. But his telephones are shown to have *talked*, and the Reis telephone is assumed to be incapable of talking.

Presto, change, again! From the fall of 1876 to 1880, he is assumed to have been tinkering at the Bell telephone.

Yet, the entire uncontradicted evidence shows that the line of his talking machine work was a straight, unbroken line, beginning prior to 1866 and running right along without change in its general character. The machines which were seen at his shop prior to 1869, continued to be seen there till they were put in evidence in this case. They are proved to have been used for transmitting speech to a distance by electricity prior to 1869, and ever since. New machines from time to time appeared, but the old ones still remained, and the new ones were merely their outgrowths—their maturer developments.

Which is the more rational and consistent explanation of the admitted facts—that assumed by Judge Wallace, *in direct opposition to the evidence*, and which requires three abrupt changes of position, of which no hint is given in the testimony; or that given by Drawbaugh and corroborated by hundreds of admittedly honest witnesses? Nay, is not Judge Wallace's suggested explanation more incredible than anything to be found in the Drawbaugh case?

In the latter part of March, 1882, in the People's Telephone case, a test of the Drawbaugh instruments was made at New York, the instruments being the original D, E, A, H, &c., and reproductions of F, B, C and I. In this test all the original instruments proved themselves to be good, practical speaking telephones; but the reproduced instruments, while they transmitted words and sentences, did not operate so satisfactorily as the others.

These reproduced instruments, thus tested, were the identical reproductions that had been put in evidence nearly two years before. They had been shipped back and forth to New York, Philadelphia, Baltimore, Harrisburg, dozens of times; and had been taken apart and put together again by draughtsmen, witnesses, experts and counsel scores of times. They were shattered, dilapidated, loose, and in no condition to operate, whatever may have been their original condition. Yet they all talked, though as might have been expected, not perfectly. Judge Wallace, disregarding their shattered condition, held that, although they all talked, yet they did not talk so well as the witnesses had all testified that the original instruments talked at Drawbaugh's shop, and therefore he came to the extraordinary conclusion that all the witnesses had testified falsely!

In the Overland case, on February 6, 1885, (See D. Add. Proofs, pp. 247-310, 542-624; and see Prof. Barker's deposition, Id. pp. 6-35), a further test of reproduced instruments F, B, C and I, was made at Philadelphia. This time the reproductions were new, and in suitable condition for a practical test. The test was perfectly conclusive. All of the instruments transmitted and reproduced speech without difficulty, and in every respect their performances corresponded to what the witnesses had stated of the originals at Drawbaugh's shop.

Yet the court below, having ruled that the dilapidated instruments tested in 1882, gave the lie to the witnesses, refused, on rehearing, to pay any attention to the testimony of the new and undilapidated reproductions of February, 1885.

In assigning a reason for this strange ruling, the court grossly misstated the facts and the evidence. (See second opinion of Judge Wallace, Additional Proofs, pp. 765, 766.) First, it totally disregarded the performances of the new reproductions of B, C, and I, and threw the whole case upon the fourth instrument, F, although that was of no greater importance than any of the others. Secondly, it alleged that this instrument F contained a "new conducting material" not used in the former reproductions or instruments, and adapted to be adjusted in a new and different way—every word of which was gross error! The "conducting material" was powdered carbon alone, and carbon and bronze (See Id. p. 624; and Prof. Barker, Ans. 80, pp. 27, 28), which is exactly the material described by Drawbaugh in his evidence in the winter of 1881–2 (D. Vol. 2, Ans. 131, 1290, pp. 801, 999;). Prof. Barker testifies (Ans. 79, pp. 26, 27) that the instruments were exact and faithful reproductions of the original instruments and drawings. And, in answer to the judge's suggestion as to the adjustment of instrument F (by which he means that it was held in an inclined position, as described in the Hunnings patent), we have only to cite the testimony of Prof. Barker, who had these instruments at the University of Pennsylvania testing them privately for his own information, for several weeks before the public test in question, and who swears that the instrument F worked best when *not* held in the hand but "*allowed to remain fixed in one position.*" (Ans. 84, p. 28.) As a result of all his tests he states that "When once in adjustment, *if allowed to remain fixed in one position, they retain their adjustment very well;* but when disturbed, *as when the tumbler is taken in the hand and held to the mouth*, the loose carbon in the box may change its position and impair the articulation."

That the differences in the fineness of the carbon were immaterial, appears from Prof. Barker's answer, 80, 81, pp. 27, 28. The carbon of F^3 was much finer than that of F^1 and F^2, and was mixed with the bronze powder (Ans. 80), and F^3 gave a trifle the better articulation (Ans. 81). *This is in direct confirmation of Mr. Drawbaugh as he testified in 1881–2.* (D. Vol. 2, p. 999, Ans. 1293.)

Prof. Barker further states (Ans. 81) that the tumbler instrument F² seemed to be the easier to adjust and to stay in adjustment better. This was the "one-legged instrument" (Ans. 63), concerning which Mr. Storrow had told the court below, in his argument in September and October, 1884, that such an instrument could not *possibly* operate, and that the defendants had not *dared* to make a test with it in the spring of 1882!

There is no doubt whatever that Judge Wallace was misled into the grossest errors, and even into a deep-seated, however unconscious, prejudice against the Drawbaugh case, by just such unfounded statements of counsel as this.

But why should the court have ignored the performances of the reproduced instruments B, C and I? These instruments were not carbon instruments; *they* had no different conducting material, for they had none at all, but were magneto-telephones; it made no difference how *they* were held—whether at an angle, in the hands, or resting on the table. They demonstrate conclusively that Bell's invention was completely anticipated by Drawbaugh as early as 1870, at least.

Still further reviewing Judge Wallace's first opinion, we will now proceed to point out certain errors of statement found therein, which show the singularly careless manner in which the court examined the evidence, and the ready ear which it lent to every suggestion of complainant's counsel. They may be regarded as trifles, in view of the greater importance of the matters already hereinabove considered: but trifles "show which way the wind blows."

1. William Darr, one of the negative witnesses of ap-

pellees, was examined to show that although he lived near Drawbaugh up to about 1869, he never heard of the talking machine. On cross-examination he broke down and admitted that, at that early time, Drawbaugh spoke to him of talking across the Atlantic ocean, to which the witness replied that he had better try his machine across the Yellow Breeches creek first. The appellants, in reply, called his wife (D. Sur-rebuttal, pp. 109–113), his daughter Maggie (Id. pp. 103–109), his daughter Jennie (Id. pp. 163–170) and his son-in-law, John Brenneman (Id. pp. 114–116), to prove that the Drawbaugh talking machine was perfectly well known in the Darr family, and in the community, at that early date.

The court below speaks of this witness, William Darr, as a "hard-headed old farmer." *He never was a farmer, nor ever pretended to be;* and as for his "hard head," his own family unanimously testified that he was a miserable, drunken sot, wrecked years ago, physically and mentally, by his drinking habit, and from whom the whole family had been obliged to separate and leave him to his ruin. Yet this drunken cabinet-maker is galvanized in the court's opinion into a "*hard-headed old farmer.*"

2. The court below says of Henry Bayler, that he "testifies that he talked through F and B in 1873, but the proofs show that the occasion was between 1875 and 1877."

The proofs show no such thing. They show, on the contrary, that the conversation was just when Mr. Baylor said it was, viz., May or June, 1873. The court's suggestion as to a later date is not based upon the evidence, but upon a false statement in complainants' "Abstract" as to the arrangement of the rooms in the shop in 1873, and as to what Mr. Baylor testified about the running of the talking machine wires.

3. The court below says of H. B. Musser, that he "testifies that he talked through F and B in June, 1874, but the proofs show that this occasion was as late as in the summer of 1876."

Here, again, the court is in error, for the proofs show no such thing. Mr. Musser testifies (D. Vol. 1, pp. 315–323) to *two* visits to Drawbaugh's shop, *both at times fixed by his book entries* relating to the business which took him there, and testifies clearly and explicitly to the occurrences at *both* visits, identifying the instruments which he saw and tested at the first visit, and also those witnessed by him at the second visit. There is nothing which shakes in the least the clear and positive testimony which he gives.

4. The court says that Drawbaugh not only had means of raising money during all the years of his alleged poverty and distress, "but that on many occasions he had means for investment and for speculation." So far as this statement relates to the period extending from the latter part of 1869 to 1880, it is gross error. He did not regard his invention as ready to patent till as late as 1870 or 1871, when instruments C and I were made; and if the court can show that at any time in the year 1870, or the ten years next following, he ever had means for investment or speculation, or ever invested or speculated during those years, to the extent of even one penny, we challenge the production of the evidence. The statement of the court below, on this point, is merely a loose, careless assertion, without one particle of proof to support it, and directly contradicted by all the testimony.

5. The court next states that Drawbaugh "was accustomed to prepare specifications of patents, and advertised himself as an inventor, designer, and solicitor of pat-

ents." Drawbaugh explains that, owing to his knowledge of mechanics, the country inventors in the vicinity occasionally came to him to get him to write out rough descriptions of their inventions *to aid their regular patent solicitors in understanding the ideas or devices of the inventors*, and that, finding he could now and then earn a few dollars in this way, he sought to secure, and did secure, a few jobs of this kind, but that he never acted as solicitor of patents, or attorney, before the patent office, in his own cases or any other. (D. Vol. 2, pp. 863, 864.) The Commissioner of Patents certifies that he never appeared in that office as attorney or associate attorney in any case. (See p. 775, D. *sur-rebuttal.*) A mere glance at Drawbaugh's letters (see, for example, pp. 245–6, D. *sur-rebuttal*) is sufficient to show that he lacked the necessary literary qualifications for the work of a patent solicitor. It is *manifestly* unfair to attach any importance to this trifling matter, which the evidence fully explains.

6. The court next charges that "*during the time he was experimenting on the talking machine*, and before he applied for a patent, he found time and materials for experimenting with and making *the Giffard injector for steam engines*, the *autograph telegraph*, the magneto dial telegraph, the magneto key, the automatic fire alarm, and the electric clock."

The essential statements here are grossly erroneous. He never experimented with a "Giffard Injector," but, *long before he entered upon the talking machine invention*, he devised an injector of his own, altogether different from Giffard's.

He never experimented at all upon any *autograph telegraph*, at *any* time. The automatic fire alarm was a mere thermostat, such as can be made for ten cents by any mechanic, and the fact that he made one has no bearing whatever upon the question of his financial means. The magneto dial telegraph and magneto key were instruments whose cost lay almost entirely in the *labor*, and not in the *materials*, employed in them. The electric clocks which he had prior to about 1876-7 were incomplete, rude and utterly inexpensive. There was but little actual expense to him, outside of the labor of himself and his nephew, George W. Drawbaugh, in any or all of the clocks made before Shettel and the Grissingers took hold of the clock inventions. All these devices, prior to that time, would not have cost for materials, *in the aggregate*, probably twenty dollars; and those materials were supplied at long intervals, little by little, through a period of at least seven or eight years. How manifestly unfair to array these things against him as though they had any importance or value in enabling us to estimate his pecuniary condition!

7. The court next says that "during this period he was a friend of Mr. Weaver, a patent solicitor, who frequently gave him advice and professional assistance, in return for mechanical services rendered by Drawbaugh, and who drew specifications for him for a measuring faucet and for the magnetic clock. If he was not competent himself to make an application for a patent, it cannot be doubted that, with the assistance of Weaver, he could have made a proper application at a trifling outlay, if any, beyond the fees of the office."

To say that this picture is overdrawn is to put the fact altogether too mildly.

Weaver's cross-examination shows him to have been a disreputable shyster, in whose ability or integrity Drawbaugh would have been a fool to confide. *Drawbaugh* did not employ him to draw specifications for the measuring faucet and magnetic clock, but the new faucet company and the clock company, the men who furnished the money for patenting those inventions, employed him for that service. (D. Vol. 2, p. 933, Ans. 992.) His relations with Drawbaugh were not those of a "friend," but only those of a mere acquaintance. Weaver's cross-examination shows convincingly that, on the occasion when he was brought to Drawbaugh's shop in March, 1876, by the axle company, to appraise their property, he attempted to cheat them out of a portion of it, and the proceeding consequently ended in a quarrel and his dismissal. His cross-examination further suggests a very strong suspicion that, when employed as a patent solicitor, he was in the habit of cheating his clients and filing applications for their inventions in his own name. (See C. Vol. 2, pp. 413 to 444.)

It is impossible that Drawbaugh should not have had some doubts or suspicions as to the character of this man, and incredible that he would have resorted to him to aid in patenting so valuable an invention as the telephone, or one so difficult to adequately describe and protect, and which required the best services of an able lawyer. To understand the character of Weaver, the court should read his cross-examination, for no abstract can do justice to it.

8. The court then refers again to the time and expense of Drawbaugh's electric clocks, and the cost of the gear-cutting machine which he devised and made in order to expedite the work, stating that "these clocks were built by him with his own tools, and out of his own money, and to build them economically he made a gear-cutting machine, which must have cost him more than it would to patent his telephone." There is not a par-

ticle of evidence as to the cost or character of this gear-cutting machine. For aught we know, it may have been, and probably was, a simple, inexpensive device. It was copied after one which Shapley lent him, when considering the question of going into the clock business—and the fact that the original machine was the property of a small country jeweler, and was carried back and forth to and from Drawbaugh's shop, shows that it was a small, portable device. Its alleged cost is a mere assumption of the court below.

9. At another point, referring to the testimony of numerous witnesses as to the very words which they heard through Drawbaugh's telephones prior to the date of Bell's invention, the court below says: "When witnesses undertake (as many of them do), to give the exact word or sentence heard in the instrument five or ten years before, when their attention was not called to the subject afterwards, *no hesitation is felt in rejecting such statements as utterly incredible*"!

A convenient way of getting rid of evidence! If no witness had remembered the words which he heard, the court would have said: "No word ever spoken through the instrument is even pretended to be remembered, and this is proof conclusive that none was ever heard;" but when the words *are* remembered, it merely waives aside the statement as "utterly incredible," and serves notice upon us, once for all, *that it will not believe a "myriad" of witnesses who testify in our favor*, although it will accept against us, as gospel truth, any loose statement, any half-remembered or imperfectly understood conversation of years before, any improbable or unjustifiable inference suggested by opposing counsel, any deposition, like that of Matthews, which even the deponent himself afterwards asked the court to disregard by reason of the vagueness and unsatisfactoriness of his memory, even to himself, and will go beyond all these things in order to make out a case against us, and *assume* facts, without evidence, such as that Drawbaugh knew of the article in "*The Manufacturer and Builder*" in 1869, and was, prior to that date, making *electric* experiments with a *non-electric* phonograph!

We do not wish to be understood as charging the court below in this brief with deliberate wrong-doing, but we do mean to be clearly understood as charging it with gross errors of fact and law, and with being manifestly too deeply prejudiced to weigh the evidence fairly, or even read the testimony correctly. When a court expressly refuses to believe a witness testifying to the words which he heard for the first time through a telephone—a startling event, likely to impress his memory—*but receives and accepts the very words of loose, casual conversations of years ago whenever they can be used against Drawbaugh*, it is evident that no known rule of law or evidence guides its deliberations.

One general conclusion is clearly derivable from a careful examination of the opinion of the court below, and it is as follows:

The court evidently started out with the idea of holding that the entire Drawbaugh story was a fraud and a lie, and that Drawbaugh never thought of a telephone till after the publication of Bell's invention.

It soon found itself driven from this position by unanswerable evidence, and was forced to admit that Drawbaugh was indeed experimenting with telephones or phonographs, from 1866, or before, till after 1876.

Compelled to admit that these experiments were *electrical*, the phonograph theory fell to the ground and the telephone alone remained.

The court then fell back upon the theory that the telephones thus proved to have existed years before Bell's invention were incomplete and unsatisfactory, *although the same witnesses whose testimony conclusively proved their existence, proved with equal conclusiveness their complete practical operation and identified the very instruments, which show for themselves that they are completed aud operative machines.*

At this juncture, met by demonstrative evidence which could not be explained away, the court announced that it would not believe a *myriad* of witnesses testifying to their positive and clear recollection of facts within their own knowledge; but would accept as true all kinds of trash—legal evidence or not—which could be found, suggested, or even, when necessary, *assumed*, against Drawbaugh.

The clear, simple and self-evidently honest testimony of Daniel Drawbaugh, however, still remained as an insuperable obstacle to this position. He must, therefore, be disposed of as a witness. Hence, it proceeded to charge him with writing a foolish autobiography, which the conclusive evidence of the original manuscript itself—an exhibit in the case—proved he did not compose. It assumed him to have been a comparatively well-to-do citizen, by mixing up his finsncial status *before* the telephone was in a patentable condition with his financial circumstances for years *after* that event, and by disregarding the unanimous testimony of hundreds of witnesses and misunderstanding and misstating proved facts; and, on these mistaken assumptions, it disposed of his whole deposition. Then, *although it had admitted that the testimony of the* *corroborating witnesses was honest, and was sufficient to overthrow the validity of the Bell patents,* it proceeded to disregard their corroboration *because it had thrown out the evidence of the principal*—Drawbaugh himself.

On the rehearing, although all the tested instruments clearly and emphatically proved their own complete operativeness, it proceeded to make two utterly erroneous assumptions about the reproduced instruments F—both of which assumptions were completely *disproved* by Professor Barker's testimony—and simply *ignored* all the other instruments, B, C and I, *although no such assumption could even be pretended as to them, and although they proved the case as completely as did F.*

It is not too much to say that such an attempt to answer the Drawbaugh case—the best argument that a judicial mind could discover or invent for the purpose—shows to a demonstration *that the Drawbaugh case cannot be answered.*

Calling attention to the three following appendices, marked A, B and C, wherein are discussed the questions of the "ram," the "flood," and the "negative evidence," and to the briefs filed herewith on the Bell patents, we respectfully submit the People's and Overland cases to the judgment of this court.

L. HILL,

Of Counsel for Appellants, The People's Telephone Co. and the Overland Telepone Co.

APPENDIX A.

THE HYDRAULIC RAM CONTROVERSY.

During the progress of this case a number of collateral issues have been raised by complainants and gone into so exhaustively and at such length of testimony, by both sides, as to cause one, in reading over the large portion of the record devoted to their consideration, to wonder whether, in fact, the speaking telephone or something else is the real subject of controversy.

Of these collateral issues none have been spun out at greater length than those raised in respect to the time of the ordering and to the time of the putting in of a certain hydraulic ram, which is admitted by both sides to have been ordered of and furnished by Mr. Drawbaugh for use on the Thomas Draper farm in the borough of Marysville, Perry county, Pennsylvania—nearly seventeen hundred pages of the record being devoted to these issues alone.

The facts and circumstances which gave rise to this ram controversy are both interesting and peculiar. We glean them from the deposition of Thomas Draper (D. Vol. 2, p. 1123.)

It appears that some time in the latter part of January, 1882, a certain person, representing himself to be a lawyer, called upon Mr. Thomas Draper at his home in Dover, Delaware, and requested a few moments' conversation with him concerning his knowledge of the invention of the telephone. That an inquiry should be made on this subject somewhat surprised Mr. Draper, and when he asked the lawyer how he found out that he, Mr. Draper, knew anything about it, he was informed that a man in Marysville had said that he heard Draper mention the fact that he had been to Drawbaugh's shop, at Milltown, and had seen the latter's talking machine. Not knowing the intentions of his questioner, and fearing that he might be called off somewhere as a witness, Mr. Draper was disinclined at first to give any information, but finally, upon being assured that if his evidence were needed his deposition could be taken by commission at his home in Dover, he consented to relate what he knew, as follows:

He said that in the year 1873 or 1874 he and his tenant, George W. Kissinger, who lived on his farm at Marysville, Pa., went over to Mr. Drawbaugh's shop, at Milltown, for the purpose of ordering a hydraulic ram for his farm; that on that occasion he was introduced by Mr. Kissinger to Mr. Drawbaugh and the ram matter was discussed; that Mr. Kissinger asked Mr. Drawbaugh how he was getting along with his talking machine, and the latter replied that he was getting along pretty well, though he lacked means to put it through; that Mr. Kissinger then told Mr. Drawbaugh that he ought to get him, Mr. Draper, to assist him, as he had plenty of money; that thereupon Mr. Drawbaugh took pains to show him, Mr. Draper, his instruments, talked through them to him, spoke of them as the greatest invention of the age, said they would take the place of telegraphy, etc., and intimated to him that he would like to have him go in with him, etc., etc.

This account of Mr. Draper appears not to have been much relished by his interviewer. He asked him if he was sure his visit to Mr. Drawbaugh was prior to 1876, and Mr. Draper replied that he knew it was, and that it was some time in 1873 or 1874. He also questioned him in regard to the kind of instruments he had seen at Mr. Drawbaugh's, got him to describe them as best he could, and remarked that it was a very singular thing that men in different parts of the country should hit upon the same kind of instruments. Mr. Draper told him that he always thought the patent the Bell Telephone Company was operating under was the Drawbaugh patent, and that Mr. Drawbaugh had gotten Bell to go in with him.

The lawyer said that Mr. Draper was mistaken, and then told him that he was an attorney for the Bell Telephone Company, informed him of the present suit, and remarked that Mr. Draper had missed a big fortune, and that he would not be manufacturing phosphate at

Dover if he had taken hold of the talking machine with Mr. Drawbaugh. On leaving, he told Draper that he need not be uneasy about being called as a witness, and that if the other party didn't need him his company certainly should not (D. Vol. 2, pp. 1129-40).

After this interview had taken place, Mr. Draper, feeling that some injustice was, perhaps, being done to Mr. Drawbaugh, sat down and wrote him the following letter, viz. (D. Exhibits 136).

OFFICE OF THOMAS DRAPER & CO.,
Manufacturers of Phosphates and Dealers in all kinds of
Fertilizing Material, Lime, and Grain,
No. 317 S. State Street,
DOVER, Del., Jan. 30th, 1882.

MR. DANIEL DRAWBAUGH.

Dear Sir: I was interrogated to-day by an attorney from New York or Boston in reference to what I know about your having invented a telephone, or talking machine, as you called it when you first showed it to me. When he first began to talk I thought he was a man you had sent down here, but I soon found my talk did not suit him, and when I tried to find out where he was from and what he wanted, he told me he was a lawyer from the opposite side from you, and that there was a big law suit pending over the telephone patent between you and the Bell Company. I told him I did (not) [D. Vol. 2, p. 1131, Q. 40] want to be called up as a witness, but I thought you ought to have the benefit of your invention. He asked me when I first saw yours. I told him I had never seen it but once, and I thought that was in 1873 or 1874, and that you showed me what you could do with it, and that you talked to me with it in an adjoining room, and that you said your only trouble was money to carry out your plan, and that you wanted me to take hold with you or let you have some money to carry out your plans. If you recollect, George W. Kissinger was with me at your place. He and I had a long talk about it afterwards. Now, I do not want to be taken from home, as I am getting old, but I do not like to see a man cheated out of his just rights.

Are you going on with your suit?

Ever Truly,
THOMAS DRAPER.

This letter conveyed to defendants the first intimation that such a man as Mr. Draper was in existence. The complainants, it appears, had found him out before from the man in Marysville, but this was the first the defendants had heard of him.

Just as soon as practicable after the receipt of the letter by Mr. Drawbaugh, Mr. Draper was put upon the stand by defendants, and gave a clear, powerful and convincing deposition, unsurpassed by any other in the whole case.

In it he explains the object of his visit to Drawbaugh's shop, describes with accuracy some of the talking machines which Mr. Drawbaugh showed him and talked through to him at that time, identifies such instruments (C reproduced and I) when they are again shown him, tells how Mr. Drawbaugh tried to interest him and induce him to lend the much-needed financial assistance to push the invention, and gives a very full account of the interview with the complainants' agent before being called to testify, and of his subsequent communication to Mr. Drawbaugh about that interview.

Concerning the object of his visit to Drawbaugh's, he says that Mr. Kissinger leased his farm and moved on it in the spring of 1874, and very shortly afterwards began to make complaint of the great distance his wife had to carry the water, and urged him to put in a ram to force the water from the spring up to the house; that it was in consequence of the urging of Kissinger that in the summer of 1874 he was induced to go with the latter to Drawbaugh to see about the ram.

There can be no doubt about when Mr. Kissinger leased the farm, as the original lease is in evidence, and is dated April 1, 1874 (D. Vol. 2, 1124).

Never has Mr. Draper varied from his original testimony about the date of the ordering of the ram and of his visit to Mr. Drawbaugh. When recalled by defendants he gives another reason for knowing it was ordered in 1874.

He says that at the particular visit to Marysville, during which the trip to Drawbaugh's was made, he went up into the woods with Mr. Kissinger and looked at some crooked white-oaks that were there, and remembers distinctly telling Mr. Kissinger that he wished he had those timbers at his home in Delaware to use in the construction of a vessel he was about to build (D. S. rej. 174).

This occurrence could not possibly have happened later than 1874, for it is conclusively proven by a book entry that the work of getting out the timbers which were actually used in the construction of that vessel was commenced on the 4th day of November, 1874 (Ibid, 171).

After giving his first deposition, Mr. Draper, it appears, was repeatedly visited by Mr. Comfort and others of complainants' agents, and interrogated about this visit to Drawbaugh's; yet all their powers of persuasion seem to have been unable to shake him in the slightest in regard to the time of that visit, for in a letter which he wrote to Mr. Storrow, complainants's counsel, May 1st, 1884, after complainants had had him and his wife and daughter up to Philadelphia (D. S. rej. 253), he says: "As I told you "when I was at your place, you are all alike to me; I "don't know who is entitled to a judgment, nor do I care, "so it goes right. This much I do know,—that I was "at Drawbaugh's in 1874, and saw his instruments."

In view of the fact that Mr. Draper testified to going over to Milltown with Mr. Kissinger in a spring wagon, Mr. Kissinger was called in to prove that the trip was made in a particular spring wagon, which he did not *buy* from Mr. Peter Kaffenberger till the fall of 1876 (Kissinger, C. Vol. 3, 2411, Q. 70). Though no confidence can be placed in Mr. Kissinger's memory about so inconspicuous a matter as the particular kind of a wagon he used for taking a drive in on any particular occasion ten years ago, the whole effort of the complainants was rendered entirely abortive by Mr. Kaffenberger's admission that he owned the particular wagon in question from the spring of 1874 till he sold it to Mr. Kissinger in the fall of 1876 (C. Fol. 3, 2476, Q. 4), and that Mr. Kissinger was quite in the habit of borrowing wagons from him (Ibid, X. Q. 18). So, even if Mr. Kissinger was right about the particular wagon he took Mr. Draper over to Milltown in, the chances are that he borrowed it from Mr. Kaffenberger for the purpose. In fact, his reputation as a borrower is well established. (Kaffenberger, C. Vol. 3, 2476; Harper, D. S. reb. 658; John H. Cowen, Ibid, 724-5; Champion, Ibid, 597; Shaffer, Ibid, 872.)

The testimony of Mrs. Anna E. Draper, wife of Thomas Draper, materially strengthens that of her husband, and negatives the complainants' theory.

She testifies that it was the habit of her husband to visit the farm at Marysville about once a year while Mr. Kissinger lived upon it (C. Vol. 3, p. 1883). Also that she accompanied her husband on the trip which he made to the farm in the fall of 1877, and that on no other occasion went either to the farm or to Marysville while Mr. Kissinger lived on the farm (Ibid, p. 1882).

Now, the complainants' theory is that the trip of Mr. Draper and Mr. Kissinger to Milltown to see Mr. Drawbaugh was made during this visit of Mr. Draper and his wife to the farm in 1877. It is significant, however, that Mrs. Draper does not remember anything about her husband going to Milltown on that occasion (D. S. rej. 207), nor of hearing, at that time, anything about Mr. Drawbaugh or his talking machine (Ibid, 209; Q. 9, 10), but her recollection is distinct that while she was at home on the farm at Magnolia, Delaware, Mr. Draper, after one of his Marysville trips, told her about meeting Mr. Drawbaugh and seeing his talking machine, and about Mr. Drawbaugh's wanting him to invest money in his said invention, and of her advising him not to go in with Mr. Drawbaugh, as he had business enough already without it.

If Mr. Draper had, as complainants contend, gone to Milltown while she was up to Marysville with him in 1877, it is more than likely he would have told her at Marysville, on his return from Drawbaugh's shop, of the remarkable things he had seen at Drawbaugh's shop, and of Drawbaugh's desire that he should invest, and these things she would have remembered; but she remembers nothing about any such occurrence at Marysville. On the contrary, she has distinct recollection that her first knowledge on the subject of Mr. Drawbaugh and of his talking machine was imparted at her home at Magnolia.

Mr. Draper's eldest son, Thomas B. Draper, also corroborates his father, and from his peculiar situation his testimony is entitled to the greatest weight.

He says that when Mr. Kissinger came down to Dover to see his father, during the Centennial Exposition of 1876, he heard his father and Mr. Kissinger discussing the ram (D. S. rej. 206, Q. 3), and that before that time he heard his father at home, on the farm at Magnolia, in the presence of his mother, brothers and sisters, speak of having visited Mr. Drawbaugh's shop to order a ram, and of having at that time seen a talking-machine there. (Ibid. Q. 5, 6.)

Now there is not the remotest probability of this witness being mistaken. He was never at Marysville from the time he moved away from there to Delaware with his father in the year 1867 (Ibid. 207, Q. 10), and he never saw Mr. Kissinger after so moving away, except on the occasion of this visit of the latter in 1876 (Ibid. Q. 9).

He cannot be in error about the time of Mr. Kissinger's visit to his father's, as Mr. Kissinger himself testifies he went down from the Centennial Exposition in 1876, and was never there on any other occasion (C. Vol. 1, X. Q. 139, 140), and Mrs. Draper, when called by complainants, testifies to the same effect (C. Vol. 3, p. 1882, Q. 14). The conversation, then, which the witness heard between his father and Mr. Kissinger about the ram must have occurred in 1876, as it could not, by any possibility, have occurred at any other time; and the fact that the witness remembers hearing his father tell about going to Drawbaugh's to order the ram and seeing the talking machine long before Mr. Kissinger came down to Magnolia, and, as the witness says, prior to the building of the "Anna E. Draper" in 1875 (D. S. rej. 206, Q. 6), the conclusion is irrestible that his father's testimony about the ordering of the ram in 1874 is correct.

As against this clear and positive testimony of Mr. Draper, and the strong corroboration of his wife and son, the complainants offer the testimony of four witnesses on the subject of the *ordering* of the ram, viz.: George W. Kissinger, his son, George Franklin Kissinger, and his son-in-law, James C. Zimmerman, and Herman J. Eppler.

The testimony of tne son and son-in-law is loose, vague, indefinite, and unsatisfactory, and that of Eppler unreliable. George W. Kissinger's we will consider further on at length.

All that the son, George Franklin, has to say is, that his father and Mr. Draper went over to Drawbaugh's the fall before the ram was put in, "if I am right." He does not pretend to have seen them go, nor to have seen them come back, nor to have been told they were going there. He simply says in answer to the question: "How many "seasons before the ram was put in was it that they "went over there about it? It was the fall before, if I "am right" (C. Vol. 1, 583, Q. 9). No weight can be given testimony so vague and indefinite in character as this. More than this, he was asked in cross-examination how he fixed the time, and he replied that he and the other members of the family had been talking about the matter, and had agreed upon the date (C. Vol. 1, 586, Q. 42).

The most that the son-in-law, Zimmerman, can say on the subject is that his father-in-law *told* him in the fall of 1877, while Mr. Draper was there on the farm, that he had been over to Drawbaugh's to see about the ram (C. Vol. 1, 631). If he testifies truly to the fact that Kissinger made the declaration about having been to Drawbaugh's to order the ram he has probably mistaken the date, and it was in 1874, as Draper testifies. During the last-named year he lived in Perry County (Ibid. 624, Q. 25), and it is probable he was frequently at Mr. Kissinger's house, as his wife was the latter's daughter. Kissinger may then have made the remark to him.

His memory of facts and occurrences is not good, and his ability to go wrong about Draper's visits, and mistake one for another, is shown by the circumstance that while he testified he was living in Mr. Kissinger's house from January, 1876, to the spring of 1880 (Ibid. 627, Q. 50–54), he cannot remember of Mr. Draper visiting the farm prior to the fall of 1877 (661, X Q. 416), though the latter is shown to have been there also in February of 1877 (Draper D. S. rej. 176, Q. 42), (Kissinger C. Vol. 3, p. 2421, X. Q. 156), and he swears most positively that Mrs. Draper was never up to the farm with her husband (C. Vol. 1, 650, X. Q. 291), though it is proven beyond question that at the very time he swears Kissinger told him he had ordered the ram, Mrs. Draper was living there in the same house with him, and had been for about a week (Mrs. Draper, C. Vol. 3, 1882, Q. 11), (Draper D. S. rej. 183, X. Q. 57). So, too, he said, "it ran in his mind" that Mr. Kissinger brought Mr. Drawbaugh and the ram from Milltown on the 4th of November, 1878 (C. Vol. 1, 650, X. Q. 292), but Mr. Kissinger swears positively he didn't bring the ram at all (C. Vol. 3, p. 2408, Q. 42), and Cyrus Kissinger, that the ram was brought a week before Mr. Drawbaugh came and some time before Mr. Zimmerman's date (C. Vol. 2, 1471, Q. 81). Nor does his character seem better than his memory, for he admits that he seduced his wife, and was brought in and forced to marry her by a law officer four days after her first child was born (C. Vol. 1, 624, X. Q. 118–130), and he also admits so have frequently been in company with complainants' agent and detective, Mr. John C. Comfort, which is, perhaps, even worse.

The deposition of Herman J. Eppler is so filled with contradictions, inconsistencies, and evasions, and his bias in favor of complainants is so apparent and ever present, that the true value of his testimony can hardly be appreciated, except from a perusal of his whole deposition from beginning to end.

It is a significant fact that, though called to Philadelphia by complainants, according to his own admission, in February or March, 1883, while complainants were taking their testimony in reply (C. Vol. 3, 2187, X. Q. 70), and while they were putting in testimony on the subject of this ram, he was not examined at that time, and in fact not put upon the stand until after defendants had put in their sur-rebutting evidence, and when the complainants were just about closing their evidence in sur-rejoinder—more than a year afterward.

During this long interval of time Mr. Eppler seems to have been frequently in consultation with complainants' agents and witnesses, and upon reading his testimony one is strikingly impressed with the apparent effort to make it fill out and substantiate complainants' theory.

He testifies that he was the agent in charge of Mr. Draper's Marysville property from the spring of 1877 till the latter part of January, 1882; and that for a month or two before the papers appointing him agent were made out, there was a verbal agreement between him and Draper concerning this agency; that Draper visited Marysville in the spring of 1877, and again with his wife in the fall of 1877; that on the occasion of Draper's visit in the fall of 1877, Mr. Draper and Mr. Kissinger stopped at his shoe store in Marysville, and said they were going over to Milltown to order a ram for forcing water up to the house on the farm; and that on the evening of the same day, after their return from Milltown, Draper and Kissinger came again to his shop, and told him that they had ordered the ram, and that it was to be put in soon (C. Vol. 3, 2184, Q. 44; 2263, X Q. 621).

Were this witness a truthful and reliable person, it would be difficult to reconcile his statements about the ordering of the ram with defendants' theory, but inasmuch as his testimony shows him to be a person upon whose statements no dependence can be placed, the conclusion is inevitable that his story is a complete fabrication and unworthy of credit.

Knowing the witness to have been the agent of Mr. Draper at a period important in the history of this Kissinger ram, Mr. Hill, as counsel for defendants, visited Mr. Eppler at his place of business at Baltimore in June, 1883, for the purpose of seeing what light the latter might be able to throw upon the ram controversy; and learning from him that Mr. Storrow, complainant's counsel, and their agent, Mr. Comfort, had been there previously, and had been given a number of letters and papers bearing upon his agency, got the witness to give him an order upon Mr. Storrow for permission to examine said letters and papers, but, fearing that Mr. Storrow would not show him the papers, also took the written statements of the witness as to what they contained for use as a basis for a possible motion to compel the production of the papers for inspection.

The written order on Mr. Storrow, and the written statements of the witness, all signed by him, are as follows:

Baltimore, Md., June 27, 1883.

J. J. Storrow, Esq.,
40 State St., Boston, Mass.

Dear Sir,—Please permit Lysander Hill, Esq., to see and take copies of all the papers and the books which you and Mr. J. C. Comfort obtained from me during the past six months. H. J. Eppler.

BALTIMORE, June 27, 1883.

"In the written agreement between Thomas Draper and George W. Kissinger, dated not later than April 1st, 1877, as I remember it, there was a clause to the effect that said Kissinger was to keep the ram in repair. The said paper is now in custody of J. J. Storrow, Esq."

H. J. EPPLER.

BALTIMORE, MD., June 27, 1883.

I let J. J. Storrow and J. C. Comfort, several months ago, have eight letters, a written agreement, and an account book. The letters were from Thomas Draper to me. The agreement was between Draper and George W. Kissinger. The account book contains accounts between me and Draper, relating to my having charge of his farm during a portion of Kissinger's tenancy. For the use of these papers said Storrow and Comfort paid me $25, of which $5 was paid me for one letter. The agreement was dated, I think, either in January or April, 1877, and contained a reference to a hydraulic ram. One of the letters referred to said ram, and the other letters may have contained references to said ram, but I do not remember whether they did or not. I think the letter referring to the ram was dated some time in 1877.

H. J. EPPLER.

When cross-examined, he is questioned in regard to this interview with Mr. Hill, and, as we shall see, gives an entirely different and contradictory account of things from that contained in his written statements above quoted. He is asked (X. Q. 308) if he told Mr. Hill how many or what papers Mr. Comfort or Mr. Storrow had obtained from him, and he replied he had no recollection of doing so. His written statement, however, shows that he informed Mr. Hill that he "let J. J. Storrow and J. C. Comfort, several months ago, have eight letters, a written agreement and an account book."

He is asked (X. Q. 412) if he told Mr. Hill anything about the date of the contract between Mr. Kissenger and Mr. Draper, or about the contents of that contract, and he replies, "I don't recollect that I did." His statement to Mr. Hill, however, shows that he *did*.

He is asked (X. Q. 413) if he didn't tell Mr. Hill that the contract was not dated later than April 1, 1877, and that it contained a clause to the effect that Kissinger was to keep the ram in repair, and he swears that he did not make any such statement to Mr. Hill; and further, that he never had the impression on his mind that that agreement was not dated later than April, 1877 (X. Q. 418), nor that it was dated Jan. 1877 (X. Q. 420), nor that there was a clause in that agreement that Mr. Kissinger was to keep the ram in repair (X. Q. 416), but his written statement given to Mr. Hill contradicts all of this.

He is asked if his recollection always was that he first heard or knew of the intention of Mr. Draper and Mr. Kissinger to put a ram in in Nov., 1877 (X. Q. 537), and he replies that that was always his clear and positive recollection, but his written statement shows that his recollection, at the time Mr. Hill came to see him, was that it was as early as April 1, 1877, when a contract between Kissinger and Draper was entered into for keeping the ram in repair. He is asked if he did not make such contradictory statement to Mr. Hill, and he denies it (X. Q. 439).

He is asked (X Q. 444) if he always had a clear recollection that the visit of Draper and wife occurred in the fall of 1877, and that his first knowledge of the intention to put in a ram was obtained during that visit of Draper and his wife, and he answers he had; but the statement given by him to Mr. Hill shows quite the contrary.

He is further asked if it has always been his memory, from the time he gave the lease or agreement to Mr. Storrow or Mr. Comfort, that said lease or agreement was dated in the latter part of 1877, and he replies that such has been his memory not only from the time mentioned but also ever since he first got the lease (X. Q. 489); but here again he is contradicted squarely by the paper given to Mr. Hill a year previous, which shows that his statement was—we know not about his memory—that said agreement was dated either January or April, 1877.

He is further asked, specifically, if he did not tell Mr. Hill that the agreement was dated not later than April 1, 1877 (X. Q. 509), and he answers that he did not, though his answer is contradicted *in terms* by his written statement.

He further says that he knew perfectly well, at the time Mr. Hill came to see him, that the agreement was dated in December, 1877 (X. Q. 513), which is a pointed admission of his inability to tell the truth, in view of the flat contradiction of the written statement.

He is asked whether it was his memory at the time Mr. Hill came to see him that there was a clause, either in the lease or in the agreement, to the effect that Kissinger was to keep the ram in repair (X. Q. 514), and he replies that was not his memory, and that there was nothing said about the agreements mentioning the ram. But one of his written statements says that the agreement contained a reference to a hydraulic ram, and the other a clause to the effect that Kissinger was to keep the ram in repair.

He further testifies that he did not tell Mr. Hill there was anything in the agreement about the ram, but did tell him there was a reference to the ram in one of the letters which Mr. Storrow took (X. Q. 519). But upon referring to his written statement No. 2, made to Mr. Hill, we find that in it he says that besides the reference to a hydraulic ram in the agreement, there was also a reference to said ram in at least one, or perhaps more, of the letters, thus showing conclusively that the agreement and letters were separately considered by him when he made such statement.

He is further asked if he did not state to Mr. Hill either that the agreement or the letter contained a clause to the effect that the ram was to be kept in repair, and he replies that nothing was said about the word *repair*, but only that the letter mentioned the ram, wherein, again, he is positively contradicted by his written statements.

The above are some of the many instances found in his deposition wherein his testimony given for complainants is directly contradicted by his written statement made to defendants' counsel a year previous to his examination. And it should be noted that all these contradictions were drawn from him on examination, before the written statements were produced and shown him, which demonstrates either that he deliberately lied to Mr. Hill when the latter took his statements down, and forgot about making the statements, or that he is a person of no memory and in the habit of making reckless statements about matters in regard to which he knows nothing, his testimony being worthless in either view.

Upon the production of the papers, he is forced to admit the genuineness of his signature, that being a matter easily proved by extrinsic evidence, but denies that he ever made any such statements as are embodied in them, admitting only that they were read to him, and that he looked at them and signed them.

After casting this reflection upon counsel for defendants, who prepared the papers under his direction, he proceeds to justify and excuse any misstatements that may have been contained in the papers on the ground that at the time they were written he was worried and worn out from loss of rest in attending his wife, who then and for eighteen months previously had been sick. But when it is borne in mind that at the time these statements were made he was at his shoe store in Baltimore attending to his ordinary duties there; and that but a short time previous, and while, as he alleges, his wife was still sick, he received several visits from complainants' counsel, Mr. Storrow, and complainants' agent, Mr. Comfort, and he made several trips to Harrisburg and Philadelphia with these gentlemen—about all which he pretends to have a clear recollection—his alleged attention to his wife, and the worry consequent thereupon, does not strike one as being a very reasonable or satisfactory excuse.

Moreover, while he is unable to testify truly to what he told Mr. Hill, and to what the latter put down upon paper under his direction, he is able to testify quite circumstantially about the other unimportant paper which he signed and gave Mr. Hill on the same day, viz.: the order upon Mr. Storrow for the papers and book.

The inability of the witness to give two similar accounts of the same event crops out all through his deposition. For instance, in giving an account of his trip from Baltimore to Marysville, to hunt papers for complainants, he says in X. Q. 135 that he went up in the morning from Baltimore and came back the same evening; while in answer to X. Q. 137 he says in regard to the same trip that he left Baltimore on the *night* train, but could not tell what time he left, though he knows it *was late at night*. So, too, in regard to the money that Mr. Storrow and Mr. Comfort paid him for the papers he gave them. He testifies (X. Q. 198), when cross-examined by Mr. Jacobs, that he never received, either from Mr. Storrow or Mr. Comfort, any money for any papers, or for the use of any papers, but in another part of his deposition, while being cross-examined by Mr. Hill, he swears that Mr. Comfort, between Mr. Hill's two visits, paid him $20 for the *use of* papers (X. Q. 312); and again, that Mr. Comfort gave him $20, not as security, but *for the use of* papers (X. Q. 316), and the written statement (No. 2) which he gave Mr. Hill again catches him by reciting that, "for the use of these papers said Storrow and Comfort paid me $25, of which $5 was paid me for one letter."

On the same subject he testifies (X. Q. 190) that when Mr. Comfort gave him the $5 for the letter of December 18, 1877, he told him it was as security until he returned the letter, and, in another place, that the $25 paid him was for the use of the papers till the complainants were through with them, after which they would be returned to him (X. Q. 315), plainly indicating that the ownership in the papers had not passed from him; but the receipt signed by him, which the complainants have put in evidence (C. Vol. 3, 2286), shows that there was an absolute sale of the letters and papers by him, and that they were to be used in this suit, if needed, and afterwards *to be the property of complainants.*

The unreliability of the man is shown in another instance. He testifies (X. Q. 157) that the *six or seven letters* which he gave Mr. Comfort, or Mr. Storrow, at Marysville, and the letter of December 18, 1877, which he afterwards gave to them, are the only letters or papers of any kind that he ever gave to Mr. Comfort or Mr. Storrow, or any one acting for complainants; but he afterwards contradicts himself by stating that at the second visit Comfort made at Baltimore he gave the Kissenger-Draper agreement to him (X. Q. 567); and he is further contradicted by the admission of complainants' counsel (C. Vol. 3, 2287) that he had given them *nineteen letters*, besides the Draper-Eppler power of attorney of March 8, 1877, and the Draper-Kissinger agreement of December 4, 1877.

Another contradiction of himself is found in his testimony relative to the time when he gave Comfort the letter of December 18, 1877. He says (X. Q. 148) that Comfort got that letter in August or September, 1883, some time after his wife died, and that she died some time in July, 1883; but in another place he swears with equal positiveness that he put that letter in Mr. Comfort's hands and received $5 for it a couple of months *prior* to Mr. Hill's visit to him (X. Q. 336), and his written statement No. 2, signed by him June 27, 1883, and given to Mr. Hill, on that date, is to the same effect.

In fine, the whole of his testimony shows him to be utterly unreliable, and a person who recklessly or intentionally makes a different statement upon a given subject every time he is interrogated about it.

The amount of influence which the complainants have brought to bear upon him can only be conjectured from the extent of his association with their agents and the amount of money he admits having received from them at different times.

He admits that Mr. Comfort came to see him at Baltimore early in 1883, and asked him to go to Harrisburg and Marysville to look up some papers; that afterwards Mr. Storrow and Mr. Comfort came to see him at Baltimore and arranged for a meeting in Harrisburg; that he went to Harrisburg and thence to Marysville with them and thence back, alone to Baltimore; that subsequently he again met Mr. Comfort and Mr. Storrow in Harrisburg in response to a telegram, and went from there to Milltown with Mr. Storrow and thence back to Harrisburg; that after that he accompanied Mr. Storrow to Philadelphia, where the complainants were taking their testimony, and there had a consultation with complainants' counsel, Messrs. Storrow and Smith; that Mr. Comfort came to see him again at Baltimore; that after that he went to Philadelphia again and staid two or three days and there met Mr. Brooks, another of complainants' agents, and that he again met Mr. Brooks at Marysville afterward and also had a talk with Mr. Zimmerman, Mr. Kissinger's son-in-law. Besides all these consultations with complainants' counsel and agents he appears to have been at Philadelphia for a considerable period prior to the giving of his deposition, and even after his deposition was taken, he appears to have been at Harrisburg in consultation with the complainants while they were taking their closing testimony. (See Kissinger, C. Vol. 3, 2419, X. Q. 139.)

How much money he has actually received will probably never be known.

He admits the payment to him of $5 by Mr. Comfort at Baltimore for the letter of Dec. 18, 1877; another payment of $15 by Messrs. Storrow and Comfort, at Harrisburg (X. Q. 212); another payment of $25 by Mr. Comfort at Baltimore, of which $20 was for the use of papers and $5 for between one and two hours' time talking to Mr. Comfort (X. Q. 321); another payment of $25 made him by Mr. Comfort at Philadelphia two or three weeks prior to his examination (X. Q. 328); another payment of $15 by Mr. Storrow at the time last mentioned (X. Q. 330); another payment of $5 by Mr. Comfort and another of $5 by Mr. Storrow (X. Q. 331).—the last five dollars received from Mr. Comfort witness having asked for.

These payments were not intended to cover expenses, as the witness says complainants' agents always looked out for his expenses separately, and entertained him in first-class style at the "Hotel Lafayette" whenever he was at Philadelphia (X. Q. 348).

As against the clear and positive testimony of Mr. Draper, the testimony of such a biased, unreliable and untruthful witness as this certainly cannot stand. Complainants will no doubt make a great point of the fact that witness was the agent of Mr. Draper and hence in a position to be informed about the ram matter, but he himself testifies that he had nothing whatever to do with the procuring or putting in of the ram, and that it was a matter that lay entirely between Mr. Draper and Mr. Kissinger (C. Vol. 3, p. 2263, X. Q. 620).

The only remaining witness relied upon by complainants to prove the date of the ordering of the ram is Mr. George W. Kissinger, the person who accompanied Mr. Draper to Mr. Drawbaugh's shop when the ram was ordered.

In entering upon a discussion of Mr. Kissinger's evidence, we feel our entire incompetency to do the subject justice.

The ignorance, stupidity, lack of memory, and confessed untruthfulness of the man can only be fully appreciated from reading his two remarkable depositions from beginning to end.

Nothing could be more abortive than the attempts made in his first deposition to fix the dates of Draper's visits to the farm, and the date of the trip which he and Draper made together to Drawbaugh's shop.

He says, in one place (C. Vol. 1, 564, X. Q. 132), that Draper's first visit to the farm was near on to two years after he (Kissinger) moved on to the farm, which would bring it some time in 1876. In another place (571, X. Q. 200), that this first visit was in the spring or early fall of the year after he moved on the farm, which would bring it in the spring or fall of 1875. As to the second visit of Draper, he says, in one part of his deposition, that he thinks that it was about eighteen months after he moved on to the farm (570, X. Q. 200), which would bring it in the fall of 1875, while in another part he swears that this second visit was in the fall of 1877 (570, X. Q. 191). He says that Mr. Draper's third visit was in the fall of 1878 (570, X. Q. 193).

Now, as a matter of fact, we know from the testimony of Draper that his first visit to the farm was in the summer or fall of 1874, and prior to Nov. 4, 1874 (Draper, D. S. rej. 171 and 174, and 33), and not in '76, nor in the winter or fall of '75, as Kissinger testifies; that his second visit was in April, 1875 (Draper, D. S. rej. 175; Exhibit Kissinger, Draper Letter, May 30, 1875, D. Exb. 138, D. S. rej. 169; Kissinger admission, 2d Dep., C. Vol. 3, 2045), and not in the fall of '75, nor in the fall of '77, as Kissinger testifies; that Draper didn't visit the farm at all in 1876, and that he made his third visit in Feb., '77 (Draper, D. S. rej. 176), and not in the fall of '78, as Kissinger testifies.

In regard to the trip to Drawbaugh's, Kissinger, in his first deposition, testifies that it was on the occasion of Draper's second visit to the farm that they went over there (571, X. Q. 202), which would bring it, according to his other testimony given in the same deposition, either in the fall of 1875 or in the fall of 1877, and according to the fact in regard to the second visit, in April, 1875; but he seems to have even been unable to positively settle upon either of these dates, for in a letter which he wrote to Mr. Jacobs, one of defendant's counsel, in 1883 (C. Vol. 3. 2423), after he had given his testimony and after he had had full opportunity to calmly consider the matter, he volunteers the statement that he thinks it was in Feb., '77, when he and Draper went over to Drawbaugh's shop to order the ram.

Concerning the letter which he wrote to Mr. Jacobs, he commits the vilest and most barefaced perjury, and admits it, too. He is asked, while on the stand the second time, whether since he gave his first deposition he had always felt entirely certain that the trip to Drawbaugh's shop with Mr. Draper was made in the fall of 1877, and he replies that he has (C. Vol. 3. 2420, X. Q. 148). He is then asked if he did not, in Feb., 1883, inform Mr. Jacobs that he thought that that trip to Drawbaugh's shop was made in February, 1877; and he replies, positively, that he did not so inform Mr. Jacobs (Ibid. 2423, X. Q. 168).

The letter is then shown him, and, finding himself cornered, he gets up and makes a most excited and incoherent speech, protesting his friendship for Mr. Drawbaugh, but denouncing the defendants in the most abusive terms, and charging them with the gravest offenses (Ibid. 2425); but when he gets all through and quiets down he is put the following question, framed so as as to give him an opportunity of creeping out of his difficulty on the plea of forgetfulness, viz.:

"X. Q. 176. And then you forgot all about the letter, and forgot that you had ever thought that the time of the visit which you and Draper made to Drawbaugh's shop was in February, 1877, did you not?"

Yet not availing himself of the chance offered him, he confesses to barefaced perjury by the reply:—

"I never forgot the letter: I knew that letter would come up." After which he jumps up, and says he is "going home," and refuses to give any further explanation of his testimony.

At a subsequent day he is made to retract one by one the charges he had made against the defendants, and to admit there was no truth in them (C. Vol. 3, 2442, X. Q. 277 to X. Q. 291).

This is the character of the man chiefly relied upon by the complainants to rebut Mr. Draper. Will the court place any reliance upon his statements after such an exposition? We think not.

But we are not yet through with his testimony about Draper's visits. He says in his first deposition (574, Re-X. Q. 229) that the ram was first put in in '78, and that the first fall after the ram was put in Draper and his wife came up to the farm.

This would make Draper's visit, with his wife, in the fall of '79, but Draper (D. S. rej. 183, X. Q. 57) and Mrs. Draper, when called for the complainants (C. Vol. 3, 1881), prove conclusively that they were up there together in November, 1877, and at no other time, which, according to complainants' theory, makes that visit a year *before* the ram was put in, and not a year *after*, as Kissinger testifies. Again, in his first deposition (574, X. Q. 229), he testifies that the fall after Draper and his wife were up at the farm, Draper and his daughter came up. This would make the visit of Draper and his daughter in 1880, and two years after the ram was put in. But Draper (D. S. rej. 183, X. Q. 57) and his daughter, Virginia M. E. Draper, when called by complainants (C. Vol. 3, 1886), prove beyond question that their visit to the farm together was made in November, 1878, instead of in 1880, as Kissinger testifies, the date of their visit being positively fixed by a letter received by Miss Draper while she was there, and which is in evidence (C. Vol. 3, 1887).

Reviewing these attempts of Kissinger to fix the dates of Draper's visits, and his efforts to associate events and occurrences with those visits, we find that in not a single instance has he even guessed correctly. What value can such testimony have if even honestly given, and how can it stand in view of the clear, positive, and corroborated evidence of Mr. Draper? We affirm that a satisfactory decision of this whole ram controversy can be made upon the testimony of the few witnesses we have considered.

There are scores of others on both sides who testify to the putting in of the ram and the preparations made for it, and to other remote matters admitted to have happened subsequent to the ordering of the ram, but those we have treated are the only ones who speak to the vital point, *i. e.*, the date of the ordering of the ram.

Should the court, however, conclude to go further, we are prepared to show that the great preponderance of evidence on even the remoter points goes to confirm Mr. Draper in his date, and to refute completely the theory of the complainants.

Before entering upon a further discussion of the evidence it will perhaps be well to inform the court of the facts which are not controverted in regard to the ordering and putting in of the ram, and also to indicate the theory of the defendants, and what we conceive to be the theory of the complainants in respect to those matters.

FACTS NOT CONTROVERTED.

It is amply proven and substantially admitted on both sides that the Draper farm which figures in this controversy is located within the limits of the borough of Marysville, Perry county, Pennsylvania, and just back of the village of Marysville, on what is called the "Valley Road," a road leading from the Susquehanna River through the village of Marysville, and up the Fishing Creek Valley; that from the 1st of April, 1874, to March 1880, Mr. George Kissinger lived on that farm as the tenant of Mr. Draper; that at a time, about which there is controversy, Mr. Draper, accompanied by Mr. Kissinger, went over to Milltown and ordered of Mr. Drawbaugh a hydraulic ram, to be placed on the Draper farm; that preparatory to the putting in of the ram, timber was cut and bored on the Draper farm for use as piping between the spring and the ram; that iron piping was also procured to convey the water from the ram up to the house; that trenches were dug to receive the piping; and that, finally, the ram was brought to the farm, set up, and put into operation.

It is also admitted that there never was a ram on the

Draper farm prior to the ordering of the one by Draper and Kissinger of Drawbaugh, and, further, that no ram was ever procured for the Draper farm except from Mr. Drawbaugh.

THE DEFENDANTS' THEORY.

The defendants' theory is that the ram was ordered in the summer or fall of 1874; that the timber for the wooden piping was cut, bored and laid in the years 1875 and 1876, commencing in the winter and spring of 1875; that old metal pipes, for use between the ram and the house, were procured some time between the spring of 1875 and September, 1876; that the ram was brought over from Mr. Drawbaugh's between harvest and corn-cutting time in 1876; that it was put in by Mr. Drawbaugh in the fall of 1876, and not later than September of that year; that it remained in till the fall of 1878, giving very little satisfaction, sometimes working and sometimes not, when it was sent to Mr. Drawbaugh's shop to be cleaned and repaired, after which it was brought back and put in again, in connection with new iron pipes, procured as substitutes for the old rusted and leaky iron pipes first put in, Mr. Drawbaugh superintending the job.

THE COMPLAINANTS' THEORY.

The complainants, on the other hand, contend that the ram was not ordered till the fall of 1877; that the timber for the wooden piping was not cut and bored till the winter of 1877–78 and spring of 1878; that no metal piping was procured till July, 1878, and that the ram was not brought over from Mr. Drawbaugh's shop and put in by the latter till early in November, 1878.

THE EVIDENCE IN SUPPORT OF DEFENDANTS' THEORY.

We will first consider the evidence offered in support of defendants' theory. But before going into that, the attention of the court is directed to the photographs, marked "Defendants' Exhibits Photographs of Kissinger Place, Nos. 1 to 6 inclusive," of which profert was made at page 246, Defts.' Sur-rej., and also to the plan marked "Complainants' Exhibit Ives Survey Draper Farm," printed on page 2450 of Vol. 3, Complainants' Testimony. These are referred to at this point in order that the court may become somewhat familiarized with the Draper farm and its surroundings. and be able to, with more facility, understand the testimony.

Photograph No. 1 is a view looking toward the west, and taken from the edge of the field lying immediately east of the Kissinger house toward the village of Marysville. The fence at the extreme left of the picture runs parallel to and borders the "Valley Road." To the right, and some distance back from the road, stands the stone house formerly occupied by Mr. Kissinger, Mr. Draper's tenant. The house, it will be observed, is located very near the top of a hill, and between it and the barn —shown at the right of the picture—is quite a deep ravine. The distance between the house and the barn is considerable, being nearly 400 feet according to the scale of the Exhibit Ives Survey. Back of the barn is seen the mountain.

Photograph No. 2 is taken from the white fence shown at the side of the house, Photo. No. 1, and looking toward the north-east, the Chestnut Grove Cemetery, concerning which some testimony has been introduced, being shown in the distance somewhat to the left of the center of the picture, also the ravine at the foot of the hill on which the cemetery is located.

Photograph No. 3 is a front view of the stone dwelling-house shown in Photo. No. 1, looking north, and taken from the gate which opens out into the Valley Road. This view gives an idea of the distance of the house from the road, and shows clearly the cupola or observatory on top of the house and the roofed porch at the front of the house, both of which objects figure somewhat conspicuously in the testimony.

Photograph No. 4 is a view taken from the north-east corner of the stone house, looking in a slightly north-westly direction. This view shows the barn, the ravine or hollow between the barn and the house, the spring-house to the left of the barn, and also the ram-pit—the latter being located close to the post and rail fence, and beyond and nearly in line with a partly dead apple-tree having an inclined trunk.

Photograph No. 5 represents a view taken from the rail fence, shown in Photo. No. 3 as extending horizontally across the picture from the east side of the barn, and looking in a south-westerly direction. The ram-pit is shown in the foreground at the extreme right, close to the fence, the apple-tree with the inclined trunk just beyond it. The rear of the stone house is also shown, and where the man stands with a handkerchief in his hand, to the right of the house, is located the projecting iron pipe from which the water forced up by the ram is discharged, said pipe being shown very faintly to the right of the handkerchief. Above the top of the hill, to the extreme right, the tops of the trees in the peach-orchard are discernible.

Photograph No. 6 represents a view taken from a point near the bottom of the hill and looking in a north-westerly direction. In the foreground, near the rail fence, the square walled-up ram-pit is shown, the top of the ram itself being visible. The large building on the right is the barn, and the man with the uncovered head stands in the barn-yard. The building at the extreme left, in front of which a man is shown sitting on the fence, is the spring-house. The central building is the one marked "Log shed" in the "Ives Survey" plan.

Both sides agree, and the evidence negatives any other conclusion, that until the ram was actually ordered of Drawbaugh by Draper and Kissinger there was no piping of any kind procured or contracted for, no trenches dug, and no preparatory work whatever done on the Draper farm in expectation that a ram would be put in. All these things are admitted to have been done after the ram was ordered, whenever that was.

If, therefore, the court shall find from the evidence that prior to the fall of 1877—the time when complainants claim the ram was ordered—timber was cut and bored for the wooden piping, or that the iron pipes for the ram were procured, or that the ram was brought, or that it was put in and set in operation on said farm, the theory of the complainants in regard to the only material point in the controversy, namely, the date of the ordering of the ram, will be completely annihilated, and by just so much earlier than 1877 as the preparatory work for the ram, or the actual putting in of the ram, shall be proven to the court to have been done, by just so much will the clear and positive testimony of Draper to the ordering of the ram in 1874 be corroborated and strengthened.

A large number of witnesses have been examined in support of defendants' theory, and their testimony will now be considered as briefly as is consistent with clearness.

We have already noted what Mr. Thomas Draper testifies concerning the ordering of the ram. What he has to say about the preparations made on the farm after the ram was ordered will now be adverted to.

He testifies that he was in Marysville in April, 1875 (D. S. rej. 169; A. 18, 173; A. 32), and that while there on that occasion Mr. Kissinger showed him some small chestnut saplings, six or eight in number, which he had cut and hauled up near the barn wall, and which he said were for piping to run the water from the spring to the ram, and he also showed him an auger which the pipe boring was to be done with, but which Mr. Kissinger said was out of fix; that he told Kissinger that by the time he bored these logs there would be nothing but sap left, and that he, Draper, didn't wish to put in piping of that kind, and that they had better be used for something else or larger ones cut. He further testifies that he told Kissinger that on his way back to Philadelphia he would see if he couldn't get some terra-cotta piping that would answer as well as the bored chestnut logs, and perhaps would be cheaper, his idea being that terra-cotta piping could be used both between the spring and the ram and from the ram to the house; that when he got to Philadelphia he went over to Camden to order some decking for the "Anna E. Draper," a new schooner he was then building, and seeing a pile of terra-cotta piping lying on the pavement, went in and inquired whether it would do for use in connection with the ram, and was informed that it would not do; that it might answer to convey the water from the sping to the ram, but would not do to go from the ram up to the house; that it wouldn't stand the pressure between the latter points.

He further testifies that, after returning home, he thinks he wrote Mr. Kissinger concerning the terra-cotta pipes, from the fact that he had found a letter from Mr. Kissinger to him, dated shortly afterward, wherein

Mr. Kissinger informed him that he had received his (Draper's) letter, and that he had been told that only iron pipes would do to go up the hill.

Kissinger's letter is as follows (D. S. rej. 169):

"May 30-75.

"Marysvill—

"MR. DRAPER:

"*Dear Sir,*—i received your Letter about the pipse "now they say none will do but iron to go up hil now I "can get some god ole pipe here, now i want you to "com up soon we got the pech tres al trimd and look "nice wot sho you some farmin this year rite sone no "more.

"Yours truly,

"GEO. KISSINGER."

This letter, when found by Draper among his papers in 1884, was shown to Kissinger, and he acknowledged it to be his, stating in the presence of three witnesses that he remembered all about it, and that the old iron pipes referred to in it were intended for the ram (Draper, D. S. rej. 191, X. Q. 86; Fenn, D. S. rej. 217, Q. 10; Church, D. S. rej. 257, Q. 3), though when subsequently called to the stand by the complainants he unblushingly denied making such admission (Kissinger, C. Vol. 3, 2406, Q. 21). The fact that Draper was in Marysville, at Kissinger's, in the spring of 1875, as he alleges, is admitted by Kissinger himself on his recall (C. Vol. 3, 2405, Q. 7, 8, 14), though he remembered nothing about it when first examined. The fact that Draper, on the occasion of that visit, showed Kissinger how to trim the peach-trees, referred to in the letter, is also admitted by Kissinger (C. Vol. 3, 2412, Q. 86), and the fact that Draper's vessel, the "Anna E. Draper," was in process of building when he went to Camden, on his return home in the spring of 1875, to order the decking, and saw the terra-cotta piping, is proven by indisputable record evidence, namely, Draper's account book, which shows that the timbers for said vessel were gotten out early in Nov., 1874 (D. S. rej. 171); the bill of Cresson & Ross, which shows that the iron for the vessel was bought Dec. 10, 1874 (172), and the bill of Brown & Taylor, which shows that the vessel was rigged in July and August, 1875 (173).

These positive corroborations of Mr. Draper show further that he is one whose memory can be relied upon in the matter of dates. His testimony on the subject of the wooden pipes, standing alone, is entitled to great weight, and when the court comes to compare it with that of George W. Kissinger, we think it will not hesitate long in deciding which to believe.

That he did see the logs for the ram-pipes in the spring of 1875, and that he and Kissinger at that time did converse about them and the ram that had been previously ordered, must certainly stand proved as against mere denial of those facts on the part of Kissinger, especially in view of the latter's proven admission of the fact, and of his character for unreliability and untruthfulness already shown.

Mr. Draper does not pretend to testify positively as to when the ram was first actually put in.

His impression when first called to the stand was that it was certainly not put in before 1875, as he knew there was a good deal of delay on Kissinger's part in getting the log pipes bored (D. Vol. 2, 1125, Q. 9).

The testimony of others of defendants' witnesses shows that his first *impression* was pretty nearly right. Subsequently, after complainants' agents had been to see him and had argued the case to him *ex parte* from the record, he wrote Mr. Storrow that he thought the ram was not put in till 1878 (D. S. rej. 253), but when recalled by defendants he said his impression was that it was put in either in 1877 or 1878 (D. S. rej. 183, X. Q. 56).

He was not there when the ram was put in. He don't pretend at any time to have an independent recollection as to just when the ram was put in, and his mere impressions about it not only do not detract from the force and value of his positive testimony on other points, but in fact strengthen such testimony, by showing that, unless fully satisfied he is right, he will not testify positively to anything.

Joseph Gensinger (D. S. reb. 767), another witness produced in behalf of the defendants, testifies that in the year 1875 he was tax-collector for the borough of Marysville, and that he was never tax-collector thereafter; that there were put in his hands for collection that year the school building and borough taxes. He produces the original warrant authorizing him to collect the school tax, and it is dated July 16, 1875 (769). He also produces his school and building duplicate tax book, and the borough duplicate tax book for 1875, which show that Thomas Draper was taxed that year for real estate valued at $6,000; that his school tax was $36, his building tax $36, and his borough tax $24.

He further testifies that he collected the tax that year on the Draper property of George Kissinger, who lived on the property at the time; that he went around to notify everybody who was taxed as soon as the tax duplicates were placed in his hands; that it was in the latter part of July or beginning of August, 1875, that he went to notify Mr. Kissinger; that he found Mr. Kissinger down at the side of the barn next the spring, in the barnyard, boring wooden pipes; that he asked Mr. Kissinger whether he was to look to him or to Mr. Draper for the tax, and that he replied that he was to get it of him (Kissinger); that he then asked Kissinger what he was making, and he replied that he was making pipes, and that they were going to put in a ram to force water up to the house; that he then asked Kissinger what a ram was, and he explained it to him. He further testifies that during his conversation about the taxes and the ram both he and Kissinger sat upon the log which Kissinger was boring when he went there, the log being supported on two trestles.

The character of Mr. Gensinger's errand on the occasion of this visit to Mr. Kissinger's, the fact that he was not well acquainted with Mr. Kissinger at that time (772, X. Q. 37), and the further fact that on that occasion Mr. Kissinger explained to him what a hydraulic ram was—a contrivance which he was then unfamiliar with—are all circumstances calculated to fix that particular visit and the association of the occurrences thereof in his memory.

The borough tax of $24, noted in the tax book produced by witness, and which witness says Kissinger agreed to assume, appears to have afterward been charged by Kissinger against Draper, for in the account for 1875, taken from Draper's diary (D. S. rej., 178), an item of $24 for such tax occurs.

John H. Harper (D. S. reb. 653), in the years 1875 and 1876, lived upon the Fenn farm, which adjoined the Draper farm, in the borough of Marysville. During the first year he lived there he farmed the place for Theophilus Fenn, Sr., and during the second year for Theophilus Fenn, Jr. In the summer of 1875, about August or September, while he was farming the farm for Theophilus Fenn, Sr., he took a breed sow up to Kissinger's to be covered by Kissinger's boar. Mr. Kissinger saw him coming, and opened the gate for him. They turned the sow into the field back of the barn, and sat down and watched her fully an hour and a half, until she was served. While watching her they sat upon some pipe logs that Kissinger was boring. These logs were supported on trestles, and were from 12 to 18 feet in length, five or six inches in diameter, and were of chestnut timber, some of them being bored and some not (654). Kissinger told him at that time that the pipes were intended for use in connection with a ram for running the water to the house from the spring. The pipes were located beside the gate through which he turned the sow into the field (see Complts.' Exhibit Ives Survey. C. Vol. 3, 2450), and he judges the time of the year from the size of the cabbage and tobacco in a truck-patch which he and Mr. Kissinger at that time inspected (654, Q. 15–19). He knows that he bought the sow while he farmed for old Mr. Fenn, and that Kissinger's was the first place he took her after he bought her; that the sow had but two litters, the second one being in the summer of 1876. He swears positively that he never took a breed sow to Kissinger's except on the occasion mentioned, and that when he moved from the Fenn farm, in the spring of 1877, he left her on the place. The last time he was on the Draper farm previous to his removal to Duncannon, Pa., was in the fall of 1877, when he went up there one Sunday, by way of the cemetery, with young Theo. Fenn for some cider and apples. On that occasion, however, he did not see Mr. Kissinger, nor any one else on the place.

He moved from Marysville to Duncannon the last of February, 1878, and his household goods were shipped there by railroad (657 Q. 40, 41). The exact date of his removal is positively fixed by the shipping-books of the R. R. Co. at Marysville, which show that his goods were shipped to Duncannon on the 27th of February, 1878. He was never back on the Draper farm after he removed to Duncannon till long after Kissinger had left the place (656 Q. 36).

The whole of this witness' deposition is very clear, and as he testifies with positiveness, his testimony should be given great weight.

He is corroborated in regard to living on the Fenn farm between April, '75, and April, '78, by Theophilus Fenn, Jr. (see Fenn, D. S. reb. 776, 777.) Fenn also remembers the circumstances about Harper taking the breed sow up to Kissinger's to be served. He says that the sow in question was black, and the only black seed hog in that county was at George Kissinger's; and it was through a desire to raise black hogs that the sow was taken up to the latter's; that he saw Harper start off with the sow, and saw him return with the same; that Harper informed him that the sow had been served; that he knows of his own knowledge she got with pigs after it; that these pigs were appraised to him on the 31st day of March, '76, the date being fixed positively by an entry in his books of the appraisement (779.) His book also shows that those pigs were butchered on the 12th Dec., 1876 (778.) Fenn also says that the farm on which Harper lived was sold early in 1878 to Abner Cassell, and that Cassell took possession April 1st, 1878. Cassell is called (D. S. reb. 797), and produces the deed of the property from Theophilus Fenn, Sr., and wife to him, and it is dated Jany. 9th, 1878.

James Champion (D. S. reb. 594) moved from Dauphin Co., Penna., to Marysville, in March, 1876, this date being fixed by an entry in the freight book of the R. R. Co. at Marysville, showing that his household goods were received in Marysville by the Northern Central R. W. Co. on the 28th of Mar., 1876 (Geib, D. S. reb. 1134, Q. 1.) He first occupied Widow Leah Miller's house; lived there about a year and then moved into John S. Weaver's house. While he lived in Widow Leah Miller's house, James Zimmerman, George W. Kissinger's son-in-law, took dinner with him, and the subject of Mr. Champion's water-supply being brought up, Zimmerman mentioned that Kissinger was going to get a conveyance for carrying the water up the hill to the house. Such conveyance was what the witness called a battering-ram, but Zimmerman called it a hydraulic ram. The same day, after dinner, he accompanied Zimmerman home to the Draper farm, but nothing further was said with reference to the ram. About the 1st of June, 1876, he and his wife went up to Kissinger's house on the Draper farm to get early cherries. They did not get any, but arranged to come and get late ones. In the early part of July, 1876, he made a third visit to Kissinger's, accompanied by his wife and two daughters, for the purpose of picking cherries, and in going from the house to the barn he showed his wife where the spring was that Zimmerman had mentioned. They then passed up the hill and through a gate (see Ives Survey) into a field; and when they had passed the gate they saw some timber lying on the ground, and his wife asked him what it was for, some work having been done upon it. The timber, most of it, was bored through lengthwise, and he told his wife that it was for pipes for conveying the water up the hill.

Witness worked for Leonard Swartz from June, 1877, off and on until the fall of that year, his last work for Swartz being done two days before he was burnt out of John S. Weaver's house (597); *i. e.*, December 1, 1877 (see Weaver policy of insurance, D. S. reb. 592). While he was working for Swartz, and some time after wheat harvest, he went over to Kissinger's to get a plow, taking a path across the peach orchard to the barn (see Ives Survey) to avoid Kissinger's bad dogs. Saw Zimmerman going to the spring for a bucket of water, and the latter told him that the water conveyance or hydraulic ram was out of repair, and it was more bother than it was worth (602 Q. 63). The fifth and last occasion witness was at Kissinger's he got some pumpkins, a portion of which were afterwards destroyed by the fire of December 1, 1877.

Mrs. Sarah J. Champion, wife of James Champion (D. S. reb. 117), produces a rent receipt (608) showing that she lived in Widow Leah Miller's house in May, 1876.

She corroborates her husband in regard to the conversation with Zimmerman about the ram at that house; also in regard to the two visits for cherries at Kissinger's, and in regard to seeing the log pipes at the second visit for cherries; and testifies that she was never at Kissinger's except upon the two occasions mentioned. In regard to the location of the logs, says they were but a short distance from the barn, lying on the ground but not piled up.

Mrs. Mary McFarland (D. S. reb. 728) moved from Dauphin, Penna., to Marysville, in June, 1876, and moved from the latter place to New Market, Cumberland Co., Penna., in April, 1877. Both of the dates are fixed positively by the R. W. books, which show the transfer of her household goods on two occasions mentioned. While residing at Marysville, between the dates mentioned, she went with her husband and sister to pick cherries at Kissinger's, and there met Mr. and Mrs. James Champion and their daughters, the youngest of whom was about eight years old at that time. She saw bored logs lying in the field near the barn, on the right-hand side of the barn, toward the river, and saw Mrs. Champion's little girl playing upon the logs and sticking sticks in the holes in the ends of them. The witness has never resided in Marysville since she moved away from there to New Market, in April, 1877 (729 Q. 9), and has also never been at the Kissingers' place since that time.

John Peffley (D. S. reb. 640) moved to Marysville some time prior to 1874, and he lived there until about the first of July, 1876, when he moved away, and remained until October, 1883, when he moved back to Marysville. He is a shoemaker by trade, and was working for Herman Eppler at the time he left Marysville in 1876, but just previously had had a shoe-shop of his own, which he sold out to Eppler in April, 1876, as shown by an entry in a book kept by him (642). (See also Eppler, C. Vol. 3, 2206, X Q. 247.) While he was living at Marysville, and before he moved away, in July, 1876, he became acquainted with the Kissinger family; was often with the Kissinger boys, and used to go up to the farm to get fruit. In the summer of 1876, before he left Marysville, he saw a ditch between the house and the spring, and also saw wooden pipes lying around at the barn and at the ditch. The ditch ran in a straight line from the house down to the hollow, and then made a bend and ran over to the spring; heard people talking about the pipes, and understood that they were for a ram. The witness was never on the Draper farm after he moved from Marysville, in July, 1876, until he came back to Marysville to live, in the fall of 1883, when he went up there with Squire W. K. Fenn to show him where he saw the ditch and pipes in 1876, and while there with Squire Fenn saw the ram in a hole in the ground at about the spot where he saw the bend in the ditch in 1876.

Josiah M. Bruner (D. S. reb. 614) went to Marysville to live February 27, 1874, and lived there until February 28, 1877, when he moved to Duncannon, Pa., shipping his household goods and effects there by rail. The date of his moving to Duncannon is fixed positively by the railroad books at Marysville (see Geib, D. S. reb. 1134, Q. 2). He was engaged in the butchering business from the time he went to Marysville till May 13, 1876; he produces his butcher book, which shows that his last day's business at Marysville was May 13, 1876. From the time he went out of the butchering business till the fall of 1876 he was engaged in buying and selling live stock; bought and sold sheep mostly, and those he had near Marysville were pastured on the Draper farm, then occupied by Mr. Kissinger. He frequently went to Mr. Kissinger's place to look after his sheep, going past the house to the fields by and beyond the barn. Remembers that at that time there was an open observatory on the top of the house, consisting of a railing about three feet high, and without glass walls or roof (617, Q. 32, 33.) (This railing was taken off the house in September, 1877. Brabson, D. S. reb. 969.) Some time about August, 1876, when the witness was up at Kissinger's to look after his stock, he noticed a hole dug in the hollow below the house; asked Kissinger what he was going to do with the hole he had dug, and Kissinger replied that he was going to put a ram in to force the water up to the house; he then asked Kissinger why he did not put it up near the spring, and he replied that he had put it down where the hole was, in order to give the water fall enough to force it up to the house.

Kissinger then showed him some sticks of timber that he intended to use for the pipes from the spring to the ram (617), and he thinks that one of the sticks of timber was lying on trestles at the time. He doesn't know whether the hole for the ram was complete or not, but knows it was in the hollow, and thinks it must have been about two hundred feet from the spring. Since this witness moved away from Marysville in February, 1877, and testifies that he has never been on the Draper farm since the fall of 1876, it is impossible that he could have seen the bored pipes at the time when complainants contend they were made—*i. e.*, in the winter of 1877-78.

Calvin Keim (D. S. reb. 733) worked for George W. Kissinger on the Draper farm in the fall of 1876, cutting off corn, and at that time saw the hydraulic ram in the hollow between the house and the barn. It was under ground and covered over with boards, and he looked through the cracks of the boards and saw it (735). He also at that time noticed a trench up near the house, and the ground lying up in a ridge by it. He fixes the date by the fact that for the work that he did for Kissinger at that time he was paid in corn in the spring of 1877, and he fed that corn to two pigs which he bought at Solomon Moyer's sale, on the 17th of February, 1877, as appears from an entry made in his memorandum book at the time (736), and butchered the pigs about the time of the holidays of the same year he bought them. He fixes the date of his working for Kissinger by the further circumstance that he entered the employ of the N. C. R. R. Co. on the 18th of August, 1877, has (733) worked steadily for said company ever since, and has never cut off any corn for anybody since that time (733, Q. 8), and has has not, in fact, done any work outside of railroad work since August, 1877 (737, X. Q. 46). He is corroborated by George W. Rhoads, another of defendants' witnesses, who testifies (D. S. reb. 1050) that he worked with him on that corn-cutting job at Kissinger's in fall of 1876.

George W. Hayes (D. S. reb., 850) is a blacksmith. In 1876 and 1877 he was employed as a night watchman at the coal-shutes of the N. C. R. R. Co. at Marysville, and while so employed, some time about May or June, '76, he had a conversation with Mr. George W. Kissinger, in which the latter said he was then boring pipes. In a subsequent conversation with Kissinger, about the middle of the summer of the same year, Mr. Kissinger told him that he was going to fetch the hydraulic ram. All these conversations occurred while he was working at the coal-shutes, and the time that he worked there is positively fixed by the books of the R. R. Co., which show that he commenced work March 17, 1876, and continued to June 30, 1877, when he quit the services of the Co., since which he has not worked for the Co. (see Dickinson, D. S. reb., 837).

William Hess (D. S. reb., 946) has lived in Marysville since 1870, and is an employe of the N. C. R. R. Co. He was out setting rabbit-boxes and snares in the fall of 1876, and on his way home met Josiah M. Bruner and Stiles Fesler, on the road leading to Mr. Kissinger's, and they all three went on Kissinger's place to look after some sheep that Bruner and Fesler had there. They went in by the house and down to the barn (948), and between the house and barn, and close to the run (see Photographs Kissinger's place, Nos. 4, 5, 6), witness saw the ram. It was boxed up in the ground. He asked Bruner and Fesler what it was for, and they told him it was to force water to the house, to save the women from carrying it up from the spring (948). The witness swears he was never down where the ram was after that; was never afterwards at the Kissinger house but once, and that was in the evening.

He has been continuously employed by the R. R. Co. since Sept. 26, 1877, and he says it was about a year before he went to work there that he saw the ram. He must be correct in his dates, as Bruner, who went to Kissinger's with him to look after the sheep pastured there, testifies that he only pastured his sheep at Kissinger's at times between May 13, 1876, and about the first of Nov., 1876, and that at the last-named date he went out of the business (D. S. reb., 616), and moved away from Marysville in Feb. 1877. Fesler, the other party who was with him when he saw the ram, testifies that he only pastured sheep at Kissenger's place from the middle of August, '76, till 5 or 6 months thereafter.

Stiles L. Fesler (D. S. reb., 865) resides in Marysville, and is a butcher. He began butchering on his own account about the middle of August, 1876, and continued five or six months. During that period he pastured sheep on the Draper farm where Kissinger lived, and after that never pastured any sheep there. While he pastured sheep at Kissinger's he sold Kissinger meat, and he produces his books of account, showing charges against Kissinger for meat furnished between Aug., 1876, and October of the same year (866). One day when he went up to the farm to look after his sheep he saw Kissinger in his shirt-sleeves digging with a shovel below the house, and Kissinger told him he was trying to fix the ram that was intended to force water up to the house. Kissinger said it did not work as it was intended to, that the pipes leaked, were not jointed right, or else the water did not have force enough; he did not know what the trouble was. He then left Kissinger, went over to the spring, got a drink, and noticed the pipe in the spring; then went back and told Kissinger he could not understand how they could get the water up to the house. Kissinger told him that the water was to empty into a half-barrel that could be seen standing up near a little dry-house, and if the ram would work it would save the women lots of trouble.

Edward L. Gault (D. S.-reb., 869) is a clerk in a dry-goods store in Marysville. From childhood until 1881 he lived with his father on a farm in Rye township, Perry Co., Pa. The Draper farm, on which George W. Kissinger lived, was between his father's farm and the village of Marysville. In 1876, in warm weather, he was in search of some lost cattle along the south side of Cove Mountain, towards Marysville, and, following along the mountain, came to the Draper farm. He went down to the barn and to a place where he saw "a middling old man, not very tall," at work fixing a ram. He stayed there about half an hour, and assisted the man by holding a wrench, to keep the pipe from turning. The man told him that the ram was full of dirt; and he took out the dirt and put the ram together again, and it worked. The man said the ram should not have been out of repair in so short a time.

The witness also says, that the ground between the ram and the house had been dug up at several places, and at one place, about one hundred feet from the ram, was still open for about three feet. He looked into this opening and saw an old pipe lying in there. The man said that the pipe was an old one, and that it leaked where they had dug up the ground. The witness speaks of seeing two pipes in the ram-pit, a large and a small one, which were evidently the inlet and the outlet pipes.

The weakest kind of an effort was made by complainants to rebut Mr. Gault's testimony by the surveyor, Mr. Ives, who made the survey of the Draper farm for them while they were putting in their closing testimony in June, 1884. He was asked the following question (Ives, C. Vol. 3, 2,454):

"Question 17. You say you particularly noticed the water-ram on the farm, and the pipes connected therewith. Please say whether or not you saw any pipe connected therewith having a cap or nut, and which pipe it would be either necessary or useful to hold by means of a common wrench to prevent it from turning while unscrewing said cap or nut?" He answered as follows:

"A. I saw no pipe which could be grasped by an ordinary wrench in a manner to assist in the operation of unscrewing the mentioned cap or nut."

In the dilapidated condition in which the ram was in 1884, it was quite probable that there was no pipe to be seen having a cap or nut, and at the time mentioned it is doubtful if there were any pipes at all connected with the ram.

Mr. Gault, in his testimony, did not say that either he or the man at work at the ram unscrewed a nut. What he did say was, that he held with one wrench one of the pipes connected with the ram, while the man with another wrench was "unscrewing and taking off the cap—by cap I mean the top where the pipe was connected with the ram" (Gault, D. S.-reb., 861, Ans. 25).

What the man did, probably, was to take off the top, or long vertical part of the ram, and clean it out, for Gault says he took the dirt out by means of a rod or stick (864 and 68).

The man whom he saw working at the ram on that occasion is not further identified than by Gault's description of him, but it is left with the court to determine whether that description does not apply accurately to Mr. Drawbaugh, the person who is alleged, even by complainants' witnesses, to have been the one who put in the ram.

Peter Kaffenberger (D. S. reb. 914) resides in Steelton, Dauphin Co., Pa. In April, 1874, he bought of John Harold and wife a farm in Rye township, Perry Co., Pa. He produces the deed, and it is dated April 1, 1874 (915).

At the time of its purchase he went to live on that property. It was about a mile from the Draper farm. In the fall or winter of 1875 he began to dig a well on his farm, and after he had gotten down five or six feet an old miner came along, a Welshman named Roberts, and looked in the well, and took some of the clay that had been thrown out of it and went away; returned shortly, and asked him for a lease for mining fire-clay; said that he wanted to sink a shaft. Witness gave him a lease, and he took away about three-fourths of a barrel of fire-clay and sent it to Marietta, Pa., to a man named Musser, his partner under the lease. Roberts and Musser stopped him from digging further at the well, as they wanted to use it as a shaft after they had tried the clay.

The finding of the fire-clay in his well caused considerable talk in the community, and a large number of people came up to see it, among others Mr. George W. Kissinger, who came up there one Sunday not long after the fire-clay was discovered. In conversation with Mr. Kissinger on that occasion he was relating to Mr. Kissinger how they had stopped him from digging his well, and that it was too far to carry water from his spring to his house, when Kissinger remarked that the distance from his spring to his house was only about the same as that from his, Kissinger's, spring to his, Kissinger's, house, and that he, Kissinger, was going to lay a pipe and fetch the water from the spring to the house with a ram, and that witness could do the same. Kissinger also told him that he was going to get his ram from Milltown. The lease to Roberts and Musser was for 20 years, but to be forfeited unless they began operations within 9 months. They did nothing after taking away the three-fourths of a barrel of fire-clay, and after the 9 months expired witness started in and finished the well, the job being completed during the winter of 1876. For a while he got water from the well by means of a windlass and rope, but in the spring of 1877, about March, he put in a force-pump. The date of the completion of the well is positively fixed by one of complainants' witnesses, Mr. Christian I. Heisley, who swears (C. Vol. 3, 1797, Ans. 35) that in Oct. or Nov., 1876, he walled up Mr. Kaffenberger's well, and produces his time-book, in which he says he put down his time every day after the work was done, containing the following entry:

1876. Peter Cafenberger,	*Dr.*
Oct. 11.—To one day	$1.25
Nov. 8.—To one day	1.25
9.—To one day	1.25
10.—To $\frac{3}{4}$ of a day	1.00
	$5.00

In the fall of the year 1876 the witness (Mr. Kaffenberger), about the time corn was in shock, went down to Mr. Kissinger's to see how his ram worked, and found Mr. Kissinger working in the front field, near the road. Mr. Kissinger said his ram was then working, and that he (witness) could see it. They together went around behind the house, and there saw the water dropping out from a pipe into a barrel that was standing not far from the house. He told Kissinger that it did not suit him; that it didn't discharge water enough. He did not go down where the ram was, but went off home, *and after that time finished his own well.*

His testimony in regard to the time when Roberts and Musser had the lease is corroborated by an original letter to him from Musser, which is dated Jany. 8, 1876, at Marietta, Lancaster Co., Pa., and is spread upon the record in full at pages 920, 921, D. S. reb.

The details and circumstances related by Kaffenberger seem so striking and peculiar, and the dates which he gives are so positively fixed, that we cannot see how he can possibly be mistaken.

Unsupported, his deposition is entitled to great weight, but taken in connection with the depositions of other witnesses who testify to the existence of the ram in 1876, the fact that the ram was there at that time must be held to be proved.

John Kaffenberger (D. S. reb. 952) resides in Steelton, Dauphin Co., Pa., and is a son of Peter Kaffenberger. He lived with his father, in Rye township, Perry Co., while Mr. George Kissinger lived on the Draper farm. In the year 1876, between harvest and corn-cutting time, he and his brother, William, since dead, were driving down the Valley Road to Marysville with a horse and spring-wagon, and met Mr. Kissinger about half-way between the Draper farm and Marysville coming up in a two-horse farm-wagon. They stopped, and he asked Kissinger what it was he had in his wagon, and Kissinger replied it was a ram for pumping water up to the house.

About October, 1876, witness and his brother went down to Kissinger's place to make some cider, and used his, Kissinger's, cider-mill, which was standing under a large cherry tree at the lower part of the orchard, about two-thirds of the way from the house to the spring. They were attracted by the noise of the ram, and went down to see it, and found it in a hole in the ground, which was laid up with loose stones.

He knows it was in '76, for the same day he went to John Sitterly's to use his cider-mill, and found that Sitterly's mill was out of order and that he had gone to the Centennial Exposition, whereupon they went to Kissinger's as stated.

The complainants have endeavored to destroy the effect of this deposition by recalling Peter Kaffenberger, the witness' father (C. Vol. 3, 2,477), to prove that the particular spring-wagon which the witness said he and his brother were in when they met Mr. Kissinger bringing the ram had been sold previously by Mr. Kaffenberger to Mr. Kissinger, but it is not by any means clear from his testimony that the wagon had been sold to Mr. Kissinger previously.

The most that Mr. Peter Kaffenberger was able to say upon the subject was, that he sold a horse in March, 1876, and, rather indefinitely, that the wagon was sold two or three months after that date; but Mr. Kissinger himself says he didn't buy the wagon till the *fall* of 1876 (C. Vol. 3, 2,411, Q. 70). Although it would have been possible for the witness to have made a mistake about the particular wagon he happened to be driving in, wagons being common things, and his father probably owning two or three of them, it is not at all probable that he would make a mistake about having seen the ram in Kissinger's wagon, and having conversed with Kissinger about it, in view of the fact that the ram was an object not often seen in that community, it being admitted on all sides that Kissinger's ram was the only one that had been put in, in or about the borough of Marysville.

William H. Meals (D. S. reb. 800) testifies that he is a drop-hammer man, and resides at Springfield, Ohio; that he formerly lived in the borough of Marysville with his father, in a house on a corner of the Draper farm, on the top of the hill towards the village of Marysville. His first knowledge of the Kissinger ram was obtained in the year 1875 or 1876, when he heard Mr. Kissinger tell his, witness,' father, since dead, that Mr. Draper had bought a hydraulic ram to throw the water from the spring to the house; that it had become too hard to carry the water up the hill. In the latter part of the summer of 1876 he worked for Mr. Kissinger, and helped to dig the trench between the ram and the house, digging about half-way between the ram and the point where the pipe comes out of the ground near the house. The trench had been previously dug from the point where he worked to the ram, and from the ram to the spring.' This was before he went to work for Mr. Ezra Gilbert at Milltown, and he worked for the latter, according to the latter's books of account, from Aug. 3 to Oct. 7, 1876. (Gilbert, D. S. reb. 727.)

In October, 1876, he again worked for Kissinger, and at that time the trench, which he had helped to dig previously, was covered from the part where he had worked down to the ram, and in the other direction to about half-way up to the house. He thinks it was also covered between the ram and the spring. The ram had been put in at that time, and while he didn't see the ram he saw the water coming out of the spout near the house, and by that judged that the ram was working. About half-way from where he had helped dig to the house he saw the iron pipe running over boxes or trestles. He again worked for Mr. Kissinger in '77, about 3d of May. The ram at that time was covered with corn fodder, and Cyrus Kissinger uncovered it and told him it was broken; that it had been frozen the winter before.

Theophilus Fenn (D. S. reb. 775), testifies that he resides in Philadelphia, and is a salesman for Baxter C. Swan; that he is a son of the late Squire Theo. Fenn, formerly of Marysville, and a brother of the present Squire William K. Fenn, of Marysville. He lived in Marysville from 1874 till January 1st, 1879. During a portion of that time his mother owned a farm in the borough of Marysville, which, from April 1st, '75 to April 1st, '76, was farmed for his mother by John H. Harper and Christian McAllister, it being divided into two distinct parts, one of which Harper farmed, and the other of which McAllister farmed. From April 1st, '76, till April 1st, '77, the witness rented both parts of the farm from his mother, subletting one part to John Leonard and occupying the other part himself in connection with John H. Harper, who worked it for him. From the 1st of April, '77, to April, '78, that farm was rented to J. W. Crossly and John Leonard; and early in '78 it was sold to Abner Cassell (see Deed Cassell, D. S. reb. 799). After witness quit farming, in the spring of 1877, and until he went to live with his father, in the fall of '77, he boarded with John H. Harper, near the upper station at Marysville (784). From the fall of '77, till the 1st of January, '79, when he went away to Philadelphia, he lived with his father.

Either in 1876 or 1877, in the fall of the year, he called at the Draper farm, where George W. Kissinger lived, on business, and Mr. Kissinger directed his attention to the ram and showed it to him. The ram was not working when they went to it, but Mr. Kissinger started it, and it apparently did not work well. Witness saw a pipe that led from the ram towards Kissinger's house, and when the ram was started a very small stream of water, about the size of a goose-quill, would issue from the end of the pipe nearest the house. The end of the said pipe was straight, and was raised up and rested on an old half-barrel or box. Kissinger at that time said the pipes were old and had frozen and bursted; that he would have to get others, and expected the ram would do better service, as the pipe would not then lose its water. Witness at that time also saw the end of a large wooden pipe in the spring, and Kissinger said that it fed the ram. He inquired of Kissinger the cost of putting in a hydraulic ram, with a view of putting in a *ram on his mother's farm.*

He knows positively that this conversation could not have occurred after the year 1877, because the knowledge of the cost of the ram would not have been worth the asking at a later date, his mother's farm having been sold in January, 1878. The witness further testifies that when, about the middle of September, 1878, a commission met at Marysville to look at several proposed cities for a state penitentiary, and a question was raised as to how water could be supplied to the Cassell farm, he suggested, among other things, that water might be carried up from Fishing creek by hydraulic-ram power, his mind at once reverting to the Kissinger ram which he had previously seen. The date of the visit of this penitentiary commission is fixed positively by an entry in the minute book of the commission as being September 27, 1878 (see Hart, D. S. reb. 1,131).

The witness has no recollection of being up to Mr. Kissinger's between the time he quit farming and the time he moved to Philadelphia, except a faint recollection of being there one Sunday with Mr. John H. Harper. He is probably correct as to his visit with Harper, as Harper testifies to being up there one Sunday with him, in the fall of 1877, for the purpose of getting cider and apples (see Harper, D. S. reb. 655, Q. 28).

Oliver H. Miller (D. S. reb. 577) is a resident of Marysville, and was at one time constable. Between the years 1874 and 1880 he kept a team and did hauling of various kinds. From June 18, 1874, until October 1st of the same year, a man named Aaron Ahn was employed by him, and after October, 1874, never worked for him. He produces a book containing entries fixing these dates (579). In that same year, 1874, he farmed a part of a field for Mr. Kissinger, on the Draper farm. One day while his hireling, Ahn, was at the Draper farm working the corn for him, he went up to see how he was getting on; and while he was there Mr. Kissinger came to the field, and they both got on the fence and engaged in conversation; that presently he became dry, and asked Mr. Kissinger if there was a tin at the spring, that he wanted a drink. Kissinger said there was, and said he would go with him. On their way over they met one of the women, whether one of Mr. Kissinger's daughters or his wife he does not remember distinctly, carrying two buckets of water. He said, "Mr. Kissinger, that's too hard work for women; why do you not make Mr. Draper dig you a well?" And Mr. Kissinger replied, "We are going to have something better than that. Mr. Draper promised to have me a battering-ram put in to throw the water up to the house."

The particular value of this witness' testimony is, that it proves that in the first year that Mr. Kissinger lived on the Draper farm the subject of putting in a ram was discussed by Mr. Draper and Mr. Kissinger; and it tends to greatly support Mr. Draper's testimony, to the effect that in the summer or fall of the year 1874, when he was up at Marysville, and after Kissinger's complaint about carrying the water, he and Mr. Kissinger went over to Milltown and ordered the ram of Mr. Drawbaugh.

John H. Rhoads (D. S. reb. 851) testifies that he resides in Rye township, Perry county, Pa., and is a laborer; that between the 1st and 15th of October, 1876, while employed by Seidel Bros. in sledding wood on the Kell tract, he and a man named Leo. Lantz, who was helping him on that job, took a day off for fishing; that they caught some small bait-fish, and on their way to the river stopped at Kissinger's spring to give their little fish some fresh water; that he noticed that the spring had been freshly walled up, and that there was a tin screen in the bottom of the spring; that he said to Lantz, "There is a new arrangement there," and that Lantz told him that what he saw in the spring was the pipe they had laid down to a ram, which forced water up to the house. He also testifies that at that time he saw a line of fresh ground where the pipes had been covered.

The books of Seidel Bros., his employers, show that they settled with Mr. Rhoads for his work on the Kell tract Jan. 6th, 1877, and Mr. J. Harper Seidel, one of the firm, testifies that the job was finished some time during the winter of 1876–7, and before Jan. 6, '77 (Seidel, D. S. reb. 849).

Joseph W. Rhoads (D. S. rej. 156) testifies that he is a laborer; that in 1876, and up to the time of the holidays of that year, he lived at Churchville, Dauphin county, Pa., and produces a rent receipt dated Churchville, October 23d, '76.

He further testifies that while he lived at Churchville he worked in the hammer-mill at Steelton, and produces a time book (158) showing that the last work he did there was on the 24th November, 1876.

He further testifies that between Christmas, '76, and New Year's, '77, he moved to Marysville, where he has since lived; that in October, '76, before he moved to Marysville, he went over to the latter place to visit his relatives, who lived there; that he got off at the upper Marysville station, and from thence went by a road called the "backway" (159) to his brother's John H. Rhoads, who lived about 2¾ miles above Marysville; that in going up to his brother's he crossed the Draper farm and stopped at the spring to get a drink; that he noticed that the spring was walled up, and that a pipe was in it with a screen over it; that when he got up to his brother John's he told him what he had seen in the spring, and said he thought the pipe was to carry water into the barn-yard; that John said it was not for that purpose, but to carry water to the house. The back road to which this witness refers is now closed (163), but its previous existence is testified to by complainants' witnesses, James C. Zimmerman (C. Vol. 1, p. 634, Q. 117), L. Swartz (C. Vol. 3, 2393, X-Q. 27), and by defendants' witness, Peter Kaffenberger (D. S. reb. 925, X Q. 102).

Edward Crist (D. S. reb. 853) testifies that he works on the Pennsylvania railroad, and has lived in Marysville since Dec., 1870; that from May 20, '76, to March 20, '77, he worked for Mr. Theophilus Fenn; these dates being fixed positively by Mr. Fenn's book (Theo. Fenn, D. S. reb. 779, Ans. 27).

In December, 1876, he was sent up to Mr. Kissinger's by Mr. Fenn to get a breed sow served by Kissinger's boar. He did not get her served, because the boar had been altered, and he had to take her to Daniel Sanders' boar. Witness says that when that sow had her litter of pigs from the service at Sanders', Mr. Theo. Fenn had given up the farm, and Mr. W. K. Fenn, into whose hands the sow came, got the litter. He also says that when he took the sow up to Kissinger's he saw water flowing into a barrel back of the house from an iron spout, in a stream about as big as his little finger.

It further appears that in May, '77, he worked four or five days for Kissinger, planting corn, and took his meals at Kissinger's house. At that time the water which they got for drinking purposes and for washing their hands was obtained from the barrel, where the water was discharged from the ram and the ram was working. He never helped Kissinger plant corn but that once.

He again worked for Kissinger in the fall of '77, about two weeks, gathering peaches, and saw the ram there at that time, but it was not working.

John K. Keim (D. S. reb. 893) testifies that he resides in Steelton, Dauphin county, and works for the Penn. Steel Co.; that from April 1, 1877, to April 1, 1878, he lived with his uncle, George W. Crossley, upon the Fenn farm in Marysville, moving both on and off the farm when Mr. Crossley did.

These dates are fixed positively by Theo. Fenn (Theo. Fenn, D. S. reb. 777) and by Abner Cassell, who bought the Fenn farm in '78 (Cassell, D. S. reb. 800, Ans. 4).

While he was living with Mr. Crossley the witness says he helped Kissinger thresh and to put out the seeding, getting breakfast at Mr. Crossley's, and dinner and supper at Mr. Kissinger's. The water which was used by the Kissinger family at that time was brought from the spring in buckets. He heard the men in the barn say that the water had been previously brought up in pipes, and at meals heard the Kissinger woman say that the pipes were "out of fix." At that time he saw a metal pipe that came up from the ground close by the house, which had something like an elbow on it, and high enough so that a tub could be placed under it.

He has never been on the Draper farm since he moved off the Fenn farm with Mr. Crossley, April 1, 1878.

Henry Shaffer (D. S. reb. 872) is car inspector of N. C. and Pa. R. R. Co.'s at Marysville, having occupied that position twenty-four years. In 1877, about harvest time, Mr. George W. Kissinger came to him to borrow a pair of pipe-tongs, saying he wanted to unscrew some pipe that were connected to his ram; that it had rusted so tight he could not unscrew it. He lent him the pipe-tongs, and he returned them in about half a day.

In the summer of 1878 he saw either Kissinger or James Zimmerman, he don't distinctly remember which, loading some pipe at the Marysville station on a two-horse wagon.

Inasmuch as it is the contention of the complainants that James Zimmerman hauled from the Marysville station, some time in September, '78, the first and only iron pipes that were used in connection with Kissinger's ram, the deposition of this witness is valuable in rebutting their theory, by showing that a year before September, '78, Kissinger borrowed tools for unscrewing old rusted pipe that were already connected to his ram.

Henry Gamber (D. S. reb. 739) resides in Marysville, and has lived there since 1869. He was in the butchering business from prior to Feb., '76, to July, '78, when he sold out to Mr. Joseph Gensinger, and never afterward did any butchering. The date of his selling out to Gensinger is fixed at July 9, 1878, by Gensinger's book (Gensinger, D. S. reb. 767).

On Sept. 26, '77 (742), he butchered a calf for Mr. Kissinger alongside the ditch between the ram and the house, and dressed it under an apple-tree, hanging the carcass on the tree (see Photos. Kissinger's Place, Nos. 4, 5, and 6, Ives Survey).

Kissinger kept the meat of that calf; and he (witness) took the skin and gave Kissinger credit for it, making an entry in his account book, which he produces, the entry being dated Sept. 26, 1877 (741).

He never butchered a calf for Kissinger either before or after that time.

At the time he killed the calf, Kissinger showed him the ram and ram-pipes, and said it was a pity the ram did not work. The ram was down in the hollow between the house and the barn, in a kind of wet place; it was in a square hole in the ground, and the hole was planked to prevent the dirt from coming in at the sides. The witness says he saw pipe up near the house, and about two feet of it stuck up out of the ground.

He thinks the pipe was lead pipe, but he was probably deceived by its appearance, as other witnesses prove it to have been iron pipe.

Stephen H. Morley, another witness (D. S. reb. 1120), says that he resides in Marysville, and is employed by the N. C. R. R. Co.; that from 1871 until the spring of '78 he kept store in Marysville, and lived over the store; that he was sold out at sheriff's sale in March, '78, and his brother, Thomas W. Morley, bought his stock of goods; that he did not live in the house but a few days after the sale.

The date of the sale is proven to have been March 12, 1878, by the original bill of sale, produced by Thomas W. Morley in his deposition (D. S. reb. 573). The witness further testifies that in the year 1876 or '77, and while he was keeping store, and living over the store, he and Theo. Fenn, Jr., started from his dwelling house over the store and went up to the Draper farm; that it was Sunday, and he thinks some time in October; that on that occasion he met Kissinger, who showed him the ram, which was then in operation (1121), and that there was talk about how the ram was to be prevented from freezing.

Another important piece of evidence in support of the defendant's theory is found in the testimony of William L. Taylor and Lewis B. Brabson, carpenters, and of George Curtis Strine, tinsmith, and of his helper, George W. Rhoads, all of whom assisted in building the front porch, and in reconstructing the cupola or observatory of the Kissinger house in the year 1877. The time when this work was done is indisputably fixed by record evidence. Taylor (D. S. reb. 1043) produces his book and shows that he worked on the job in Sept. '77. Brabson produces his book which shows he worked 8 days on the same job in Sept., '77 (D. S. reb. 970). Strine produces his day book, which contains an entry in Sept., 1877, for tinning the roof of the porch (D. S. reb. 997), and also produces a bill dated

Aug. '77, for the lumber that was used in the erection of the porch (997); while the Draper-Kissinger account for 1877, produced by Draper (D, S. rej., 178, and which Kissinger admits to be correct (C. Vol. 3, 2413) shows a charge of $103.50 for that particular job of work. Taylor testifies (1044), and also Brabson (970), that while they were at work on that job they breakfasted at home and took their dinner and supper at Mr. Kissinger's; that at that time the ram was in operation; and that while the water for cooking and washing was obtained from the ram, the water for drinking purposes was brought up from the spring by hand (Taylor, 1045); that one day when they sat down to dinner there was no water on the table, and Mr. Kissinger asked where the water was; that Mrs. Kissinger said one of the girls had just gone to the spring to fetch a bucket of water for the table; that Mr. Kissinger seemed to be a little cross because the water was not there when they sat down, and made the remark that the water the ram forced up not fit to drink because so warm (Brabson, 972).

Both Brabson and Taylor testify that they neither of them have taken a meal at Mr. Kissinger's since they worked for him on that job in 1877 (Brabson, 972; Taylor, 1047). Brabson says that while he was at work on the cupola of the house, he quite plainly heard the thumping of the ram while in operation (977).

Strine testifies that Rhoads assisted him in putting the tin-roof on the portico (998), and Rhoads testifies that while he was there assisting Strine on that job he had occasion to get water, and got it from a pipe that came up out of the ground 15 or 20 feet from the upper corner of the back of the house, between the house and the orchard, and that the last work he did at Mr. Kissinger's place was on that portico, in 1877. The porch and observatory or cupola referred to in this testimony are clearly shown in Defendants' Exhibit Photos. Kissinger Place, Nos. 3 and 5. Prior to the reconstruction of the observatory or cupola, the latter consisted merely of a railing several feet high.

Defendants' witness, Kreidler, testifies that when he and Given saw the ram at Kissinger's in 1876 this railing only was on the top of the house (Kreidler, D. S. rej. 133, Q. 31).

Bruner, who also saw the ram there in the fall of '76, testifies to the same effect (D. S. rej. 617, X. Q. 32 and 33).

David Cowens (D. S. reb. 695, Qs. 5 and 6) also refers to the reconstruction of the observatory.

William L. Taylor, besides testifying about the building of the porch and observatory in '77, says (D. S. reb. 1045) that he did other work for Mr. Kissinger in Dec., '75, Jan., '76, and March, '76, as appears from his account book (1043); and that between Dec., '75, and the work on the porch and cupola in '77, he thinks earlier than the last winter before the last-named job, he was up at Mr. Kissinger's place, and saw Kissinger boring log pipes for the ram.

George Curtis Strine, besides testifying about the work on the porch in 1877, says that prior to Nov. 19, 1877, his bill against Kissinger for porch work, remaining unpaid, amounted to about $22; that on that date (November 19, 1877,) Mr. Kissinger came to his shop and paid $3 on account (999), credit for which was given him on his book (997); that Kissinger came to pay that $3 at that time because he had been up to Kissinger's place after money shortly before that, and Kissinger had promised to pay him something in a few days; that on the occasion of his visit to Kissinger's for that money, he found him down at the barn (1000); that in going toward the barn he noticed the ram, particularly when he crossed the run; that he and Kissinger walked from the barn to the house; that he asked Kissinger when the ram was put in; his rlepy was, "It has been in since last fall."

He further testifies Kissinger said the ram was out of order; that the feed-pipes, being made of timber, didn't work well; that they leaked at the connections or had bursted; that either Mr. Draper or Mr. Drawbaugh was to send pipes there in place of those wooden pipes. That Kissinger at that time told him that the pipe leading from the ram towards the house was out of order also; that when it was put in it was second-hand pipe, and the joints didn't fit well; that it leaked at the joints (1001).

He further testifies Kissinger got down beside the ram and started it to work: that it worked "very much crip-" pled like. It worked for a short time, may be a dozen "strokes or so, and then stopped, and then in a short time "it would drive again;" that after a time they walked up towards the house, and from the discharge-pipe a stream about as large as a good-sized rye straw was running.

He further testifies that after the occasion mentioned he heard Kissinger complain in Morley's store, in the village of Marysville, that some pipes he was expecting by rail had not come at the time they should have come (1001). He knows that he saw the ram at the time he was up at Kissinger's dunning him for money a few days previous to the payment of the $3.00, from the fact that that $3.00 was the last money Kissinger paid him until he sued him and collected the balance by a judgment.

He says he brought suit against Mr. Kissinger and Mr. Draper jointly; that he got service on Mr. Draper at Marysville (1010) while he and Mr. Kissinger were coming down the street from the farm, leading two colts that Kissinger had given Mr. Draper in part payment of rent. Complainants' witness, Herman J. Eppler, testifies that the judgment against Draper and Kissinger in favor of Mr. Strine was paid by him, as Draper's agent, on March 6, 1880 (C. Vol. 3, 2265), as appears from his books (Ibid., 2260).

Geo. W. Rhoads, in addition to testifying to the work on porch and observatory at Kissinger's in 1877, testifies that in the year 1876, in the fall, he and Calvin Keim worked for Kissinger, cutting off corn; that he got his dinners at Kissinger's while working there; that the water they got for washing their hands was obtained from a barrel that set under the discharge-pipe (of the ram), near the house; that Kissinger told him at that time the water was forced up by a ram; that he did not go down to see the ram, but heard it in operation (1050).

As to the time he worked for Kissinger, cutting off corn, he is corroborated by Calvin Keim, who says that though he worked for Kissinger cutting off corn in 1876, and at no other time (D. S. reb. 733), he could not recollect who worked with him (738).

He further testifies he saw James Zimmerman, Kissinger's son-in-law, hauling iron pipes with a lumber-wagon and two horses in the year 1878, in regard to which date he is corroborated by a number of witnesses on both sides.

Another very valuable piece of evidence in support of defendants' theory of the ram is found in the testimony of Andrew J. Traver, Abraham C. Dissinger and Thos. W. Morley, three gentlemen of the highest standing in the borough of Marysville, and who, together, in the year 1876 and 1879, constituted a board of assessors, whose duty it was to make the triennial assessment of property, real and personal, within the borough of Marysville.

Dr. Traver is 58 years old; is a physician and surgeon; is the coroner of Perry Co.; was elected assessor in '76 and re-elected in '79 and '82, and has served in the council in the borough of Marysville (D. S. reb. 542).

Mr. Dissinger is 42 years old, has resided in Marysville since 1861 (558), and is a conductor on N. C. R. W. (562).

Mr. Morley is 52 years old, has resided in the section of country including the village of Marysville since 1854, long before the village of Marysville was in existence.

It appears from the depositions of these gentlemen that they were all elected at the regular spring election of 1876 to the offices of assessor and assistant assessors, respectively. Dr. Traver took the oath of office, as appears from the original oath in evidence (542), Nov. 13, 1876. Mr. Morley also took the oath of office the same day, (see orig. oath 568). The exact date when Mr. Dissinger took the oath does not appear.

The commission or mandate, directing the assessors to proceed to discharge their duty in making their first triennial assessment, is offered in evidence (D. S. reb. 544). It is dated Oct. 24, 1876, and is accompanied by printed instructions of the same date, directing how the first triennial assessment was to be made (547). Both papers direct the assessor to complete the assessment and return it to the commissioners' office on or before the 12th day of Dec., 1876, which direction Dr. Traver, the assessor, testifies was complied with (Traver 548).

Great care appears to have been observed in making this triennial assessment of 1876, because of the dissatisfaction that had arisen from the previous assessment. Dr.

Traver testifies on this point as follows: "We took particular pains in our first triennial assessment, from the fact that the previous assessments had been imperfectly made for several terms."

Again, "The previous assessments had given rise to great complaint on the part of the property-holders of our borough" (549).

And to the same effect testifies Mr. Dissinger: "Ques. 15. State briefly the reason why extraordinary care was taken in making the first triennial assessment of yours."

"Ans. For the reason that previous assessment by Mr. Schreiner and his assistants was entirely too high, and so considered by the people."

The mode they pursued was to value the property at what they believed it would bring at a forced sale, getting at such valuation, according to Dr. Traver, "by personal inspection and comparison of properties, taking for our basis what the property of its like was selling for" (549). Or, according to Mr. Dissinger, "we valued property at what we thought it would bring at a quick or forced sale; and each man would carry a slip of paper and mark down what he thought each property was worth, and if we differed we would add them up and divide by 3, and average it in that way" (559).

In carrying out this plan of personal inspection and valuation, these gentlemen testify that they together visited the Draper farm and personally inspected the same, in the fall of '76, between Oct. 24th and Dec. 12th of that year (Traver, 550; Dissinger, 559; Morley, 569).

As to what happened on the Draper farm that day, Dr. Traver testifies as follows: "He and Mr. Morley and Mr. Dissinger found Mr. Geo. W. Kissinger in the barnyard; that while they were there he, Dr. Traver, went to the spring to get a drink (551); that while at the spring the idea came to him that the water could be conveyed from the spring to the house by the use of a hydraulic ram; that when he returned to his companions he made the remark that if he owned that property he would have a hydraulic ram put in.

Mr. Kissinger said they had one in; that Mr. Dissinger then said he would like to see it work. Mr. Kissinger being asked where it was located, pointed down the rawhich date he is corroborated by a number of witnesses on both sides.

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Mr. Kissinger said they had one in; that Mr. Dissinger then said he would like to see it work. Mr. Kissinger being asked where it was located, pointed down the ravine, and said, "*Down there*," pointing towards the place, but saying further that it did not or would not work; that Mr. Dissinger then said he did not care about seeing it.

He further testifies that the place where Kissinger pointed out as the spot where the ram was situated was covered with some rubbish, such as boards, corn fodder, or other material; and that while he has since that day been at the farm-house on professional business, he has never since been beyond the house in the direction of the spring (552).

Mr. Dissinger's account of what occurred there that day is as follows: He and his companions found Mr. Kissinger at the barn, they looked at the cattle, took account of them, and asked some questions in regard to them. Dr. Traver got to talking about the water, and said they ought to get a ram to force the water up to the house; when Mr. Kissinger spoke up and said they did have one, and said it had been working, and had done first-rate, or something to that amount; that he then became inquisitive, a ram being a novelty to him; that he told Kissinger that he would like to see the ram, when the latter replied it was not in working order; after which he lost interest, and thought it was not worth while to go and see it.

He further testifies that a hydraulic ram was so much of a novelty to him that he asked Dr. Traver at that time to explain the science of it to him; and that the Dr. and Mr. Morley explained it to him.

He further testifies that he has not been on the Draper farm since 1876 for any purpose whatever, except that one Sunday he was up in the hollow at the lower end of the farm near the village, about 50 yards over the line, but not in sight of the Kissinger house or barn; and that he and Dr. Traver and Mr. Morley were never together upon the farm except upon the occasion of the assessment in 1876.

Morley, the other assistant assessor, gives the following account of what transpired: He says that he remembers being on the Draper farm that day, in company with Dr. Traver and Mr. Dissinger, making the triennial assessment; that he was never there with those gentlemen at any other time (571); that they found Mr. Kissinger at the barn; that he was working at something about the barn-yard; that they made valuation of his live stock; that the day was rather cold and blustering, and they spent some time in conversation upon the sunny side of the barn, which was toward the house. He is not able to swear positively about any conversation there at that time upon the subject of the ram; thinks the ram was there, however, at that time, but not in working order. He says that the first time he ever saw the discharge-pipe of the ram there was no water flowing from it, and he believes it was upon this occasion.

It will be observed that Morley's recollection of the conversation about the ram is not so distinct as that of Dr. Traver and that of Mr. Dissinger. He swears positively, however, that he was never on the Draper farm together with Dr. Traver and Mr. Dissinger except on the occasion of this assessment in 1876, and it consequently must have been then that the conversation that Mr. Dissinger and Dr. Traver recollect took place.

From the fact that these same gentlemen constituted the Board of Triennial Assessors in 1879 as well as in 1876, it might be suggested that it was in 1879 that the events in regard to which they testify took place, but this position is entirely untenable, and is disproved by the most positive testimony. Dr. Traver (553), Mr. Dissinger (561), and Mr. Morley (569), all testify that they did not either of them go on the Kissinger place in making the assessment in 1879. Dr. Traver (553) and Mr. Dissinger (562) say that in making this assessment of 1879 they alone took part, Mr. Morley not being able to accompany them because he was laid up with rheumatism; that they met Mr. Kissinger on the public road and got his statement (Traver, 553; Dissinger, 561); that they interrogated Mr. Kissinger about his cattle, and that was about all, and it was not necessary to ask him the value of the farm, and they knew there had been no improvements put upon it (Dissinger, 565); that they did not make as close an assessment in 1879 as they did in 1876, but just looked into improvements upon property that they had assessed in 1876; that after Kissinger's statement they went back to the village and reported to Morley what they had done (Dissinger, 562.)

Morley testifies to being laid up with rheumatism when the assessment in 1879 was made, and to Dr. Traver and Mr. Dissinger coming to him at his house and reporting that they had met Mr. Kissinger and didn't think any change in the assessment was necessary.

In further proof that it was in '76 when the conversation between the assessors about Kissinger's ram took place, and about the sickness of Mr. Morley in 1879, we have the evidence of Mr. Morley's wife, Mrs. Mary E. Morley, and of his mother-in-law, Mrs. Sarah Smith. Both of these ladies testify that while Mr. Morley was living in the house on Main street, Marysville, below the railroad, and on the occasion of the first triennial assessment made by Mr. Morley, Mr. Morley came home to dinner one day, and at the dinner-table said that he had been up to Mr. Kissinger's, and spoke of a ram that the latter had for forcing water up to the house, and he said he had not seen it operation, but he knew how it operated, and explained it to them. They also testify that they moved from the house below the railroad to the house where they and Mr. Morley at present live in the spring of 1878 (Sarah Smith, D. rej. 77; Mary E. Morley, D. S. rej. 144, 145), and that the house in which they at present live is the one which was formerly occupied by Stephen H. Morley. The latter is proved to have been sold out March 12, 1878, and to have moved away shortly after the 1st of April, 1878, to make room for his brother, Thomas W. Morley (S. H. Morley, D. reb. 1121).

Mrs. Morley also testifies that at the time of the second triennial assessment in 1879 they were living where they at present live, and that Mr. Morley was sick at that time with rheumatism; that he was only once able to walk as far as a block from the house, and that he didn't go out with Dr. Traver and Mr. Dissinger in making the assessment that year.

Another striking piece of evidence confirmatory of defendants' theory is found in the testimony of the officers and stockholders of the Chestnut Grove Cemetery Association.

It appears from the book containing the minutes of the meetings of this association that at the fifth annual meeting, held at Marysville, June 4, 1877, the subject of putting in a ram at the cemetery was brought up under the head of "new business" in the following language: "The superintendent was instructed to measure the distance from spring at the bridge near the southeast corner of cemetery, also from stream on south at *base of hill* to centre of ground, and make an estimate of the amount of probable cost to have the water conveyed into ground with an *hydraulic ram*, and report at managers' meeting in July" (D. S. reb. 928).

It also appears (927) by the minutes that the members present at this meeting were Messrs. Funk, Brabson, Dice, Swartz and Wise (927).

Defendants call Mr. John S. Funk, and he testifies that he is 63 years old, master-mechanic of the N. C. Rw. shops at Marysville, has lived at Marysville 19 years, was one of the first members of the Chestnut Grove Cemetery Association, and is president of that association now.

He testifies further that he remembers the meeting of the association on June 4, 1877, and the discussion in regard to the hydraulic ram referred to in the minutes of that date (912); that in that discussion the hydraulic ram that Mr. Kissinger had on the Draper farm was referred to; that his recollection is that some time before that meeting Mr. Kissinger had told several of the stockholders that he had a ram, and that he thought it would be a good thing for the cemetery association to also have one to force water up to the cemetery grounds, and that it was by reason of these remarks of Mr. Kissinger's that the subject was brought up at that time before the meeting of the association (912); that the subject of putting in a hydraulic ram was held under consideration by the association for about a month, but they came to the conclusion that it would be tampered with or destroyed by the boys meddling with it, so the subject was dropped.

Mr. Lewis W. Brabson, who, it will be remembered, also testifies in regard to the work upon the observatory and porch job for Mr. Kissinger in the fall of '77, testifies in this connection that he was present at the meeting of the Cemetery Association of June 4, 1877, and was at that time a stockholder and director of said association; that Mr. Wise, another stockholder, suggested that they ought to have a ram to throw the water up into the cemetery; that he thought it would be very handy for the use of the lot-holders in getting water to water flowers on the graves in the summer season, and that he then referred to the ram at Kissinger's; that part of the board objected at first that the ram at Kissinger's did not work well, but it was afterward concluded that the water did not have fall enough, that that was the trouble, and they thought if a ram was put in the cemetery it would work all right, as it had plenty of fall.

He further testifies (976) that when the subject of the ram was first suggested he opposed the project on the ground of expense, and thought they could get along without it; that, however, finally Mr. Wise was instructed to see what the cost of a ram would be, and to report at the next meeting.

He further testifies that prior to the fall of 1876 he went to Mr. Kissinger's house one Sunday, in company with Mr. Wm. Taylor, at Mr. Kissinger's invitation, for the purpose of eating some watermelons; that when they arrived there Mr. Kissinger invited them around to the kitchen, where he had some watermelons gathered in; that he took them into a room beside the kitchen, cut some watermelons, laid them on the table, and told them to help themselves; that he would have to go out, as Mr. Drawbaugh was there looking at the location of the ground with a view of putting a ram in; that Mr. Kissinger when he left them in the basement said he would have to be in a hurry, as Mr. Drawbaugh would have to be sent home (975); that he did not, however, see Mr. Drawbaugh on that occasion.

Mr. Thomas W. Morley, one of the triennial assessors, testifies (571) that he is also a stockholder of the Cemetery Association, and that while he does not know the fact from having attended any of the association's meetings, as he seldom did that, he recollects one of the stockholders telling him that there was a proposition to put a hydraulic ram in the cemetery, and it was about the time that the ram was put in on the Draper farm (591).

Francis Alonzo Givens is another strong witness for defendants (D. S. rej. 116). He testifies that he lives in Volga, Dakota, and is a telegraph operator; that he went to Marysville to live in Dec., 1875, and lived there till

Dec. 3d, 1877, when he went to Phila., thence to Texas, thence to Iowa, and thence to Dakota; that from the time he left Marysville, in Dec., 1877, he was not there again until April, 1882, when he spent a portion of a day there (119); that while he lived in Marysville he was telegraph operator for the Penn. R. R. Co., and boarded with David Geib, the station agent; that while he lived in Marysville, and he thinks in 1876 (118), and some time after harvest (125), he, in company with one George Kreidler, took a walk one Sunday, and in their walk went on the Kissinger place and saw a hydraulic ram there (118); that it was in a hole in the ground; that there was rubbish of one kind and another around it; that the ground was high around the edge of the hole and thence sloped back, and that he judged the ram was in operation, as its valve was working. He also thinks there was some boards put up to keep the hole from caving in.

Testimony of a more convincing character than that of this witness could not be produced. He could not possibly be mistaken in regard to the time when he saw the ram at Kissinger's. He was not within a thousand miles of Marysville either in '78, '79, '80, '81, and up to April, 1882, so it cannot be that he saw the ram in any of those years.

When he came back in April, 1882, he was in Marysville a portion of a day only, and Kissinger had moved away from Marysville two years before. He testifies that he did not go on the Kissinger place then; that he did not see any hydraulic ram; that he did not see or meet George Kreidler; that he hadn't seen Kreidler since he left Marysville in 1877 (120), and that he never was on the Kissinger place but the once. He was brought way in from Dakota at the time he was examined, and before going on the stand did not go to the Kissinger place to refresh his recollection, nor did he have any conversation with Kreidler or anybody else upon the subject, except when preliminarily examined by defendants' counsel.

There are but two things in his deposition which can be made the subjct of criticism. The first is, that he says he thinks the ram was in a south-westerly direction from the house, while as a matter of fact it is in a north-westerly direction. The second is, in describing the location of the ram he says (119, Ans. 26) that it was in a deep ravine that ran down between the "school-house" and the Kissinger house. In fact, no school-house was ever located at that point. But mistakes of this kind rather increase than diminish the value of his testimony, when it is borne in mind that he never was on the farm but once, and then at a period eight years prior to the giving of his testimony.

Nothing is easier than to mistake the points of the compass or to misstate the direction of one unfamiliar object from another, and his taking Kissinger's large barn for a school-house is not at all surprising. There can be no doubt that he meant the barn, for he describes the location exactly. He says that there was a deep ravine between it and the Kissinger house, and that the ram was in this ravine (119 Q. 26). Again, that the Kissinger house was on one side of the ravine and the school-house on the other (126, X. Q. 99). Again, that the Kissinger house could be seen very plainly from the school-house (126 X. Q. 96).

He probably did not mistake the school-house for the barn at the time of the visit, but while recalling the facts to memory eight years afterwards was misled by an indistinct recollection of the size of the building to which he had given no particular attention at the time.

The assessment lists for the borough of Marysville show that Given was rated as a taxable citizen of said borough in the years 1876–77; and that he was not so rated in the years 1878 to 1884 inclusive (D. S. rej. 128); and while the official list of voters who voted in 1877 at Marysville shows that he voted that year, the said list for 1878 shows that he did not vote at that time (D. S. rej. 129; C. Vol. 3, 2487). Kreidler fully corroborates him as to the fact of seeing the ram and as to the time, as we shall next see.

George W. Kreidler (D. S. rej. 129) testifies that he is a resident of Marysville, and is a tinsmith; that he went to Marysville to live Aug. 22, 1876, and has lived there continuously ever since.

One Sunday morning, between Aug. and Nov., 1876, he and Mr. Francis Alonzo Given took a pleasure walk;

they did not know where they were going, but drifted out back of Chestnut Grove Cemetery, and on the road leading over the mountain until they were opposite Mr. Kissinger's. Desiring a drink of water, they went down to Mr. Kissinger's spring and got it, and in going from the spring towards Marysville noticed the hydraulic ram. The witness describes the ram as being between 200 and 300 feet north of the house, between it and the barn, and close to the fence. It consisted of an upright pipe 2 or 3 inches in diameter, having connections at the bottom for inlet and outlet. It was in a hole in the ground, and loose stones were thrown around the hole. He cannot say positively whether it was working or not.

Witness was married April 19, 1877, and from the fact that he remembers talking to Given on that occasion about the cost of boarding and getting their washing done, he knows that it was before he was married; first, because he would hardly get his washing done outside after he was married (132); and, secondly, because after his marriage he kept more at home and seldom met Mr. Given. Inasmuch as Given (D. S. rej. 124, X. Q. 80) remembers Kreidler as being a single man, it strengthens the testimony of each of them that it was in 1876 that they saw the ram, and that of Kreidler that it was before his marriage.

Mr. Kreidler further testifies that he is certain that his visit with Given to Kissinger's was not as early as July, as he didn't go to Marysville to live till Aug. 22, '76, and it was after that (130, Q. 1; 143, X. Q. 120). While it appears that Mr. Kreidler has been on the Kissinger place several times since 1876, he swears that the first knowledge he ever obtained of Kissinger's ram was when he was there with Given in the fall of '76.

From this deposition, it will be seen that Given is corroborated in all essential particulars.

Samuel F. Trafford, another witness for defendants (D. S. rej. 72), resides at Jonestown, Lebanon Co., Pa.; and from 1872 to Oct. 26, 1878, worked for Seidel Bros. at their forge at Marysville, Pa., when he went to work for the South Mountain Iron Co., about 36 miles from Marysville, exchanging places with his brother, Thomas Trafford.

The books of Seidel Bros. prove that his last work for them was done Oct. 26, 1878 (J. Harper Seidel, D. S. rej. 68, Q. 8); and the books of the South Mountain Iron Co. show that his first work for that company was about three days in Oct., '78 (Calvin S. Edwards, D. S. reb. 70, 71).

He continued working for the South Mountain Iron Co. till some time in 1880, when he went to Port Oran, New Jersey, going thence to his home at Jonestown, where he has remained since.

While he was employed at Seidel Bros. he frequently went up to the Draper farm, where Kissinger lived, sometimes gunning, and sometimes for fruit, and saw Kissinger's hydraulic ram 10, 15 and perhaps 25 times.

He describes the ram as being in a dilapidated condition, with a kind of box around it.

He is positive that he saw the ram there in 1877, and his belief is that he also saw it there in 1876, but is not so positive about that. Shortly before this witness was examined, he went again on the Draper farm, the first time he had been there since he quit working for Seidel Bros.,in Oct., '77. He swears that the ram at this last visit stood just where it did in 1877, but instead of being boxed in as it was then, was walled in.

Amos L. Clendennin (D. S. reb. 634) testifies that he is a railroad conductor; that he resides at York, Pa., that he was married to Mollie R. Collier, of Marysville, on the 18th of Feb., 1879, and that up to the time of his marriage resided in Marysville (637); that his wife's father's name was Nathan Collier, and died in the fall of '78 at Marysville; that he paid attention to Miss Collier about four years before he married her, with an interruption between the spring of '78 and the fall of the same year, caused by some little misunderstanding between them.

During this period of interruption in his attention to Miss Collier, the witness courted Miss Susan Kissinger, who was living with her father, Geo. W. Kissinger, on the Draper farm. In the summer of 1878, upon returning home one clear, warm evening with Miss Kissinger from a colored camp-meeting held in Fenn's woods (637), Miss Kissinger requested him to go with her to the spring for a drink of fresh water; they went to the spring, and when in the act of leaving he heard a noise and asked what it was, and she said it was made by a hydraulic ram, put in to force water up to the house. The noise he heard he describes as a thumping sound, that came at intervals.

He visited Miss Kissinger at her father's house between five and eight times between the latter part of June, '78, and the last of Aug., '78 (638), and never has been at the Kissinger house nor on the Draper farm since said last mentioned date.

Enough evidence has, we think, now been pointed out to convince the court of the utter unsoundness of the complainants' theory in regard to the Kissinger ram, and, on the other hand, of the perfect harmony and consistency of the defendants' theory. We have shown by the testimony of Mr. Thos. Draper that the ram was ordered in the fall of 1874; by the testimony of the same gentleman, that the timber for the wooden piping was cut, preparatory to boring, in April, '75; by the letter of complainants' witness, Geo. W. Kissinger, dated May 30, '75, and by the admission of Kissinger respecting that letter, as testified to by Mr. Draper, Mr. W. K. Fenn and Mr. Melville Church, that as early as the date of that letter Mr. Kissinger was looking around for iron pipes for the ram; by the testimony of Mr. James Champion, Mrs. Sarah Champion, Mrs. Mary McFarland, Mr. J. M. Bruner, Mr. John Peffley, Mr. John H. Harper, Mr. Stiles L. Fesler, Mr. Joseph Gensinger, Mr. Theophilus Fenn, Mr. George W. Hayes, Mr. John H. Rhoads, Mr. Joseph W. Rhoads, and Mr. W. L. Taylor, that wooden pipes for the ram were bored during the years '75 and '76; by the testimony of W. H. Meals, that the ditches for the pipes were dug during and prior to the summer of 1876; by the testimony of Brabson, that Mr. Drawbaugh was at Kissinger's in the latter part of the summer of 1876, looking over the ground preparatory to putting the ram in; by the testimony of John Kaffenberger, that the ram was brought over from Drawbaugh's by Mr. Kissinger, between harvest and corn-cutting time in the year 1876; by the testimony of Dr. Traver, Dissinger, G. W. Rhoads, James Champion, Mrs. Champion, Peffley, Fesler, Peter Kaffenberger, Meals, Geo. W. Hayes, John H. Rhoads, Edward Crist, Brabson, G. W. Rhoads, Mrs. Sarah Smith, Mrs. Mary Morley and Joseph W. Rhoads, that it was well known in 1876 that Kissinger had a ram; by the testimony of Henry Shaffer, John S. Funk, W. L. Taylor and G. W. Rhoads, that it was also well known in 1877 that Kissinger had a ram; by the testimony of Edward L. Gault, Stiles Fesler, Wm. Hess, Peter Kaffenberger, John Kaffenberger, Calvin Ceim, Edward Crist, Samuel Trafford, F. A. Given and G. A. Kreidler, that they personally and at different times *saw* the ram in at Kissinger's, in the year 1876; by the testimony of Henry Gamber, Theo. Fenn, Edward Krist, G. C. Strine, S. H. Morley and Samuel Trafford, that they personally *saw* the ram at Kissinger's at different times in the year 1877; and by the testimony of Amos L. Clendennin, that the ram was in, and in operation, in 1878, and prior to the last of August of that year.

All of these witnesses are persons of unimpeachable character, brought from different parts of the country, and having no interest whatever in the result of the controversy, and it is to the last degree improbable—nay, in the nature of things, impossible—that all or any considerable number of them are mistaken as to the facts, dates and circumstances in regard to which they testify. The full force of their testimony cannot be gathered from the mere reference to it here given, and it is hoped that the court will have time to read each deposition from beginning to end, in order that its full force and strength may be appreciated.

Besides this overwhelming mass of oral testimony, there is record evidence tending most strongly to confirm defendants' theory that the ram was put in in the year 1876.

It appears that for the years 1874, 1875, 1876 and 1877, and up to the 1st of April, 1878, Mr. Kissinger paid, or rather contracted to pay, Mr. Draper a money-rent of $200 a year; while from the 1st of April, 1878, till the 1st of April, 1880, he paid as rent a share of the produce raised on the farm (Draper, D. S. rej. 181).

The accounts between Mr. Draper and Mr. Kissinger for the years 1874 to 1878 were kept by the former in his pocket-diary, and are spread upon record at pages 177 and 178 D. S. rej.

The account for the year beginning April 1, 1876, and ending April 1, 1877 (D. S. rej. 184, X. Q. 60), is as follows:

Apl., '76.			
125 bus. lime	$15.62	Rent	$200.00
250 bus. "	31.25		54.18
Nob and key	.31		———
	———		$145.82
Expenses of ram	$60.00	Tax pd. Simon Kreiser...	24.00
Cash	7.00		———
	———		$121.82
	$114.18		

Here we have the charge against Mr. Draper for the expenses of putting in the ram set down in the account for 1876, *just where it belongs, according to the defendants' theory*. The genuineness of the entry is not questioned. It was not put there for the purposes of this case, but for reasons perfectly satisfactory to Mr. Draper and Mr. Kissinger at the time it was done. This both Mr. Draper (Draper, D. S. rej. 185, X Q. 67) and Mr. Kissinger (C. Vol. 3, 2414, Q. 97), and even complainants' counsel (D. S. rej. 202) admit.

When was it put there? Mr. Draper is not sure whether it was put there when he was in Marysville in 1877 or when he was there in 1878 (D. S. rej. 181, Q. 48), but he inclines to the opinion that it was entered when he was there in November, 1878, and made the settlement with Mr. Kissinger (Ibid., Q. 49). Mr. Kissinger thinks it was done in 1878 (C. Vol. 3, 2413, Q. 93).

It is very evident from an inspection of the book itself. that the entry originally stood as follows:

Apl., '76.			
125 bus. lime	$15.62	Rent	$200.00
250 bus. "	31.25		
Nob and key	.31		
	———		

Then the $7 entry was evidently made on the left side of the account, and both sides of the account were added up, and one footing substracted from the other, thus:

Apl., '76.			
125 bus. lime	$15.62	Rent	$200.00
250 bus. "	31.25		54.18
Nob and key	.31		
			$145.82
Cash	$7.		
	$54.18		

Afterwards the footing, $54.18, of the left-hand side of the account was rubbed out; the item "Expenses of Ram, $60.00," entered on that side of the column and again footed up, while on the other side of the account the item "Tax pd. Simon Kreiser, $24.00," was entered and deducted from the previous footing of that side, leaving the account just as it now stands.

Now what is Mr. Draper's explanation?

He says the items of the account were presented to him by Mr. Kissinger in the form of bills, and that he entered them in his diary as they were presented (D. S. rej. 181, Q. 48); that Mr. Kissinger did not bring in all his accounts at once, but would bring in first one of them and then another, and his recollection is that after the account in the diary was first made out, Mr. Kissinger came in and said he had forgotten about the cash item of $7, the item of $60 for the expenses of the ram, and the tax item of $24; and that all these items were then put down. No payment of money was made by Mr. Kissinger at the time, and so the matter was left (Draper D. S. rej. 185, X Q. 64). There cannot be the slightest doubt but that the charge for the ram was placed on the 1876 account because it belonged there. In the absence of any satisfactory explanation to the contrary, the fact of its being there conclusively proves that it was meant to be there, but not a shadow of doubt is left in the mind that it was intentionally and rightly placed there when we come to consider the character of the other items that were in like manner added to the account after it had first been drawn up, namely: the cash item of $7 and the tax item of $24. The first of these we recognize as the credit for the seven dollars which Mr. Kissinger paid Mr. Draper Feb. 22, 1877, as testified to by both Draper and Kissinger (Draper, D. S. rej. 175, Q. 41). (Kissinger, C. Vol. 3, 2421, X Q. 158; ibid. 2423.)

But why was not this item put into the 1877 account?

Simply because the 1876 account extended from Apl. 1, 1876, to Apl. 1, 1877, and this payment happening in Feb., 1877, fell within the 1876 account (D. S. rej. 184, X Q. 60). It was entered there because it was properly an item of that year's account, and belonged there.

Then as to the tax item: The original tax receipt is put in evidence, and is dated Dec. 18, 1877 (D. S. rej. 187). Why also should this not go into the 1877 account? The reason is plain. The explanation is found on the face of the receipt. It purports to be payment in full for the county tax *for the year* 1876! It is not included in the account for 1877 because it does not belong there, no more than the cash item for $7 and the ram item for $60 belong there.

There is no escape from such evidence as this. It speaks volumes. Though it were rebutted by a dozen witnesses it would still have great force, and could not be easily explained away.

The complainants early saw this, but realized they must make an attempt of some kind. As usual, when in a tight place, they called upon Kissinger, and this is the way he did it. That any weight may not be lost we quote what he says (C. Vol. 3, 2413):

"Q. 93. There is an entry in this account book, 'Ex-
"penses of ram, 60'; do you remember whether he made
"that entry at Marysville in the fall of 1878, or whether
"it had been made before?

"A. If I am right, it was made in the fall of 1878.

"Q. 94. When you and he settled at that time, do
"you remember how much was found due from you to
"him for balance of the last year's rent?

"A. Yes, sir, or very near it.

"Q. 95. About how much?

"A. Fifty some dollars.

"Q. 96. In this book the sixty dollars for the ram does
"not now appear deducted from the balance of that last
"year's rent, but was written into the previous year; do
"you remember why that was done?

"A. *I suppose because he couldn't take sixty dollars off*
"*of fifty odd dollars, and it was set back on that account.*"

We venture to say a more imbecile effort to explain away a damaging piece of evidence was never made than this. In the first place, there is not a word of truth in Mr. Kissinger's statement that the balance due from him to Mr. Draper for the year 1877 was only "fifty some dollars." Mr. Draper's book shows that balance to have been $155.41. But suppose the balance had been only "fifty some dollars," there was no necessity nor propriety in getting the ram charge back into the wrong year by reason of that merely; for while it is undoubtedly true, as Kissinger says, that "he couldn't take sixty dollars off of fifty odd dollars," it is equally true that fifty odd dollars might, by a very simple process, have been taken from sixty dollars and the balance noted, without violating the account of another year. This, however, doesn't seem to have occurred to the active mind of Mr. Kissinger.

But what business did a charge for a ram have even in an account for 1877, if the complainants' theory is correct? They contend that the ram was not procured till November, 1878. If that was so, it could not be charged into the 1877 account, because that ended April 1, 1878.

The whole fabric of the attempted explanation thus goes under, and leaves the important testimony of the book only the stronger.

In addition to all the foregoing evidence offered by defendants in support of their theory, there yet remains to be considered the testimony of a number of other witnesses, who were first called by defendants, but who, subsequently, after being worked upon by the agents of complainants in the most disgraceful manner, were recalled by the complainants for the purpose of getting them to retract or modify their previous testimony.

While we believe that the whole testimony of these recalled witnesses, notwithstanding the strenuous efforts of complainants' agents to persuade them out of their memories and recollections, still strongly supports defendants' theory, we have thought best in this brief to separately treat them.

The first of them to be considered are those who gave testimony for defendants in regard to the borrowing of the auger by Kissinger for use in boring his log pipes, namely, Emanuel Keller, Peter J. Heisley, Christian I. Heisley, Joseph S. Heisley.

Kissinger and his son Cyrus, in their original depositions, both referred to the fact that the auger which they used in boring their pipes was borrowed of Emanuel Keller.

Keller was called by defendants (D. S. reb. 619), and testified that Kissinger came to him, he could not say when, and asked him to lend his auger. He told Kissinger he might have it, but that it was at Peter Heisley's; that subsequently he, Keller, got the auger from Heisley's and gave it to Kissinger.

He further testifies that the Heisleys had the auger twice, and it was after the second time they had it that Kissinger borrowed it.

The witness's statement in regard to these facts is corroborated by his son, David A. Keller (D. S. reb. 620.)

When recalled by complainants, Keller testified, in substance (C. Vol. 3, 2382), that he thought, though was not positive, that Kissinger borrowed the auger of him in the fall of '77, and his reason for thinking so was because complainants' agent, Brooks, and Mr. Kissinger and Squire Foulk's son-in-law, Wallace, had, shortly before his examination, told him so.

To corroborate the Kellers the defendants called Peter J., Christian I., and Joseph F. Heisley.

All three of these persons testified that log pipes, for carrying water from the spring to the spring-house, were bored on their father's farm in Rye township on two separate occasions—once when the pipes were first put in, and once when some new sections were made to replace a number of old ones that leaked and had become worthless. Peter said the first boring was in 1874, and that the auger used was obtained from Mr. Dice (D. S. reb. 627, Q. 13). All three testified that the auger used at the second boring was obtained from Mr. Keller, and Peter said that he personally went to Keller's for it; and that it was given him by Mrs. Keller, after some difficulty expeienced in finding the bit (678, Q. 25).

Peter said the second boring took place in the spring of '75; that he was sure of the date, because it was the spring after the pipes were first put in (629, Q. 23).

Christian said he knew the second boring was in the spring of '75, from the fact that when he came home, in September, '74, complaint was made that the pipes did not carry the water properly, and they tried to fix them by pitching them: but that not answering, in the following spring new pipes were bored and put in (667, Q. 47).

Joseph also testified to the efforts to repair the old pipes with pitch and tow before the second pipes were bored (681, Q. 26), and said that both borings took place beween the beginning of '74 and the beginning of '76. Peter and Joseph both testified that the auger was kept but a short time on the occasion of the second boring while Christian was more definite, and said that they had the auger at that time but two weeks (667, Q. 49).

Both Christian and Joseph testified, positively, that while they had the auger the second time, Mr. Kissinger came to them and wanted to borrow the auger to bore some pipes for himself. Joseph testified that he told him the auger was Keller's, and directed him to one of the family (682, Q. 36), while Christian said that Kissinger came to him, and he told him they were through with the auger, but that it belonged to Mr. Keller, and that the latter's permission would have to be obtained before he, Kissinger, could take it (667, Q. 49).

All these Heisley boys were subsequently recalled by complainants, and said they believed they had made a mistake in stating in their former testimony that the second boring of their pipes was in 1875; that while it was their recollection and belief, when they first gave their testimony, that such second boring was in '75, the finding of a reamer, which was used in reaming the pipes at the second boring, and which the books of the blacksmith, W. C. Patterson, who made it, showed to have been made in the spring of '76, had influenced them to believe that the second boring was in 1876.

Patterson was then called to the stand, the reamer was produced, and also the book containing the alleged charge for making it. The entry is as follows (C. Vol. 3, 1748):

P. Heisley, 1876.

Mc 22, fixing boring machine........	.35
Making bit........................	.10

It is quite possible that Mr. Patterson did, at some period of time, make a reamer for old Philip Heisley. The testimony of Peter, Christian and Joseph Heisley, on their recall, of their mother, Margaret Heisley, and of their brothers, Charles, William and Philip, would seem to establish this; but as to the precise date when that reamer was made dependence has to be placed solely upon Patterson and the entry in his book, inasmuch as old Philip Heisley, against whom the charge for the reamer was made, and who, Patterson testifies, personally brought him the reamer job, is dead, and unable to offer any contradictory evidence.

The book itself appears to have been kept in a very slovenly manner, successive accounts appearing to be dated 1872, 1874, 1872 again, and so on, in irregular order.

Moreover, the book is very much mutilated, a large number of leaves having been torn out, and the stubs remaining bearing evidence of writing upon them. In one instance, between two remaining pages dated 1875, a number of leaves have been torn out. In fact, the whole appearance of the book is suspicious. It is especially significant that pages evidently bearing 1875 accounts should be missing, in view of the fact that Patterson seems to have at some time made a reamer for old Mr. Heisley, and the entry of 1876, above quoted, relied upon to show the making of the reamer in that year, does not contain a charge for making a *reamer* at all, but a charge for making a *bit*—quite a different thing. Defendants' theory about this entry is that at some time in '76 old Mr. Heisley got Patterson to made a bit for an ordinary boring-brace, such as most every farmer has, and this view is strengthened from two circumstances: first, from the fact that the accompanying charge is 35 cents for fixing a boring-machine, which would describe quite accurately such an implement; and, secondly, from the exceedingly small amount charged for making the bit, viz: ten cents. The reamer put in evidence is scarcely a thing that could be made for ten cents.

Patterson's testimony in regard to how it was made is substantially as follows: He says that old Mr. Heisley brought to his forge a piece of saw-blade about six inches long, having a number of teeth upon it; that he (Patterson) heated this piece of saw-blade to a red heat, and then, after first scratching off the shape he desired to cut it into, dotted it with a center punch, then reheated it and cut it off with a chisel and sledge, following the marks previously made. Two sides, and perhaps one end of the piece of steel, were thus cut off. The edges were then sharpened by hammering on the anvil and afterwards by filing, while held in a vise; the blade was bent, the iron shank was made; the blade and shank were punched; the holes in the blade were counter-sunk; the rivets made and inserted and headed-up on the anvil with a riveting hammer, after which the shank was heated again and inserted in the wooden handle. All this work, which must have taken considerable time and labor, for ten cents! A charge so small for such a piece of work seems incredible.

It may be that it was when the Heisleys *first* bored the logs that Patterson made the reamer. The evidence shows that when the logs were first put in they were reamed out by P. H. Heisley (C. Vol. 3, 1866), and Patterson does not undertake to testify positively that he never did any work on any bit or boring-machine for Mr. Heisley prior to March 22, 1876, the date of the entry in controversy, but he don't remember to have done so.

But let it be assumed for the purposes of argument that the three Heisley boys were wrong in their original testimony when they stated that they bored their second pipes in 1875, and that as a matter of fact the second boring took place in 1876, and that the reamer was made and used at that second boring; can any advantage result to the complainants, and is not the defendants' theory still supported? Christian Heisley and Joseph Heisley, as we have seen, testified positively in their original depositions that while they had the auger the second time Kissinger came to them to borrow it, and they told him it was Keller's, and that the latter must be seen about it. According to this, Kissinger was trying to borrow an auger in '76, nearly two years before the complainants contend any boring was done by him, and at least 18 months before they contend Kissinger's ram was ordered and there was any occasion for his inquiry for an auger. In his second deposition, to be sure, complainants got Christian Heisley to say that he was not certain about Kissinger's inquiring for the auger while it was there at his place the second time (C. Vol. 3, 1794, Q. 14), but he nevertheless admits that Kissinger did, at some time, inquire for the augur. His brother Joseph, in his second deposition, makes no variation from his original testimony in this respect, and it stands by him proved, aided by Christian's clear recollection of the fact, but not of the exact time that Kissinger did, as early as 1876, make inquiry of them for the auger.

That he made such an inquiry in 1876 does not overcome the positive testimony of defendants' witnesses that he was boring in 1875; and, indeed, from the fact that it appears from complainants' testimony that Kissinger himself borrowed Keller's auger on one occasion, and that Cyrus Kissinger borrowed it on another occasion (C. Vol. 1, 573, X. Q. 215), it is consistent with defendants' theory to suppose that Cyrus borrowed it first in 1875, and that afterwards, in 1876, Kissinger himself borrowed it.

David Cowen is another recalled witness. He testified in the first place for defendants (D. S. reb. 695), that he resided in the borough of Marysville, on a farm next but one to the Draper farm; that he had lived there forty-one years; that in the years 1875 and 1876, Mr. Leonard Swartz farmed his farm; that in the spring of 1875, while Swartz farmed for him, he concluded to put in wooden pipes to convey water from his spring to his milk-house; that hearing that Kissinger was at that time having some pipes bored on his place, he went down to Kissinger's to see them; that he found that Kissinger had drawn together some logs out of the woods, and was boring them with a pipe auger, which he said he had gotten from Mr. Keller, and which he said witness could get to bore his pipes with; that he, witness, went back home, and finding no proper timber on his own land to bore for piping, concluded to make pipes out of boards; that he procured material for his board pipes and made them; that he got a man named Webb to dig the ditch, and that he put the pipes in, all in the spring of '75. He testified further that it was in the fore part of March, 1875, before he put in his own pipes, that he saw Kissinger boring logs, and he produced a book containing an account of Webb's work on the ditching, showing such work to have been done in May, 1875 (ibid., 699).

He further said that at the time he put in his own pipes Leonard Swartz was plowing for corn in the field through which the pipe ran, and that Swartz opened the ditch for him with the plow; and that David Webb completed the ditch (697, Q. 19). Swartz corroborates him in this (Ibid. 684); and so also does David Webb (Ibid. 711).

He further testified that in the spring of 1876 he and Kissinger went down to Milltown to see Drawbaugh about putting in the ram; that Kissinger told him Drawbaugh had promised to come up and put the ram in, but he hadn't come, and he wanted to go down and see when he would come (Ibid. 702); that when they got to Drawbaugh's shop, the latter said he would try to bring the ram up as soon as he could; that he was busy, and had some little fixing to do to it yet (Ibid. 702); that he formed the opinion at the time that Drawbaugh didn't care much whether he furnished the ram or not, as he was afraid he would not get paid for it, Kissinger being so slow in paying (Ibid. 702).

He further testified that he knew this visit to Drawbaugh's shop was in 1876, because Drawbaugh at that time showed them both his talking machine and his large electric clock, and said he was going to get the latter ready to take down to the Centennial Exposition in the fall (704); further, that he never was at Drawbaugh's shop except on the occasion of his visit to it with Kissinger (Ibid, 701). He said that the first time he saw the ram in at Kissinger's, working, he thought was in the fall of 1876, though he was not certain about it (704).

Between the time of giving this testimony and the time of his recall by complainants, the agents of the latter had gone to witness and so worked upon him by arguments and misrepresentations of the testimony of other witnesses examined on behalf of complainants as to actually lead him to doubt whether it was at the time when he first put in his own pipe or at the time when he opened those pipes to clean them out, that he saw Kissinger boring pipes.

After getting him in this frame of mind they put him on the stand, and he testified that after he put in his board pipes in 1875, *and he supposed* a couple of years after, roots grew into them and choked them so as to prevent the free flow of water (C. Vol. 3, 2149), and that he opened up the pipes and took out the roots; and that he thought it must have been that the idea of putting in log pipes occurred to him at that time, and that it was then that he went to see Kissinger and found him boring pipes. But his cross-examination shows that the idea of associating the taking out of the roots from his pipes with the boring of the pipes by Kissinger was suggested to him bodily by complainants' agents, and was not the result of his own reflections and recollection at all (Ibid., 2157, X. Q. 89), and the fact that he was right in his first testimony was conspicuously developed by questions bearing upon the time of the year when he opened his pipes, and the time of the year when he saw Kissinger boring.

He was asked when it was that he opened his pipes to take out the roots, and he stated that it was *soon after harvest, after the wheat was cut* (2167, X. Q. 187; 2168, X. Q. 190), and he was also asked what time of year it was when he saw Kissinger boring pipes, and he replied that *it was early in the spring* (2167, X. Q. 188), giving the same answer that he had given in reply to a similar question in his first deposition when called by defendants (D. S. reb. 697, Q. 16; Ibid, 705, X. Q. 70.)

It was evident from these answers on recall that his unbiased recollection was that the cleaning of his pipes and the boring of Kissinger's pipes were in no way associated with one another, and took place on two separate and entirely different occasions, and when this was brought to his attention, his eyes were opened to the fact, and he admitted it (C. Vol. 3, 2168, X. Q. 191.)

On his recall, the complainants also got him to say that he thought the first time he saw Kissinger's ram Wagner was stoning up the pit.

In his first deposition for defendants he did not undertake to say positively when it was he first saw Kissinger's ram in operation, nor did he attempt to positively fix the time, and it may be that Wagner was stoning up the pit when he first saw it, though it is more than likely that the idea of Wagner's being there was also put into his head by complainants' agents, who seemed to have scrupled at nothing, since it appears they had the assurance to tell him that Wagner had testified that Kissinger's ram was put in in 1878 (2154, X. Q. 57; 2156, X. Q. 54), when in point of fact Wagner had testified to no such thing, but only that he had put a wall around the ram in 1878, and that the ram was in and in operation at the time he did it (Wagner, C. Vol. 2, 1259, X. Q. 27.)

It is confidently believed that the careful reading of both of Mr. Cowen's depositions will convince the court that when he gave the first one he testified according to his own independent recollection and belief, and that the uncertainty found in his second deposition is merely the result of the subtle arguments of complainants' agents, made with a view to mislead and deceive him. It will be noticed that no attempt is made to explain away the witness' visit with Kissinger to Drawbaugh's shop for the purpose of hurrying up the latter about the ram. That visit was so indelibly fixed in the witness' mind as being before the Centennial Exposition that he could not be persuaded that he was wrong in regard to it. The fact that he did make such a visit to Milltown is admitted by even Kissinger himself (C. Vol. 3, 2417), though the latter doesn't recollect going to Drawbaugh's shop on that occasion.

Considered by themselves, the two depositions of this witness tend strongly to strengthen defendants' theory, but taken in connection with the testimony of other of defendants' witnesses who swear substantially to the same facts, their force is greatly increased.

Leonard Swartz is another recalled witness. In his original deposition given for defendants (D. S. reb. 682) he testified that in the years 1875-76 he farmed Mr. David Cowen's farm; that during the year 1875, while he was plowing for corn-planting on said farm, Mr. Cowen put down some pipes between his spring and milk-house; that these pipes ran through the field that he, Swartz, was plowing at that time, and that Mr. David Webb dug the ditch in which these pipes were placed. In all this he is corroborated by David Cowen, John W. Cowen, David Webb and W. H. Swartz.

He further testified that he first heard of Mr. Kissinger's boring pipes about the time Mr. Cowen's pipes were put in; that Mr. Cowen went down to Kissinger's to see the latter's pipe, but concluded not to adopt pipe like them, but instead to employ square pipes, made of boards nailed together; that he got pipes such as last described, and laid them.

He didn't pretend to know when Kissinger's ram was put in, but was sure that the boring of the pipes took place at Kissinger's as early as the spring of '75, when Cowen's pipes were put in (Ibid. 687, Q. 60).

On his recall by complainants (C. Vol. 3, 2298), he admitted that complainants had sent Mr. Cowen and Mr. Kissinger to convince him that he was wrong about the date of the boring at Kissinger's, and that complainants' agents and counsel had also been arguing the case to him, showing him parts of the testimony most likely to influence him to change his former testimony. He also confessed that his independent recollection and belief at the time he first testified was that Kissinger's pipes were bored in 1875, but said he had been so far shaken by the arguments and evidence that complainants' agents had laid before him as to think he must have been mistaken.

Of course his original testimony was valuable only in so far as it embodied his own independent recollection of events and dates, uninfluenced by outside considerations, and his new testimony founded upon what complainants' agents had told him, was not his testimony, but theirs. His recall, indeed, does far more injury to complainants than defendants, since it exhibits to the court another example of their abominable methods in persuading and influencing witnesses.

John W. Cowen, another recalled witness, testified originally for defendants (D.-S. reb. 714), that he was the son of David Cowen; that Mr. Leonard Swartz farmed his father's farm during 1875 and '76; that prior to Mr. Swartz taking the farm his father had a sale of his stock, and sold all of his horses, except one, a young bay mare, which he retained; that in the month of September, 1876, he plowed two days and a half for Mr. Kissinger on the Draper farm, preparatory to sowing a wheat crop; that the team he used at that job of plowing consisted of his father's horse and one of Mr. Kissinger's horses; that while he was working there at that job he got his meals at Mr. Kissinger's house, and watered his horses below the spring-house; that one day when he was coming up to dinner he saw wooden pipes lying along a ditch, between the spring and the present location of the ram, which pipes were partly covered at the point where he took the horses to water (716); that Mr. Kissinger was fixing the pipe, assisted by old Mr. Meals, now dead.

He further testified that in the same fall, after that job of plowing, and some time in November, he visited the Centennial Exposition at Philadelphia, and that afterwards, and within a week of his return, he went on Kissinger's place to get a shovel which Kissinger had borrowed, and that he saw water running out of an iron pipe up near the house; that this pipe stood about 2 or 3 feet above the ground, and was curved over (718).

He also testified that in the fall of 1878 he saw Mr. Zimmerman, Kissinger's son-in-law, hauling, with a two-horse team and a large wagon, a lot of new iron pipe from the Marysville station, and that he afterwards learned that the new pipe was procured because the old ones had bursted.

This witness was positive in his testimony, and his whole first deposition shows that his memory is good, and that the circumstances about which he testified were fresh in his mind.

When it became apparent to defendants' counsel that complainants' agents were using every means in their power to get defendants' witnesses to come in and change or modify their testimony, or to at least express a doubt about its correctness, they sent for this witness, and upon examining him found that he had been approached on a number of occasions by Mr. Brooks and Mr. Beers, and that he had withstood all their arguments, and refused to give for them testimony different from that given in his first deposition; but, on the contrary, insisted that his first deposition was correct. Nevertheless, it appears that only a day or two after this interview with defendants' counsel, complainants' agents secured him, and got him to come in and testify as follows.

We give the only question put to him on the subject, and his answer thereto:

"Q. 5. In your former deposition you testified that you saw wooden pipes for the ram, and also saw the water running out of an iron pipe near the house on Mr. Kissinger's place, and you testified that you saw these things there in 1876; will you state now whether it was in 1876 or not that you saw those things there?

"A. I was positive at the time that it was in 1876, but since I have changed my mind; having conversation with others about the same thing, I found that I had made a mistake."

From this it appears that as the result of complainants' agents' arguments, or from some more reprehensible procedure on their part, he had been at last persuaded to come in and express a doubt about his former testimony.

No new or different recollection appears to have influenced him, but he admits to have been controlled merely by what others had told him since first testifying.

Eli W. Wise, another recalled witness, testified originally for defendants (D. S. reb. 926) that he was a member of the Chestnut Grove Cemetery Association, and had been secretary of the association since 1872. He testified to being present at the meeting of the association, when the subject of putting in a hydraulic ram at the cemetery was discussed; said that at that meeting he was instructed to get an estimate of the cost of putting in a ram; and that some time in the July following Mr. Drawbaugh came over and went up to the cemetery with him, and made an estimate.

He further testified that he did not specially get Mr. Drawbaugh to come up to Marysville to make the estimate, but that the latter happened to be there on business with Mr. Kissinger concerning a hydraulic ram which the latter had; and that at that time Drawbaugh left with the witness a bill for $19.80 against Kissinger, growing out of the ram matter, which he, witness, tried to collect, but failed.

He further testified that the fact that there was then a ram on the Draper farm was instrumental in causing the subject of procuring a ram for the cemetery to be brought up at that particular meeting of the association, June 4, 1877; that prior to said meeting, and he thought about May, 1877, he was on the Draper farm and saw the ram, that it was boxed over with boards, and, so far as he recollected, there were stones placed about it very ruggedly.

On his recall he testified that Mr. Brooks and Mr. Beers had been to see him, and had laid before him the evidence of Wagner and others of complainants' witnesses, and he testified that since Wagner's book showed the ram to have been walled in '78, it appeared to him that there could have been no wall about it in '77 (C. Vol. 3, 2330); and that while his recollection was that Drawbaugh went with him to the cemetery in the summer of '77 to make the estimate, and also that he did on some occasion leave a bill against Kissinger concerning the ram, yet it appeared to him that the bill could not have been handed him in '77, because the ram was shown by Wagner to have been walled up at a subsequent date. In other words, in response to complainants' agents' arguments, he concluded that because the ram appeared to have been walled by Wagner in '78, it could not by any possibility have been in without a wall, or with another and different wall, or protection, before that time.

But here again it is apparent that, so far as the witness has any personal recollection on the subject, it accords precisely with his first testimony for defendants, and his statement of his alleged mistake is simply a repetition of complainants' arguments, and not his own testimony at all.

If the court should find him to be in any real doubt about the date there is other evidence to show he is correct, for both Brabson (D. S. reb. 973) and Funk (Ibid. 911) testify that they were present with Wise at the meeting of the Cemetery Association on June 4, 1877, when the Kissinger ram was under discussion, and the minutes of the association of that date show conclusively that all of them were present at that time (Ibid. 927).

The effort on the part of the complainants' agents to induce Abraham C. Dissinger, one of the three assessors who made the triennial assessment at the Kissinger place in '76, to change his testimony was even more abortive.

The most they could get him to say was (C. Vol. 3, p. 2346), that while his impression was that he was on the Draper farm on the occasion of the assessment of '76, and had the conversation about the ram at that time, he would not say positively that it was at that time, because he had been assessor two terms. But since, in his first deposition, he testified that he never was on the Draper farm together with Mr. Morley and Dr. Traver, except on the occasion of the assessment in '76, and that Morley was sick and unable to take part in the assessment in '79, and since Mr. Morley and Dr. Traver both testify to the same effect, there cannot be the slightest doubt that the conversation which he remembers having had with Kissinger about the ram occurred in 1876 and not in 1879.

The extraordinary and unprofessional conduct of complainants' counsel in permitting their hired agents to thus go around and persuade defendants' witnesses to change their testimony, not by reason of any new facts within the witness' own memory, but by arguing to them the case upon the testimony of other witnesses upon whom they had been similarly working, and then trying to influence them by the conduct of such other witnesses, is, to say the least, highly discreditable to them, and, we think, will not be passed over by the court without censure.

Those witnesses who were actually recalled were by no means the only ones they endeavored to influence, but only those with whom they had any success. The assessors, Dr. Traver and Mr. Morley, and the log-pipe witness, John H. Harper, were so vigorously pressed—though without the slightest result—that defendants deemed it their duty to put them again on the stand for the purpose of further exposing to the court the complainants' methods.

Their depositions will be found at pages 152, 211, and 237, respectively, of defendants' testimony in sur-rejoinder.

While Mr. Harper was standing firm against their persuasions the argument was advanced by complainants' agents that he had nothing at stake and they had, but his reply, "that nothing but his principle was involved," was a fitting rebuke, and appears to have silenced them (D. S. rej. 239).

THE EVIDENCE OFFERED BY COMPLAINANTS IN SUPPORT OF THEIR THEORY

We will now turn to the evidence offered by complainants in support of their position in regard to the putting in of the ram, and as we proceed, request the court to note how effectually the most material parts of it harmonize with and fill out and complete the theory of defendants.

First, we have Mr. George W. Kissinger again. He evidently has no sort of an idea when the ram was ordered; let us see what he knows about its being delivered and put in, and about the preparations for it.

He testifies that, between the spring and the ram, wooden pipe was used, with the exception of two joints of iron pipe, which were next the ram to keep it from bursting (575, X. Q. 204); that the pipe between the ram and the house was all iron pipe (Ibid., 205); that the logs used for the wooden pipes were obtained on the farm, and that he bored them himself, assisted by his boys; that the boring was commenced *early in the spring, after he had been to Drawbaugh's with Draper;* in other words, according to complainants' theory, in the spring of '78 (553, Q. 17). He cannot say which of his boys helped him to bore (553, Q. 15).

His son, George Franklin, gives no testimony about the boring, but his sons, John and Cyrus, and his son-in-law, Zimmerman, all contradict him, the two former most flatly. John testifies that when he came from Chicago, about December 20, 1877, they were already at work boring the logs; that he helped finish them, and that they were all bored when he left, May 27, 1878 (C. Vol. 1, 575). Cyrus says that the wooden pipes were bored, put in the ground, and covered up in the fall of '77 (C. Vol. 2, 1478); and Zimmerman testifies that they commenced boring in 1877 (C. Vol 1, 651, X. Q. 307), but he cannot say whether before the 1st of September, 1877, or not (Ibid).

Notwithstanding these contradictions of him as to the year the boring was done, Mr. Kissinger's statement that he commenced boring the pipe for the ram in *the spring of the year after his visit to Drawbaugh's* has some significance, since it corroborates a number of defendants' witnesses who saw him boring in the spring of '75, which was the first spring after Draper swears the ram was ordered.

Another point in Mr. Kissinger's testimony deserves notice. He testifies that the auger with which the logs were bored for the wooden piping was obtained from Mr. Keller (572, X. Q. 211); that he personally went to Keller's for it, and asked him what he would charge for the use of it; that Keller replied that he didn't know, and thought that it ought to be worth a dollar; that he took the auger, used it, and took it back; that he never paid Keller; and that the latter has said nothing about it to him since (573, X. Q. 215). Cyrus contradicts himself flatly on this point by testifying, with equal particularity, that he himself got the auger from Keller's; that Mr. Keller and one of his boys were there when he got it (C. Vol. 2, 264, X. Q. 264); and he details the conversation which he says took place (Ibid., 1508). Either one or the other testifies falsely, or the auger was obtained from Keller's twice, viz.: once for boring the logs in the spring of 1875, as testified to by defendants' witnesses, and again at some subsequent period for boring more logs. Support to the latter view is found in the testimony of the Heisley boys, Christian and Joseph.

The next point in Mr. Kissinger's testimony deserving notice is what he says in regard to the bringing of the ram from Drawbaugh's shop. He says that he himself brought it over in a wagon (555, Q. 27), and that he brought along with it some pieces of pipe. But here again Cyrus contradicts him squarely by testifying that he himself brought the ram and some tools, but no pipe, from Drawbaugh's shop, in his father's wagon, and stopped at his father-in-law's to get his horse fed (C. Vol. 2, 1470), and his father-in-law and his mother-in-law, Mr. and Mrs. Boyer, testify that they remember of his stopping at their house, and seeing the ram and some tools in his wagon, and that Cyrus told them he had gotten them from Drawbaugh's (Mr. Boyer, Vol. 2, 1547; Mrs. Boyer, Ibid, 1542-3). Cyrus says that it was some time after Oct. 22, 1878, that he brought the ram and tools over (C. Vol. 2, 1470).

Either Mr. Kissinger or Cyrus is wrong, or both are right, and the ram was brought from Drawbaugh's on two separate occasions. If the ram was brought over but once, and Cyrus is right and Mr. Kissinger is wrong, then we have another proof of the latter's want of memory and utter unreliability. But if, on the other hand, Mr. Kissinger is right and Cyrus is wrong, the value of Cyrus' testimony on other points is destroyed. It is more than likely, however, that both of them are right, as in the case of the auger. We know that Mr. Kissinger brought the ram over once in the fall of '76, between harvest and corn-cutting time, because John Kaffenberger saw him bringing it (John Kaffenberger, D. S. reb. 953, Q. 16). And the probability is that when, in the fall of '78, the new iron pipes were purchased and the new wall built in the ram-pit by Jesse Wagner, the ram was sent to Drawbaugh's and brought back by Cyrus after being cleaned and fixed.

Zimmerman also thinks Mr. Kissinger, and not Cyrus, brought the ram over when it was brought (C. Vol. 1, p. 650, X. Q. 292).

A most transparent attempt was made by complainants in their closing testimony to straighten out and reconcile these conflicting and contradictory statements of Mr. Kissinger and his son Cyrus, in respect to getting of the auger from Keller and the bringing of the ram from Drawbaugh's shop. They recalled Mr. Kissinger, and got him to admit that he was wrong about having brought the ram, and to say that it was Cyrus who brought it, and that he brought something else, viz: Drawbaugh's tools (C. Vol. 3, 2408, Q. 43); and, on the other hand, to say that Cyrus was wrong about getting the auger from Keller, and that it was he, Kissinger, who got it.

They had evidently waked up to the fact that the auger and the ram had been making too many trips to suit their theory, and they called in this old man, whose recollection about everything is almost *nil*, but who would swear to anything for them, with the idea of trying, at least, to shade off the damaging effect of the original testimony. But they forgot their man, and overdid it, for Kissinger, while letting himself down in taking back his former testimony about bringing the ram, said it was *Drawbaugh's tools* and not the ram that he brought. Now it so happens that Cyrus in his testimony swears that when he brought the ram *he also brought the tools* (Cyrus, C. Vol. 2, 1471, Q. 80); and Mrs. Boyer, his mother-in-law, testifies that she saw both the ram and the tools in Cyrus' wagon (C. Vol. 2, 1543, Q. 17) when the latter stopped at her house on his way back from Drawbaugh's. So, notwithstanding Mr. Kissinger's assertion that he brought Drawbaugh's tools and not the ram, it stands proved that Cyrus also brought the tools, and defendants' position that the ram, as well as the tools, was brought over from Drawbaugh's shop on two distinct and separate occasions, is thereby materially strengthened.

In his first deposition, Mr. Kissinger does not undertake to say just when the ram was put in. All that he says is, that it was put in the year after he and Draper were at Drawbaugh's shop; adding this qualification, however: "As near as I can recollect, if my mind carries me right" (574, Q. 227).

John says he never saw the ram (C. Vol. 1, 576); George Franklin thinks that the ram came after the new pipe was delivered, in Sept., 1878 (C. Vol. 1, 582); and Cyrus says that the ram was put in, he thinks, in the fall of '78, just prior to the visit of Mr. Draper in that fall.

Zimmerman, the son-in-law, gives more particulars. He says that Mr. Drawbaugh came over for the purpose of putting in the ram Monday, Nov. 4, 1878; that on the morning of the following day, which was election-day (Nov. 5, 1878), he voted early at Marysville, and then took his wife and children over to visit relations at Landisburg; that before they left, Mr. Drawbaugh was there getting the iron pipe ready to put in (C. Vol. 1, 645); that he came home on the following Monday; and that the ram was then in and running (658).

The gist of the testimony given by all the members of the Kissinger family is, that there was no hydraulic ram on the Draper farm prior to the fall of 1878, and no preparations made for a ram prior to the fall of 1877; but in view of the overwhelming mass of positive evidence to the contrary of this, the conclusion is inevitable that they are all certainly wrong, and have either wilfully perjured themselves, or else have been argued into the proper frame of mind by complainants' agents, and then put on the stand in that condition to give out as testimony not their own independent recollections and memories, but that which has been forced upon them by others.

The operations of complainants' agents upon them began at a very early day. They were there to see the

Kissingers before the existence of Mr. Draper was known to defendants. In fact, the very same man who first interviewed Mr. Draper in January, 1882, went directly from Dover to Easton to see Mr. Kissinger, as the latter himself testifies (C. Vol. 1, 573, X. Q. 226), and from that time on the record shows the frequent visitation of other of complainants' agents, especially Mr. John C. Comfort.

We have seen what pressure was brought to bear upon those of defendants' witnesses who were recalled by complainants, notably David Cowens, and upon those also who refused to be influenced, such as Dr. Traver, Mr. Thomas W. Morley and Mr. Harper, and from this can judge how far witnesses could be persuaded to go who were not at all embarrassed by any previous sworn statements honestly given and based solely upon their own independent recollections.

Aside from this well-founded criticism, the testimony of the Kissingers is of negative character. They say that things did not exist at times at which a greatly preponderating number of witnesses for defendants most positively testify they did exist. We have elsewhere discovered evidence of this character, and shown its utter worthlessness.

The character of Mr. Kissinger, as given by his neighbors, is that he is slow, procrastinating, careless, negligent, dilatory, always hard up, never paying his debts, and forever borrowing (David Cowens, D. S. reb. 703; I. H. Harper, Id. 658; Leonard Swartz, Id. 689; John W. Cowen, Id. 724-5; Brabson, Id. 971; Strine, Id. 799-1005). He rented the farm of Mr. Draper, but was always behind with his rents, and is to this day indebted to him (Draper, D. S. rej. 181). As an example of his thrift, we find the appraised value of his horse when he lived at Milltown to have been $5! His unreliable memory and confessed perjury we have hereinbefore commented on.

Zimmerman's character and memory have also been criticised. If he could swear positively that Mr. Draper was not at the farm prior to the fall of 1877 (Vol. 1, 661, X. Q. 416), when the latter is proven conclusively to have been there in Feb., 1877, for a number of days, and could, with equal positiveness, swear that Mrs. Draper was never up to the farm with her husband, when she was, in fact, there for a week at the time of the alleged occurrence of other events about which he testifies, he certainly could be easily mistaken in his facts and dates abous the ram.

John Kissinger, as we have seen, never saw the ram, and don't pretend to know much about it.

George Franklin admits having told complainants' agents, after a previous interview with them, that he and his father and brothers had talked the matter over and had "fixed upon" the dates (C. Vol. 1, 586, X. Q. 42).

Cyrus' memory for dates is bad. He cannot even say whether his father moved from Marysville to Easton, Maryland, in 1880 or 1881, though that was a recent event and likely to make an impression upon his mind (C. Vol. 2, 1479, X. Q. 172), but he can with positiveness testify that Mr. Draper was up to the farm in the fall of 1876 (Ibid. 1484, X. Q. 235), and that he was not here in the fall of 1877 (Ibid. 1481, X. Q. 197), while the proof is absolute that Mr. Draper did not go near the farm in 1876, and that he was there in the fall of 1877. His account about getting the auger from Keller is very detailed and circumstantial (Ibid. 1508, Q. 523), yet, if his father's testimony be true, it is all a miserable lie from beginning to end.

Other witnesses, outside of the Kissinger family, relied upon by complainants to show that there was no ram in prior to 1878, are George W. Boyer and his wife, George E. Zehner, J. J. Kerr, Mrs. Thos. Draper, Miss Virginia M. E. Draper, Henry Foulk, Benj. Franklin Zimmerman, Mrs. Louisa Crouse, John M. Vink, Mrs. Sarah Moore, Robert O. Moore, John J. Wenrich, Simon G. Eppler, Herman J. Eppler.

Mrs. George Boyer is a witness of a purely negative character. She testifies (C. Vol. 2, 1543) that she went up to the Draper farm in peach season of 1878, and at that time helped fetch some water, and got it out of the spring itself. She says she didn't see any ram on the place; neither did she see the wooden feed-pipe that led from the spring (C. Vol. 2, 1545, X. Q. 44) where she got the water; though the testimony of Mr. Kissinger and his boys' shows that that pipe was in at that time, and had been since the spring of 1878, while defendants' witnesses prove it to have been there as early as 1876. This does not speak well for her observation of things on the farm, but is a good illustration of the value of negative testimony.

The ram itself was an inconspicuous-looking object, and below the surface of the ground (see Exbt. Photo of Kissinger Place, Nos. 4, 5, 6), and was not a thing to attract her attention.

It is not singular that they had to bring water at that time from the spring by hand, because Zimmerman, who lived on the place, testifies that the ram didn't work in dry weather when the spring was low (J. Zimmerman, C. Vol. 1, 650, X Q. 401). Peach season is a dry time of the year, and the spring when she was there was probably too low to work the ram, or else the ram was not running because of some of the various disorders with which it seems to have been frequently affected. If they wanted drinking water the spring was the place to get it, for the evidence is that that which passed to the house by way of the ram was too warm to drink.

Geo. W. Boyer, another negative witness, says he, also, was up at Kissinger's in the peach season of '78, and *didn't* see any ram, though they told him they were going to put one in (C. Vol. 2, 1548). What they told him, if anything, was, probably, that they were going to *re*-put the ram in or repair it.

G. E. Zehner, a preacher, is another negative witness (C. Vol. 3, 1840). He says he also was at Kissinger's in peach harvest in August or September, 1878; that he took a meal there; that he heard complaints of the difficulty of getting water. He didn't see the ram; wasn't told there was not one there; wasn't told they were going to get one there, but is "*morally positive*" that there was none there *in successful operation*, or there would have been water, and no complaints about the difficulty of getting water.

He didn't remember to have seen pipes nor logs, nor horses, nor the dry-house, nor the bake-oven, nor other objects proven to have been on the place at the time, and about the only things he does remember seeing, and in regard to which he is more than "*morally positive*," were peaches, and of these he seems to have gotten plenty.

J. J. Kerr, also a preacher, is another negative witness. He was called (C. Vol. 3, 1873) to prove that while he made several pastoral visits to Mr. Kissinger's family in 1878, he didn't see any hydraulic ram nor any pipes there. On cross-examination the fact was developed that when he called he always went in at the front door, and from there to the parlor, and never at any time went around back of the house, or to any point where the position of the ram or pipes could be observed. It was never contended that there was a ram at the front door or in the parlor. The most he can say is that Kissinger one day in the fall of '78 came in, in his shirt sleeves, apologized for his appearance and said he was getting ready for the ram. It is quite probable that at this time the repairing and reconstruction of the ram was taking place.

William Ross, another of complainants' witnesses, testifies (C. Vol. 3, 1811) that he worked for Mr. Kissinger from the spring of '76 till August of that year. He attempts to fix the date by the circumstance that at that time his father was living in Henry Eichelberger's house. But this proves nothing, especially in view of the fact that he says, upon cross-examination, that he don't know when his father moved in that house, nor when he moved out of it (1825, X. Q. 130, 131).

He alleges that while he was working at Kissinger's the water was carried up from the spring; that there was no ram on the place; that no preparations were being made, or had been made, for a ram; that there were no logs that had been bored for pipe, though there were some fence-posts for a post and rail fence, which he says were lying east of the barn, near the pale fence, and which he also says, in answer to a leading question putting the precise words in his mouth (1814, Q. 28), were near the *cherry trees.*

He further says, that after he left Kissinger's, in August, 1876, and in the peach season of that year, he noticed two drains or ditches, which had been dug on each side of the road, which led from the house to the barn to drain the water down from the house.

The object in calling this witness was evidently, therefore, first to disprove that there was a ram on the farm in 1876; secondly, to contradict defendants' witnesses, Mr. and Mrs. Champion and Mrs. McFarland, who had testified to seeing, in 1876, the pile of bored logs lying east of the barn, by showing that what they must have seen was the pile of fence-posts that this witness refers to; and, thirdly, to contradict those of defendants' witnesses who testify to seeing trenches for the ram-pipes between the house and the ram, and to show by this witness that what they saw were the little drains alongside the road between the house and the barn.

We have seen that the witness is not able to satisfactorily fix the time when he was working for Kissinger as being in 1876. If he ever worked for him, which is exceedingly doubtful, as no one corroborates him in this, it might have been before '76, or some other time. As to the fence-posts, while he is able to say posi ively that there was a pile of fence-posts lying at the place he describes, he can't say whether they were in one pile or two piles, nor how long or how thick the posts were, nor how high nor how broad the pile was, nor any particulars, or any approximation to particulars, about it. He says, however, he was never within thirty yards of the posts, which is a sufficient reason for his not being able to testify more particularly about them, and also perhaps a reason for his not knowing whether they were fence-posts or log pipes.

Concerning the drains along the road between the house and the barn, he admits in his cross-examination that he didn't see them in the peach season in 1876, as he testified to in his examination-in-chief, but that it was about two years after he left the Kissinger farm that he saw them (1823, X. Q. 113); or, in other words, in 1878.

It is more than doubtful if there were *ever* any drains at the place he speaks of. The hill is a very steep and even one, and there is no necessity for them. What the complainants were endeavoring to exaggerate into ditches, and have even placed on the "Ives Survey" (C. Vol. 3, 2450) as such, are nothing more or less than the ruts of the old road, which is faintly seen in Defendants' Exhibit Photo. Kissinger Place, No. 5.

The vague, indefinite and negative testimony of this witness, if believed, would not be sufficient to overcome the positive testimony of the witnesses he was called to rebut; but whatever probative force it might otherwise have, it so completely vanished before facts developed in his cross-examination, that we have not the slightest idea the court will give his testimony a particle of credit; on the contrary, we believe that the calling of him will react upon the complainants, and lead the court to believe that in their extremity he was procured to swear falsely. In the first place he appears to have been sworn and examined under an assumed name, for he admits (X. Q., 154) that his true name is not "Ross," but "Forkenross." And while he denies that he is not commonly known in and about Marysville as "Chicken Ross" (X. Q. 149), the fact that he is known in that neighborhood by such euphonious title is abundantly proven by three respectable citizens of Marysville, namely: Francis S. Strasbaugh (D. S. rej., 114), Ephraim P. Brenneman (Ibid., 115), and Aaron H. Coel (Ibid., 115).

He admits that he has not been in Marysville for two years, though he protests that there is no particular reason for his having stayed away, but when pressed confesses that during that period there was a charge of fornication and bastardy lodged against him, which he after settled by paying the prosecutrix (X. Q., 142, 143). He also swears that this was the only charge of a criminal nature ever made against him (X. Q., 144); but afterwards, not being able to stand up under the cross-examination, admits that he was at one time charged with stealing pigeons, and at another time with stealing chestnuts, and with disorderly conduct. As to the chestnut charge, he says he was released upon paying for the chestnuts and the cost of the proceedings, the recollection of which upright course of conduct tempts him to certify to his own character by the remark: "We were honest, that's the reason we paid it; other ones slipped."

But this burst comes too early, for he afterwards admits being discharged by Mr. Al. Seidel because of being caught in improper relations with a colored woman in Mr. Seidel's employ (X. Q., 165), and also confesses to having stolen corn from Mr. Seidel's corn-field, and being caught at it by Mr. Harry Seidel, adding, most honestly: "*I never deny the truth*" (X. Q., 179).

All these, and other irregularities in his conduct, show him to be a low-lived fellow and a petty thief, to have well earned his title "Chicken Ross," and to be a person who could be made to swear to most anything for a trip to Philadelphia, and his "witness fees" of five dollars a day and expenses, the usual rates paid by complainants (see Cowen, C. Vol. 3, X. Q. 47).

Mrs. Thomas Draper and Miss Draper were both called by complainants, the former to prove that she was at Kissinger's with her husband in November, 1877, and didn't see the ram, and the latter to prove that she was there with her father in November, 1878, and did see the ram. Mrs. Draper only says she doesn't think there was any ram there (C. Vol. 3, 1882). But, as she was there but four or five days, and was only at the Kissinger house mornings and evenings (X. Q., 31), and didn't go about the farm much (X. Q., 45), her opportunities for noticing whether the ram was in or not were not very good. As an illustration of how little she observed, she testifies, when asked if she noticed any improvements on the building since she was last there, that she did not, though it is proven most conclusively that just previous to that time the new front porch had been built and the large observatory had been put on top of the house. She says several things, however, in her cross-examination, that tend to strengthen defendants' theory; for instance, that her husband visited the farm about once a year while Kissinger lived on it, and that prior to that visit of hers to Marysville she had heard talk about the putting in of a ram on the place.

Miss Draper says that she arrived at the farm Monday, Nov. 11, 1878, and remained until the following Friday evening, and she *judges* that the work on the ram, which was then in, was not all completed, because the end of the discharge pipe was propped up on boards, and there was no upright piece on it to throw the water out (C. Vol. 3, 1887, Q. 10); but her recollection about this must either be faulty or else Jesse Wagner, the stone-mason, another of complainants' witnesses, cannot be relied upon, because, he says that when he was there, walling in the ram, on the 6th and 7th days of Nov. 1878, four days before Miss Draper got to Marysville, according to her testimony, the discharge pipe was then in place; that it rose up about three feet from the ground, and was bent over and downward, and discharged into a tub or barrel placed beneath it (C. Vol. 2, 1260, X. Q. 41 and 36).

Defendants' theory is strengthened by her cross-examination also, as she testifies that it was the habit of her father to visit the farm about every year, after Kissinger moved on it (1890, X Q. 39), and that she thinks her father was up there at least twice previous to 1876 (1892, X Q. 53), thus corroborating Mr. Draper, who says he was there once in the summer or fall of 1874, and again in the spring of 1875.

Henry Foulk testifies that one time his son-in-law Reuben Wallace, thought of renting the Draper farm, but did not because he thought the farm too small, and also because the water supply was inconvenient.

He further says that after this, on an occasion when Mr. Draper was up at Marysville with his wife, Mr. Draper told him that he had intended to get a ram put in to carry the water up to the house (1850, C. Vol. 3, Q. 17), and that on another occasion, when Draper was up with his daughter Jennie, he saw the ram in operation but not working satisfactorily (1852).

The value of this witness' testimony centers about the time when Wallace made the objection to occupying the Draper farm, and the time of the witness' talk to Draper about it. The fact that Mrs. Draper, on one occasion, and that Miss Jennie Draper, on another occasion, accompanied Mr. Draper to Marysville, is one admitted by both complainants and defendants, and is proved by witnesses on both sides.

Now inasmuch as the witness says Wallace made *two* objections to occupying the farm, to wit: that respecting its smallness and that in regard to the water supply, it is quite possible that, as a matter of fact, he made but one of these objections, to wit: that in regard to size; and the other objection the witness has, perhaps, unconsciously supplied himself, thinking from his pretended knowledge of the matter that Wallace must have made that objection also. Wallace is still living, and it is a significant fact that he was not called by the complainants to put the matter beyond question.

Then as to the time when the alleged objections were made by Wallace. The witness says that Wallace at that time was living on Mr. Keller's farm, and that he lived there from the spring of 1877 till the spring of 1878. This does not intimately concern the witness' own business. Wallace may have lived somewhere else at that time. The witness says that Wallace at different times lived on John Rose's farm, Mr. Rinehart's farm and two different farms of Keller's, and the date when Wallace moved on either of these farms is not positively fixed by any evidence, nor is the length of time he lived on either of them positively fixed.

But suppose the fact to be admitted that in 1877, say, Wallace objected to going on the Draper farm because of the inconvenience of the water supply, does that militate against defendants' theory? Certainly not. The testimony of a score of defendants' witnesses is to the effect that though the ram was on the farm in 1876 and 1877, it was most of the time out of order from breakage, freezing, leaky pipes, or because of low water, and the testimony of the Kissinger family shows that even after the improvements wrought by the putting in of the new iron pipes and the stoning up of the pit by Wagner, in 1878, the ram did not work well nor satisfactorily, and all agree that it stands at the present time useless and impotent to perform its functions, and has been in the same condition for years.

It cannot, therefore, with truth be said that at any time, either before or since the ram was put in—whenever that was—the Draper farm has not been objectionable because of the inconvenience of the water supply; and if, in fact, it be true that Wallace at one time told this witness that he could not occupy the Draper farm because of the inconvenience of the water supply, it by no means follows that he must have so told him prior to the putting in of the ram, for the same remark could with truth have been made at any time from the clearing of that farm down to the present day.

In respect to the alleged declaration of Mr. Draper that he intended to put in a ram on the farm, it is clear that the witness may be mistaken as to the time when it was made, if ever. He testifies that he had known Mr. Draper for eighteen years, that when the latter lived in Marysville they frequently visited; that when Mr. Draper came up to Marysville from Delaware he always came to see him (1856, X Q. 57), and that he so came up once nr twice a year (Ibid. X Q. 59), and that he thinks he came up twice the first year after Kissinger moved on the place (1857, X Q. 62).

From this it will be seen that it may have been on the occasion of some other visit than that of the fall of 1877, that Draper made this declaration to him. He is certainly wrong about going over to Bloomfield with Draper at the time that Draper was up with his daughter, as he testifies (1853, Q. 35), if the daughter herself is to be credited, for, while he says that on that occasion he went to Bloomfield with Draper on Saturday, and that returning Draper stayed over Sunday with him, Miss Draper testifies that she and her father were only at Marysville between Monday and Friday night of the same week (Miss Draper, 1889, X Q. 24). About the Bloomfield trip, he has evidenntly confounded Draper's visit with his daughter with some other visit, and it is fair to presume that, in like manner, he has confounded Draper's visit with his wife with some other visit.

This reasoning strikes one with additional force in view of the fact that the witness is about 70 years old, and admits that his memory is bad (1856, X Q. 56).

John J. Wenrich was called by complainants (C. Vol. 3, 2376) to rebut, in a rambling and indefinite way, the testimony of those of defendants' witnesses who had seen Kissinger boring logs in 1875. His testimony is to the effect that during the summer of 1875 he was engaged in chopping wood, building a pig-pen and a shed near the dwelling house, on the Draper farm, and that while this work was going on there were timbers lying about the place. These timbers complainants hope the court will conclude were the identical timbers defendants' witnesses saw. But we think there is no liability of the court going wrong about this. None of the timbers are shown to be of a size or kind suitable for piping, and none of them appear to have been bored in any manner. If defendants' witnesses had merely testified to seeing timbers on the Kissinger place without remembering how they looked, or what was being done with them or to them, or where they were, testimony of the nature offered by this witness might have some slight weight; but when defendants' witnesses testify with particularity to having seen Kissinger boring logs with a pipe-auger, and to having sat on the logs and conversed about the work being done upon them, and the purpose for which they were intended (see, for instance, testimony of John H. Harper, D. S. reb. 654, and Joseph Gensinger, Ibid. 770), there is not the slightest probability that they can be mistaken.

Robert O. Moore (C. Vol. 3, 2371) testifies to having seen timbers lying on trestles near the barn on the Kissinger place while passing along the Valley Road about June, 1878 (2372), and to have afterward inquired of Mr. David Cowens what Kissinger was doing with those logs, and to have been informed that they were going to put a ram in to throw water up to the house.

It is highly improbable that this witness, or any one else, would have noticed, or could have been able to distinguish, such an object as a log lying on trestles at a point so far from the Valley Road as the enclosure east of Mr. Kissinger's barn was.

Two photographs, taken with powerful magnifiers, were put in evidence by complainants to show that this enclosure could be seen from the Valley Road; but the photographer, James K. Cotterel, produced to prove the photographs, was obliged to admit that he could not distinguish with his naked eye a cart or wagon within that enclosure from the point where the photograph was taken (C. Vol. 3, 2403, X. Q. 26). Moreover, the witness, in saying that he saw Kissinger boring logs in June, 1878, contradicts Cyrus Kissinger, who says the logs were all bored and laid in the ground in the fall of 1877, and also contradicts John M. Kissinger, who testifies the logs were all finished when he left home, in May, 1878.

Attention is especially called to the vague and indefinite manner in which Moore testifies. He "thinks" Mr. Cowen told him; he "thinks" it was about June, 1878; he "thinks" he was hauling stone for Jesse Wagner, etc.; he "supposes" he was on the wagon; and he "thinks" the logs and trestles were on the bank, between the fence and the ram.

Mrs. Sarah Moore (C. Vol. 3, 2369), the wife of Robert O. Moore, testifies to having been on the Kissinger place in the spring of 1878, and when she is asked how the Kissinger family got their water during that spring and summer, she ventures the very unsatisfactory opinion that they "carried it up that hill, so far as I know."

She also testifies to having seen, on a later occasion, a barrel in which the ram-pipe discharged, and that her father bought that barrel at Kissinger's sale in 1880, and has it yet; but this does not, by any means, prove that that barrel, or that the ram, was not at Kissinger's when she was there in the spring of 1878, and before that time.

Mrs. Louisa Crouse and John Vink (C. Vol. 3, 2467; Ibid. 2480) were two witnesses called by complainants for the purpose of corroborating the Kissinger family about the bursting of the iron pipes, and to contradict two of defendants' witnesses, viz.: John H. and Joseph W. Rhoads, who had testified to seeing a screen on the end of a wooden pipe in the spring on the Draper farm in the fall of 1876.

Mrs. Crouse's former name appears to have been Mrs. Stotter, and between the years of 1874 and '80 she kept a tin shop in Marysville, and between Jan'y, 1878, and March, 1879, employed Vink as one of her workmen. She produces a book in which there appears an entry under date of Nov. 4, 1878, of a charge against George Kissinger, reading as follows: "To funnel and soldering pipe, .75."

Both of them pretend to remember particularly about the items contained in this charge, and the circumstances under which the charge was made, but so apt are their memories in regard to this particular charge, and so very poor are they in regard to other charges against Kissinger in the same book, that the conclusion is irresistible that they had been considerably coached.

Both of them undertake to say that the "funnel" referred to in the item was not a funnel at all, but, according to Mrs. Crouse, a screen, and according to Vink, a strainer, which Kissinger said he intended to use on a pipe to prevent dirt and leaves from flowing into such pipe from his spring.

They also both say that the pipe, which appears by the entry to have been soldered, was one of Kissinger's iron ram-pipes. Her testimony is that, on the morning of Nov. 4, 1878, Mr. Kissinger came to her shop, brought a piece of pipe to be soldered, which he said had been frozen and bursted shortly before, and ordered the funnel to be made; that the funnel was made and the pipe mended the same day, and she thinks somebody else than Kissinger came for them and took thme away.

Vink, on the other hand, testifies that Kissinger came down and ordered the funnel made, and came back the same afternoon and got it, and that on the following day he came down about 7:30 o'clock in the morning and brought the pipe, which was bursted, and which, he said, he wanted mended; that he charged both jobs under one entry.

Both of them and the book entry contradict James Zimmerman, who testifies that there was no pipe at all in before Drawbaugh came, Nov. 4, '78 (C. Vol. 1, 658, X. Q. 78), and that Drawbaugh was only getting ready to put in the pipe Tuesday morning, Nov. 5, '78, when he left home (Ibid. 645, X. Q. 232), and that it bursted after he came home, Nov. 11, '78 (Ibid. 658). If Mrs. Crouse and her book are correct, the pipe which Kissinger brought to her shop Nov. 4, must have burst before that time; and it could not have burst the night before, as, according to Vink, the pipe was brought about 7 o'clock in the morning, and it was dry, and there was no ice nor frost in it, as there would have been had it burst so recently from freezing.

Mr. Kissinger, on his recall, tried to straighten out this matter of the bursting of the pipes, and testified (C. Vol. 3, 2411) that *one* pipe burst from freezing the first night it was laid, and that two joints burst again about four weeks afterwards (Ibid. 2412).

But, as usual, he contradicts Cyrus, who testifies positively that the first night the ram was put in the *two joints* of pipe burst (C. Vol. 2, 1487, X Q. 275).

If Vink's testimony about the conversation with Mr. Kissinger when he made the funnel for him on the 4th of Nov., 1878, be true, certain it is that the wooden pipes had been used, and that the ram had been in operation long prior to that date, for he says that Mr. Kissinger complained to him about having had a great deal of trouble with the leaves and dirt getting into his wooden pipe and clogging it up, and that he, Vink, after the difficulty had been described to him, got up this screen for him (C. Vol. 3, 2486).

The positive testimony of defendants' witnesses, John H. and Joseph W. Rhoads, that they saw a screen on the end of the pipe in the spring in 1876, is not overcome by any evidence, however positive, that a screen was made for the pipe in '78, for it is quite likely that the one first put on, being in an exposed place and liable to be knocked off every time a pail of water was dipped from the spring, had become lost or damaged by accident or age, and the the pipe clogged up, so that when the general renovation of the ram took place in the fall of '78, it became necessary to provide a new screen.

Herman J. Eppler and his brother, Simon G. Eppler, both give testimony as to the preparatory work for the ram in the Kissinger place.

Herman says (C. Vol. 3, 2180-1) that in the latter part of 1877 he and his brother Simon were out hunting, and in passing up through the woods on the Draper farm, noticed that some chestnut timber had been cut; that they went down and inquired of Mr. Kissinger, whom they found at the barn, what the timber had been cut for, and that Mr. Kissinger said he had cut them for pipes or spouting for the ram. He further says that the first time he ever saw the ram was in the fall of 1878, when Miss Draper was there, and he produces a letter from Mr. Draper to himself, dated Dec. 18, 1877, in which mention is made of the ram, and says that at the date of that letter the ram was not in.

It is not necessary at this point to reiterate our remarks upon the untruthfulness, unreliability and bias of this witness, made in considering his testimony on the subject of the ordering of the ram, but refer the court back to the former discussion of him (Ante, p. 7).

As against the clear and positive testimony of Mr. Draper in regard to the ordering of the ram, the testimony of such a man as this cannot stand, nor can what he says about the cutting of the timber for the log pipes overcome the positive testimony of the numerous unimpeachable and unassailed witnesses for the defendants who swore to the boring of such pipes in 1875. From the fact that he was at one time Mr. Draper's agent it does not follow that he was in a position to know more about the ram than Mr. Kissinger's neighbors, who testify for defendants about the existence of the ram in 1876–7, but quite the reverse. He lived in the village of Marysville, and attended to his shoe store. They were close by the Draper farm, and their opportunities for knowing what was going on there were better. In point of fact, he admits that he had nothing to do with the ram nor the ordering of it, but that it was purely a matter of arrangement between Mr. Draper and Mr. Kissinger (C. Vol 3, p. 2263).

Indeed, so far as the cutting of the timber for the pipes is concerned, this witness testifies that his brother, Simon G. Eppler, had a dispute with him, prior to being called to the stand, as to when such cutting took place, Simon insisting that it occurred in 1876, and that at that time they went down to Mr. Kissinger's, and that he, Simon, went and looked at the ram (X. Q. 726), and Simon himself, when called to the stand (C. Vol. 3, 2325), does not venture to swear on his own recollection when the occurrence took place, but only says that it was after his brother Herman became Mr. Draper's agent, and he knows it was then from the fact *that Herman told him so!*

Attempt, no doubt, will be made by complainants to construe the passage in the letter of Mr. Draper to Mr. Eppler, dated Dec. 18, 1877, referring to the ram, to mean that at that time the ram had not been put in. Let us see if such a construction be a fair one. Here is the letter:

MAGNOLIA, Decem. 1, 1877.

MR. HERMAN EPPLER.

Dear Sir,—Inclosed I return the agreement for Kissinger with the stock claus entirely left out. The understanding between him and me was, that I was to find one-half the young stock and one-half the corn to feed them. My only object was to feed the grain on the farm, so as to improve it. But if Kissinger don't like that, all right with me; and if He won't sign this agreement, He can stay under the old agreement and pay a certain Rint; and if he don't like that I think the Farm can be Rented to Esqr. Foulk's son-in-law, Mr. Wallace. Kissinger could pay all his Rents in improvements if he would. The Ram to throw up the water he was to put in, and the Barn wants repairing. There needs a back Poarch and smoke-house and Privy. He could haul the stone, do the carpenter-work, and change around so as to have but little money to pay; but I must have my rents in some way. I can't afford to keep the property and get nothing for it. I think I am as easy satisfied as anybody could be, but I must have my rents somehow. Write to me at once and let me here what he does.

The calculation is now that my vessel will go to Philadelphia next trip. If she does, you may look for the Oysters about the middle of next week.

We are all well as usual.

Ever truly,
THOMAS DRAPER.

To properly construe this letter one must put himself in the writer's place. The old agreement between Mr. Draper and Mr. Kissinger has evidently not been satisfactory, and there has apparently been trouble about the payment of the rent. Mr. Draper makes out a new lease, and sends it to Mr. Eppler for Mr. Kissinger's approval. In his letter of transmittal he desires to indicate to Mr. Eppler how easy "Kissinger could pay all his Rents in improvements if he would." Of the barn, porch and smoke-house, etc., he speaks in the present tense, "the Barn wants repairing," now, presently, "There needs a back Poarch, and smoke-house and Privy," etc., but when he comes to allude to the ram, his mind turns from the present to the past, and he says, "The Ram to throw up the water he *was* to put in," using the past tense. He is thus careful in the use of his language to distinguish between what is yet to be done and what *has been* done.

The great preponderance of evidence shows that Mr.

Kissinger had, as early as 1876, put in the ram at his own labor and expense, and was to be allowed for it. No settlement had been made at the date of the letter, and none was in fact made till November, 1878 (Draper, D. S. rej. 177), nearly a year afterward, and then, as we have seen, the charge for the ram *was put back into the account for 1876, where it belonged* (D. S. rej. 178).

The whole tenor of the letter shows that Mr. Draper appreciated that the quickest way to get anything out of Mr. Kissinger was to have him put improvements on the farm and be allowed for it, and he indicates to Mr. Eppler that the barn wants repairing, and that a back porch, smoke-house, etc., are needed, and cites the ram merely as an instance where Mr. Kissinger had earned a credit on the rent account by reason of an improvement made by him.

He says that the barn wants repairing, and that the porch, etc., are needed, but it will be carefully noticed he does not say the *ram wants to be put in!*

The complainants appear to have long doubted the propriety of putting this letter in evidence, as they had it a year in their possession before producing it.

Benjamin Franklin Zimmerman, another purely negative witness, testifies that in the spring of '77 he visited his brother, J. C. Zimmerman, on the Kissinger place, and at that time the family brought water from the spring in buckets, and that he, too, brought some in that way. He says he didn't see any ram there; but, as a matter of fact, if he had he would not have known it, because he admits that up to that time he had never seen a hydraulic ram, nor anything said to be a ram (C. Vol. 3, X. Q. 82). The fact that they were bringing water from the spring in buckets does not prove that there was no ram on the place, because his brother, James, tells us that after the ram was there it was often out of order and would not work, and that they then had to carry water up in buckets (C. Vol. 1, 659–660) at such times.

Besides the foregoing testimony offered by complainants we have the evidence of the railroad books (C. Vol. 1, 554 and 555; C. Vol. 3, 2491) which show that two bundles of iron pipe were received at Marysville, from Philadelphia, consigned to Mr. Drawbaugh, and were delivered to Zimmerman on Mr. Kissinger's order some time in September, '78. We have further the testimony of defendants' witness Strine (D. S. reb. 1007, X. Q. 77), to the effect that in the latter part of the summer—but what year he could not recollect—he heard Mr. Kissinger complain in Mr. Morley's store about the non-arrival of some pipe which he expected by rail (Ibid, 1001, Q. 40), and the testimony of three others of defendants' witnesses, namely, Henry Shaffer (D. S. reb. 874, Q. 20), G. W. Rhoads (Ibid, 1051), and John W. Cowen (Ibid, 718), and of Zimmerman himself (C. Vol. 1, 630, X. Q. 86), to the effect that Zimmerman some time in the fall of '78, and probably in September, hauled those pipes from the Marysville station out to Mr. Kissinger's, and we have, in addition, the testimony of complainants' witness, Jesse Wagner, supplemented by a book entry, to the effect that on the 6th and 7th days of November, 1878, he built a stone wall around the ram, which was in at that time (C. Vol. 2, 1258).

The evidence offered by both complainants and defendants concerning what was done to the ram in 1878 tends simply to establish the fact that at that time steps were taken by the Kissinger family to make the ram what it had not up to that time been—a practically operating and serviceable contrivance; and the establishment of that fact is not only not in conflict with defendants' theory, but is in entire harmony and accord therewith. A glance back at defendants' testimony will demonstrate this. Their witnesses, Theo. Fenn, Peter Kaffenberger, Gault, Fesler, Strine, W. W. Meals, James Champion, the carpenters (Brabson & Taylor) who worked on the porch and observatory job, the Board of Triennial Assessors for 1876 —*i. e.*, Dr. Traver, Mr. Dissinger, and Mr. Morley—and the members of the Cemetery Association (see Brabson), all testify that the operation of the ram during the years 1876 and '77, at the times they respectively saw it, was intermittent, uncertain and unsatisfactory; that sometimes it would run and sometimes it would not; and when it did, it delivered a sluggish stream, which, according to Theo. Fenn, was about the size of a goose-quill (D. S. reb. 781); according to Strine, was about the size of a rye-straw (Ibid. 1001); according to Peter Kaffenberger, was so meagre and came so slow as to discourage him from putting in a ram like it on his own place (Ibid. 919); and which, according to Brabson, Taylor & Clendennin, when it reached the point of discharge in the summer season was so warm as to be unfit for drinking purposes (Ibid. 972).

Not only does the supply appear to have been deficient, but the ram itself appears to have been continually getting out of order, as testified to by Champion, Strine, and the triennial assessors, among others, while the wooden pipes were leaky at the joints (Strine, Ibid. 1000), and the metal pipes were old, rusty, imperfectly joined, and constantly bursting (Strine, Ibid. 1001; Theo. Fenn, Ibid. 781, Q. 39; Henry Shaffer, 873; Gault, 863, Q. 45; Funk, 913, Q. 18). The testimony of the unsatisfactory character of the ram and its pipes is not based solely upon the opinions formed by the witnesses when they saw them, but they testify to declarations made by Mr. Kissinger himself to the same effect (Theo. Fenn, Ibid. 781, Q. 39; Brabson, 972, Q. 19; Strine, 1000, Q. 34), and also to similar declarations made by Zimmerman (James Champion, 602). From this it appears there was necessity enough for repairing the ram and putting new iron pipes in in the fall of 1878.

Those of defendants' witnesses who testify to seeing the ram in 1876 and '77 do not describe it as having a stone wall about it, such as Wagner testifies he built in 1878, but some say that there were some loose stones about the hole (Kreidler, D. S. rej. 131, Q. 16; John Kaffenberger, D. S. reb. 955, Q. 36), while others say it was boxed in with planking (Gamber, 742, D. S. reb. Q. 37; Givens, D. S. rej. 126, X. Q. 102; Trafford, D. S. rej. 75, Q. 23). The boxing in of the ram with planking was probably the first and most obvious way suggested to Mr. Kissinger's mind of protecting it. He is a carpenter by trade (C. Vol. 1, 556, Q. 42), and it is only natural that he should have contrived with reference to his knowledge of that craft. The loose stones may have supplemented the boxing that he made. The displacement of the wooden, and probably at that time rotten, protection by the stone wall by the stone-mason, Jesse Wagner, in the fall of '78, was but another part of the improvements made at that time.

Stress is laid by complainants upon the fact as testified to by Wagner that when he went to Kissinger to lay that wall he found a square hole dug and the ground around the hole looking as though the latter was freshly dug. But there is nothing remarkable in this circumstance. If the ram had been there for ten years boxed in by boards, or by boards and loose stone, and it was desired to displace these protections by a neatly and regularly laid stone wall, such as Wagner constructed, the hole would have had to be dug out, squared and trimmed up, and, as the result of this work of preparation, there would of necessity be left evidences of freshly-turned earth about the hole.

Wagner does not pretend to say that anything that was in the way of digging or squaring the hole after he got done there. When he arrived he found the pit all squared and ready for him, and the ram was in it in operation, and he does not know how long it had been there. Even the stones with which he built the wall were lying there waiting for him.

The whole evidence about what transpired at Kissinger's in the fall of '78 indicates plainly that what was done at that time, so far as the whole water-supplying apparatus was concerned, was to simply fix it so that it would work; and to that end the old, rusted, bursted and leaky iron pipes were replaced by the new ones ordered from Philadelphia; the ram itself was taken to Drawbaugh's shop, cleaned, put in order, and brought back by Cyrus, as he testifies; the old curbing to the pit was taken out and a neat and solid wall laid by Wagner, a skilled stonemason, and, to insure the completeness and success of the whole job, Drawbaugh was brought over from Milltown to superintend it, which accounts for his presence at Mr. Kissinger's again.

The complainants, in endeavoring to prove by a half-dozen negative witnesses that the ram was not put in at all prior to November, 1878, ask the court to entirely disregard the clear and unimpeached testimony of scores of defendants' disinterested witnesses, who testify most positively to having seen it there, and the preparations for it at many different times during the two preceding years.

Were the witnesses equal in point of numbers, the testimony of those called by defendants must prevail, according to well-settled rules of law respecting the value of affirmative and negative evidence; but the number of defendants' witnesses testifying to the existence of the ram prior to '78 is so much greater than the number of those who assert the contrary, that there can be no doubt of their preponderating weight.

But not alone by the oral testimony of witnesses is defendants' theory supported. Every book, every letter, every writing of any description that has been produced by either defendants or complainants containing the slightest reference to the ram or the pipes therefor, strongly sustains it. The letter from Mr. Kissinger to Mr. Draper, dated May 30, 1875, (D. S. rej. 169), indicates that prior to that date Mr. Kissinger had been looking about for piping for the ram, and had been told that only iron pipe would do to go from the ram up the hill to the house; the Draper-Kissinger account (D. S. rej. 178) shows that the charge of $60 for the expenses of the ram is entered in the account for 1876, among other items of charge proved to properly belong in that year's account; the letter of Mr. Draper to Mr. Eppler, dated Dec. 18, 1877, (Eppler, C. Vol. 3), speaks of the putting in of the ram as a matter already accomplished, a thing of the past, while the bill for the pipes procured in Philadelphia in July, 1878, shows that new pipes were obtained at that time to replace the old, rusted and worn-out ones first put in. All these writings are in harmony with each other, and in exact accord with defendants' theory.

Can they, too, be mistaken, as complainants contend the forty or fifty witnesses called for defendants are? In the nature of things it is impossible. They were prepared at different times by different persons, and without reference to each other. It is no mere coincidence that they all point in the same direction. They all tend to establish defendants' theory, because the latter is undoubtedly the true one.

It was not until near the close of the taking of testimony in this case that the letter of Mr. Kissinger to Mr. Draper, dated May 30, 1875, containing a reference to the old iron pipe for use in connection with the ram, was discovered by defendants.

A photo-lithograph copy of it is found in Defendants' Exhibits at page 138. It reads as follows:

"May 30, '75.

"MARYSVILL

"MR. DRAPER.

"*Dear Sir*,—i received you Letter about the pipse
"now they sey non will do but iorn pipe to go up hil
"now i can get som god ole pipe here now i want you
"to com up soon we got the pech tres al trimd and lok
"nice what sho you som farmin this year rite sone no
"more

"Yours truly
"GEO KISSINGER."

This letter was accidentally found by Mr. Draper in an old day book at his home in Delaware some time after his wife and daughter had been called to Philadelphia by complainants to give testimony in their behalf (Draper, D. S. rej., 168). Its important bearing upon the ram controversy was, of course, at once appreciated.

It had always been a part of defendants' theory that before the ram was first put in, in 1876, Mr. Kissinger had procured somewhere, probably very cheaply, a lot of old iron piping for use in conveying the water from the ram up the hill to the dwelling-house, and while several of their witnesses, notably Strine (D. S. reb. 1001) and Theo. Fenn (D. S. reb. 781), had testified that the pipes which they saw connected to the ram in 1876–7 were old, rusted and leaky second-hand iron pipes, the amount of evidence in regard to those pipes did not begin to compare with that relating to the wooden piping.

Mr. Draper's recollection is, as we have seen, that when he was up to the farm, in the spring of 1875, he saw the logs that Mr. Kissinger had cut for the ram-pipes; saw the auger that the logs were to be bored with; discussed the feasibility of terra-cotta piping, and agreed to write to Kissinger about the latter on his return home from that trip (D. S. rej., 169). From the fact that Mr. Kissinger's letter speaks of Mr. Draper having written previously about the pipes, it is evident that he did write as he promised, and from the further fact that in the letter Mr. Kissinger states that "now they sey non will do but iorn pipe to go up hil," it is apparent that Mr. Kissinger had, like Mr. Draper, learned that the terra-cotta piping they had discussed would not answer, because it would not stand the pressure.

So important, indeed, did this letter appear to defendants that, fearing its genuineness might be questioned, they thought it prudent to endeavor to get Mr. Kissinger to acknowledge it to be his. Mr. Draper was quite sure the letter was in Mr. Kissinger's handwriting, and the fact that he had found it among his own effects went far to prove its genuineness. Yet since he knew that Mr. Kissinger's handwriting was not always the same, and since so long a time had elapsed since the letter was written, he preferred to leave the matter to Mr. Kissinger (Ibid). Accordingly, Mr. Draper, Mr. W. K. Fenn and Mr. Melville Church went down to Easton with this and a number of other letters, and laid them before Mr. Kissinger. He acknowledged them all to be his, and also admitted that the iron pipes mentioned in the letter of May 30, 1875, were intended for the ram. Draper (D. S. rej. 192, Q. 86; Fenn, Ibid., 217, Q. 10; Church, Ibid., 257).

Afterwards, and as soon as complainants had found out that the whole fabric of their theory had been swept away by this letter and Mr. Kissinger's admission concerning it, they called Mr. Kissinger to the stand, got him to deny having made the admission (C. Vol. 3, 2406, Q. 21), and to gravely swear that the pipes referred to in the letter was not for the ram, but for the purpose of conveying water to the house by gravity from a small spring that came out of the opposite hill up back of the barn at a point higher than the spring which fed the ram; and they got David Cowens and Leonard Swartz, two of defendants' witnesses, whom they had previously tampered with and recalled, as we have seen, to come in and testify that they remembered that at some period of time which they cannot definitely fix it was proposed to take water from that upper spring. Cowens says he "thinks" it was in the year 1875 (C. Vol. 3, 2459, Q. 4), while Swartz says it was "*about* a year after he (Kissinger) moved back the second time" (C. Vol. 3, 2389, Q. 1). Cowens says he heard of the matter on an occasion when he was on the farm, and when Mr. Kissinger and Mr. Draper were both present; while Swartz testifies only to a conversation he had with Mr. Kissinger about what the latter and Mr. Draper had previously discussed (Ibid., 2392, Q. 15). Since neither of them swear positively it was the intention to get the water from this upper spring to the house by gravity, it is possible that when Mr. Draper and Mr. Kissinger were talking about putting in the ram in 1874 and 1875, the upper spring was referred to as a possible source of supply for the ram.

Mr. Draper swears that, to his recollection, no such thing as the gravity project for getting water to the house was ever even talked about (D. S. rej. 203), and it is apparent that it could never have been previously considered, since all admit the spring itself was a poor one, and only ran a part of the year (Draper, D. S. rej. 203, Q. 144; Cowens, C. Vol. 3, 2459, Q. 3).

Mr. Draper does say, however, that when the stone house was built, in 1867, he talked some of trying to open up the upper spring farther up the hill, and of laying a pipe from it to a trough in the barn-yard *on the same hill*, so that the stock might be watered more conveniently and their manure saved (D. S. rej. 203, Q. 145); and this was the only use to which the upper spring was ever thought of being put.

But it needs not Mr. Draper nor any other living witness to contradict Mr. Kissinger's story about what the pipes referred to in the letter were intended to be used for. The letter itself is sufficient. It says that "none will do but iron pipe *to go up hill.*"

This implies that other kinds of pipe could be used in a different place, as, for example, between the spring and the ram, but that only iron pipes would serve to go up hill. If other pipes than those intended for going up the hill had not been in Mr. Kissinger's mind, and previously discussed with Mr. Draper, it would have sufficed, and been more natural for him, to have simply stated "that none will do but iron pipe," without any reference at all to the hill.

Again, if the bringing of water from the upper spring were in contemplation, there would have been the same necessity for using iron pipe down one hill from the spring as up the other hill to the house, as the pressure in the pipes on both hills would have been the same. But nothing whatever is said of two hills nor of the use of iron pipes *down a hill.*

Mr. Kissinger's explanation of this letter is just about as satisfactory as that which he offers in regard to the entry of the $60 for the cost of the ram in the Draper-Kissinger account of 1876, and when it is contrasted with his admission to the exact contrary, as testified to by Messrs. Draper, Fenn, and Church, and with the conclusive testimony of Mr. Draper on the subject, we think the court will give it no weight whatever, but, on the contrary, will regard the letter as but another strong corroboration of defendant's theory, and a complete confirmation of Mr. Draper's testimony in regard to the ordering of the ram in 1874. And this conclusion will be further justified when it is borne in mind that the testimony shows that Mr. Kissinger did, subsequently to the date of the letter, get old iron pipes for the ram and put them in in connection with the ram, while, as he in cross-examination is forced to admit, he never procured or contracted for a bit of piping of any kind for conveying the water from the upper spring, nor did he ever dig a trench, deepen the spring, or, in fact, do a single stroke of work towards bringing the water by pipes from that upper spring towards the house or anywhere else (Kissinger, C. Vol. 3, p. 2447, X Q. 319-326).

This attempt on the part of the complainants to thus connect the iron pipes referred to in the letter with the bringing of a supply of water from the upper spring, after fully fifteen hundred printed pages of testimony had been taken, covering almost every conceivable feature of the water supply on the Draper farm, without a single word having been said about an upper spring, or the slightest reference of any kind having been made to it, is so weak and transparent as to impress one with nothing but the idea that in their extremity they are catching at straws. Its sublime audacity, however, perhaps eclipses anything else they have attempted in the whole case. Mr. Kissinger was not the originator of it. It was far too deep and ingenious for him, and was planned by an abler mind. We cannot perhaps point out the precise individual to whom the credit (?) of its conception is to be attributed, but this we do know, that nearly a month prior to defendants' first knowledge of it the contents of the particular letter in question were made known to complainants' agents and counsel, at Philadelphia, by Mr. Draper's younger son, John B. Draper (D. S. rej. 251), who had had previous instructions from Mr. Comfort to inform him of any newly-discovered evidence (D. S. rej. 252), and hence quite a sufficient time elapsed, before defendants knew anything about it, to enable the "upper spring" business to be set in motion, and to enable complainants' agents to again operate upon Kissinger, Cowens, and Swartz, and work them up to the proper frame of mind for testifying about it, so as, if possible, to be prepared to break the force of the letter when it should turn up, as they knew it ultimately must.

Kissinger, Cowens, and Swartz were all at Philadelphia after young John Draper had been there and told about the finding of the letter. Mr. Kissinger was not examined then on any subject, and though Mr. Cowens and Mr. Swartz were examined at that time upon other subjects (C. Vol. 3) nothing was asked them about the upper spring. Why were they not all examined about it? Because there lingered in complainants' breasts the hope that the letter, which up to that time had not been seen by defendants, might yet be lost, destroyed, or perhaps get into their own possession, and never come to light.

There was ample opportunity for "preparing" Kissinger, Cowens, and Swartz.

Mr. Kissinger was brought to Philadelphia to see Mr. Cowens (C. Vol. 3, 2441), and Mr. Cowens and Mr. Kissinger were both together sent down to Easton to see Mr. Swartz (C. Vol. 3, p. 2464.) Though it was out of Mr. Cowens' way to go to Easton, he explains why he went, as follows: "*Mr. Brooks* (complainants' agent) *said that if I wanted to go around that way he'd pay my way; it would cost a little more to go around that way, but if I wanted to go and see Swartz, he wouldn't mind having me go that way*" (Cowen, C. Vol. 3, p. 2464, X. A. 32.)

Neither the additional expenses of the trip nor the amount of time consumed, and to be paid for, weighed with complainants, however, though the former were considerable, and for the latter the witness was paid five dollars a day (Ibid, 2466, X. Q. 47).

It was doubtless a part of the programme to have Mr. Kissinger deny the genuineness of his letter, and had not Mr. Draper himself confronted him with it he would probably not have admitted it to be his. Even after his written acknowledgment of it had been made, it would seem from the rigor with which Mr. W. K. Fenn (D. S. rej., 215) was cross examined when called to prove Mr. Kissinger's signature to the letter, that complainants were still inclined to attack the genuineness of both the letter and of the acknowledgment; but finding the proof of the signature to the letter so fully made out, they shifted their ground, and concluded to call Mr. Kissinger, and have him admit the letter, but deny that the pipes referred to in it were for the ram.

More upon the subject of this letter we will not say, except to ask the court to carefully compare the testimony of Mr. Draper with that of Mr. Kissinger about the purpose of the pipes referred to in the letter, and to compare the testimony of the three gentlemen—Mr. Draper, Mr. Fenn and Mr. Church—with that of Mr. Kissinger concerning the latter's admission as to what those pipes were really intended for, feeling satisfied that the statements of Mr. Kissinger, by reason, as well of their loose and contradictory character, as of the previously admitted perjury of their author on other subjects, will not be allowed to prevail.

APPENDIX B.

THE FLOOD AND BRIDGE CONTROVERSY.

Another collateral controversy arose in this case, namely, with regard to the flood of August, 1873, and the carrying away of bridges along the Yellow Breeches Creek. Its origin was as follows:

E. B. Hoffman (D. Vol. 1, p. 481; recalled *Id.*, p. 660), a witness called by defendants, testified, among other things, as follows: That in 1873 there was a freshet along the Yellow Breeches Creek in the latter part of the summer—the exact time he could not remember—which "washed away a foot-bridge at a mill known as Ditler's Mill at that time, and also the Red Bridge up at Heck's;" that he was along the creek at that time for four days, fishing for fish and turtle; that during those four days he was at Drawbaugh's shop once or twice, and then and there saw talking machines. He identified "Exhibit I" as one that he saw there at that time. (Ans. 9-13.)

The rest of his testimony related to other visits and other talking machines.

In contradiction of him, complainants called Samuel M. Emminger (C, Vol. 1, 928), Clerk of the County Commissioners of Cumberland County, who testified that there was no such bridge along Yellow Breeches Creek as the Red Bridge at Heck's; that at the date of his deposition there was no mill in the county known as Ditlow's or Ditler's Mill. (Ans. 6.) He fixes the fact, however, which has been conceded on both sides, in the subsequent stages of the case, that the Ditler's Mill referred to by the witness Hoffman could have been no other than a mill near which several families named Ditlow lived in 1873, and had lived for many years (see Danner D. S.-reb. 405, Ans. 18 and 20, 407, Ans. 40 and 408, Ans. 48 and 49; Mrs. McCleaf, *Id.* 445, Ans. 3-6 and 31-34; J. Ditlow, C, Vol. 1, 959, Ans. 4-6; George Ditlow, *Id.* 2123, Ans.

3–5; J. Evans, *Id.* 975, Ans. 15–17), and which is now owned by Etter and Shanklin, known by the name of Etter and Shanklin's Mill, and is situated a short distance below Milltown. (Ans. 8.)

A very ingenious attempt was made by complainants, by means of this witness, to make it appear to the court that the foot-bridge at Etter and Shanklin's Mill was not carried away by the freshet of 1873. The witness was a clerk to the County Commissioners, and produced and read as a part of his deposition a statement which he claimed to have written out from the records of the county, and which was ostensibly a full account of the damage done to, rebuilding and repairs of, all the bridges across the Yellow Breeches Creek from its mouth to a point twenty miles (by stream) above Eberly's Mills, from 1860 down to the date of his deposition.

In it he set forth (Ans. 6) that the foot-bridge at Etter and Shanklin's Mill "was carried away by the ice and high water in the spring of 1875. Not long afterwards a petition was filed in the Court of Cumberland County for a wagon bridge at that place. The bridge was not built, and the foot-bridge was rebuilt in the winter of 1877–8, when the foot-bridge at Liberty Forge, which was removed on account of the new wagon bridge, was carried to Etter and Shanklin's Mill and put up. That bridge is still standing."

The statement contained no allusion to any other time when the Etter and Shanklin foot-bridge was either destroyed or damaged, rebuilt or repaired. He testified that the petition spoken of in his statement was "started" soon after the foot-bridge was carried away, and was presented to the court at the August sessions of the same year. A certified copy of said petition was produced and spread upon the record as a part of his deposition, which showed that the petition was filed August 23, 1875, and viewers were appointed by the Court August 25, 1875.

The inference naturally to be drawn from this testimony, and the one which undoubtedly complainants intended the court to draw, was that the foot-bridge referred to was not washed away, rebuilt or repaired at any other time than that stated. Upon cross-examination, however, the witness admitted that the county had nothing to do with it, and that the records in his office related only to county bridges (*i. e.*, large wagon bridges too expensive for townships to build or keep in repair), and did not show anything with regard to township bridges; and further (Ans. 36), that "the county does not build foot-bridges; they are built by the township or by the citizens of the localities where they are erected."

Complainants followed up this testimony by calling Jacob Evans (C. Vol. 1, p. 974), who testified that he began to work at Etter & Shanklin's mill on the 1st of November, 1874 (Ans. 15), and worked there until some time in September, 1875, when he moved away (Ans. 19); that during the winter he worked there (1874-75) the foot-bridge was taken away by high water and ice. (Ans. 20.)

To meet the inferences which complainants undoubtedly intended to draw from this testimony, and to demonstrate that the witness Hoffman was correct in the date which he fixed, as well as to show to the Court the flagrancy of this attempt to make the truth appear a lie, and to furnish another illustration of the peculiar methods pursued by the complainants in attempting to answer defendant's proofs, defendants called a large number of witnesses.

It must be here remarked, that in order to relieve complainants of suspicion of having acted in bad faith with the Court, and boldly attempted to practice deceit upon it, it is necessary to assume their entire ignorance of the law respecting the re-building and repairing of foot-bridges—ignorance which would have been dispelled by inquiry of any intelligent citizen of any of the rural districts of Pennsylvania. And, moreover, however ignorant complainant's counsel may themselves have been on the subject, it is clear that their chosen confidential agent and procurer of evidence, John C. Comfort, could not have been so, inasmuch as he resided in Lower Allen township, as appears by the evidence, and on the very banks of the Yellow Breeches Creek (see map in complainant's book of exhibits), and is shown to have hauled timber under Supervisor Weaver (C, Vol. 3, p. 1920), for the repair of one of the foot-bridges across said creek; and to have held office at one time in said township (D, Vol. 1. 315). Furthermore, the duty of the township supervisors to repair foot-bridges was subsequently proved by complainants, when in their rejoinder it became necessary for them to shift their ground. (D. Smith, C, Vol. 3, 1895–6, Ans. 9–11, *et passim*; Bilner, *id.*, 1929–30, Ans 3, *et passim;* Eshelman, *id.*, 1943, Ans. 5.) The same appears by numerous other witnesses called by both complainants and respondents. It also appears that a territorial division of the work on roads and bridges, in Lower Allen township, Cumberland county, is made between the two supervisors, the districts being known as the "upper" and "lower" "ends." (D. Weaver, *ut supra;* Bitner, *id.;* Eschelman, *id.:* H. S. Rupp; D. S rej., 228, *et seq.*, and others.)

A few words are necessary with regard to the *locus in quo.* The Yellow Breeches Creek, the course of which is exceedingly tortuous for a considerable distance, forms the boundary line between Cumberland and York Counties, Pennsylvania, and empties into the Susquehanna River at New Cumberland, a few miles below Eberly's Mills. On its northern bank, at the mouth of Cedar Run, stands the shop of Daniel Drawbaugh. The creek is crossed by numerious wagon and foot bridges, the character and location of which are stated with substantial accuracy by complainant's witness, Emminger (C. Vol. 1, 930–1, Ans. 6). Of the wagon bridges it is unnecessary to speak. Of the foot-bridges we have to do with five, which in 1873 connected Lower Allen township, Cumberland County, with Fairview township, York County, in the following order, beginning with the lowest down: First, that at Etter & Shanklin's mill, ¼ (Maglaughlin, D. S.-reb., 741, Ans. 11) to ½ (Emminger, *ut supra*) of a mile below Eberly's Mills. Second, Zinn's clover mill, about four miles by road and eight by stream, above the same place (Emminger, *ut supra*). Third, Zinn's fulling mill. Fourth, Liberty Forge. All of these were below the town of Lisburn, which stands on the Cumberland bank of the creek about six miles by road, and, probably, over twice as far by stream above Eberly's Mills; and, fifth, the Andersontown crossing.

The map of the vicinity of Eberly's Mill, contained in complainants' book of exhibits, shows the course of the creek from Zinn's clover mill to its mouth. It appears throughout the testimony that the clover mill, fulling mill, forge and Andersontown foot-bridges were included in the "upper end" (of supervisors' district) of Lower Allen township, Cumberland County, and that the Etter and Shanklin foot-bridge was in the "lower end." A similar division, both of territory and foot-bridges, was made in Fairview township, York County.

THE FLOOD OF AUGUST, 1873.

If there is one thing in this case established more unquestionably and overwhelmingly than all others, it is that there was a freshet or flood along the Yellow Breeches Creek in August, 1873. The contemporaneous newspaper accounts (D. S.-reb., 348–360) show that during the week preceding Monday, August 18, extraordinarily heavy rains prevailed throughout the entire Middle States, swelling the streams, sweeping away bridges and railroad tracks, and causing landslides, destruction of crops and general devastation. In the neighborhood of Harrisburg (about two miles from the mouth of the Yellow Breeches) the rain was unprecedented. The *Daily Telegraph* of that city of Friday evening, August 15th, contains the following:

"*High Water.*

The late heavy rains have swollen the mountain streams much beyond their usual limits, and considerable damage has been sustained by those living in the low lands. The Yellow Breeches, Conodoguinet (also a Cumberland county stream), and other creeks have been on the rampage for the last forty-eight hours, sweeping away fences and bridges, and filling the Susquehanna with floating debris and driftwood. We learn that some injury has been sustained by the lower dam of Mosser and Shoop, at the mouth of the Yellow Breeches, but the exact extent of the injury we have not yet been able to learn. The Susquehanna is about 12 feet above low water mark and is still rising."

And of Monday evening, August 18th, the following:

"*The Rain.*

Six and a quarter inches of rain fell in this city between Monday of last week and noon to-day; this quantity is unprecedented for so short a time, as the average yearly fall is from eleven to twelve inches."

However, the proof that the effects of these violent rain storms extended to the Yellow Breeches Creek and caused a heavy rise in it, does not rest upon mere newspaper reports, but upon the positive testimony of upwards of thirty witnesses called by the defendants in rebuttal. Into the details of their testimony it is unnecessary to enter, in view of the admission of the complainants. It is sufficient to point out that the flood was a very extraordinary one for that creek. Charles I. Boyer testifies that he took charge of Liberty Forge, on the banks of that creek, in 1872, and was there from that time to the date of his deposition (November 7, 1883), with the exception of less than a year (April, 1877, to February, 1878), and that during that time the water in the creek was never so high to his knowledge as it was in August, 1873 (D. S-reb. 206, Ans. 2, 31 and 35–36). Samuel M. Deckman testifies that the creek has never been as high as in August, 1873, since he moved to it in March, 1873 (*Id.* 248, Ans. 9–11); Jacob Kunkel, since he moved there in 1868 (*Id.* 252, Ans. 2); John F. Wire, for eighteen years (*Id.* 274, Ans. 18–20); Barbara Ann Wire, since she was married, in 1868 (*Id.* 278, Ans. 16–17); John Sprenkell, that he has lived within sight of the creek since 1851 or 1852 (*Id.* 281, Ans. 2), and that, except the flood of 1863, the watermelon flood (1873) has been the greatest flood in that time (Ans. 4–8); Isaac Gray, that the flood of August, 1873, was the highest, so far as he can recollect, in thirty-two years, during which time he has lived along the creek. Besides the extraordinary character of it, another fact serves to impress the flood of August, 1873, upon the memory of many of the witnesses, namely, that its rising waters swept away a large number of watermelons from the patch belonging to George S. Sipe and John F. Wire on "Kunkel's Island," on the Yellow Breeches Creek, at Lisburn (Boyer, *Id.* 207, Ans. 22; Deckman, *Id.* 248, Ans. 12, 13, and 20, 21; Kunkel, *Id.* 252, Ans. 3–12; Sipe, *Id.* 267, Ans. 5–12; Mrs. Sipe, *Id.* 272, Ans. 11, 12; Wire, *Id.* 274, Ans. 8–13; Mrs. Wire, *Id.* 278, Ans. 9–14; Atticks, *Id.* 300, Ans. 6, 7; Gher, *Id.* 318, Ans. 8–27; Grissinger, *Id.* 388, Ans. 7, 11, 15, 16;

Hart, *Id.* 394, Ans. 13–17, and many others). These melons were seen and caught at various points along the creek (Boyer, *Id.* 211, Ans. 51; Deckman, *Id.* 248, Ans. 12; Kunkel, *Id.* 253, Ans. 12; Martin, *Id.* 308, Ans. 8–11; Grissinger, *Id.* 388, Ans. 11; Hart, *Id.* 394, Ans. 13, and others), and gave to the flood the name of "the watermelon flood." (Boyer, *Id.* 211, Ans. 47–50; Kunkel, *Id.* 253, Ans. 4, 5; Atticks, *Id.* 300, Ans. 1; Martin, *Id.* 308, Ans. 5, 6, and others.)

In the face of this great array of evidence, complainants were forced, upon the record, to "formally admit that there was a flood along the Yellow Breeches Creek in August, 1873, and that that flood carried away some of Sipe and Wire's watermelons" (C. Vol. 3, top of p. 1925); not, however, until additional evidence had been drawn on cross-examination from their own witnesses in rejoinder (D. Smith, C. Vol. 3, 1901, Ans. 46–51, and 1904, Ans. 64–71; D. Weaver, *Id.* 1924, Ans. 48–50).

THE ETTER AND SHANKLIN FOOT-BRIDGE.

The witness Hoffman testifies that the foot-bridge at Ditler's, or, which we have seen to be the same, Etter and Shanklin's Mill, was washed away by the freshet of 1873, but does not say how much of it.

David Spangler, who lived from April, 1873, to April, 1875, upon what is known as the Studebaker farm (D. Spangler, D. S.-reb. 425, Ans. 1–6 and 21–23; H. Miller, *Id.* 441, Ans. 2–11; Mrs. E. Spangler, *Id.* 452, Ans. 2–5; D. Spangler, Jr., *Id.* 454, Ans. 2–3), which lay along the Yellow Breeches on the York County side, at the Etter and Shanklin foot-bridge, the farm building being close to the bridge (D. Spangler, Ans. 6), and the dwelling-house only about two hundred yards from it (H. Miller, Ans. 12), testifies that while he lived there said bridge was twice damaged—once entirely swept away—in February, 1875, and at another time partially carried away, the latter occasion being "*in the after part of the summer—after harvest*" (which in that neighborhood occurs in July)—when the York County end was carried away (Ans. 8–10). He further explains that the end referred to was the inclined platform (Ans. 18–21), which rested partly on land and partly on trestles. (*Id.* and H. Miller, *Id.*

443, Ans. 21; D. Spangler, Jr., *Id.* 454, Ans. 20, and others.)

Henry Miller, who lived with Spangler during the entire two years he was at the Studebaker farm, testifies to the same effect (*Id.* 442, Ans. 15-24), and further, that the York County end, the length of which, according to his recollection, was about sixty feet (Ans. 20), was carried away *by a flood*, which occurred in August, 1873, and that when the bridge was carried away in February, 1875, the damage was done *by ice*.

Mrs. Elizabeth Spangler, who lived in his family from May or June, 1873, to March 4, 1875, and who was married to his son, D. Spangler, Jr., in October, 1874, testifies that the platform at the York County end was carried away *by water* in 1873—"in the fall, some time—some time after harvest; I could not tell you the exact time;"—and the whole bridge by ice in the spring of 1875. "It was some time that spring, before I had moved away" (Ans. 6-9). She further testifies that she had occasion to cross that foot-bridge frequently (Ans. 10), and that Mr. Spangler replaced the lost platform a few days after it was carried away by a temporary plank walk. (Ans. 11-13.)

Her husband, David Spangler, Jr., testifies that he lived with his father on the Studebaker farm from the time the latter moved there, in April, 1873, until the beginning of March, 1875, moving away with his wife about a month before his father did; that during that time the Etter and Shanklin foot-bridge was twice damaged, first, "in the fall of 1873, by water," *Id.* 455 (Ans. 14). "It was some time in August (Ans. 15) when the York County end, which, according to his recollection, was about 50 feet in length (Ans. 19), was swept away, and the Cumberland end swung around" (Ans. 16-18). And afterwards in February, 1875, by ice (Ans. 24) entirely carried away.

Amos Zimmerman, who lived along the creek on the next farm below the Studebaker farm, testifies that York County end or platform of the Etter and Shanklin bridge was torn away by *high water*, in the middle of August, 1873 (*Id.* 450 Ans. 8-14), and that the bridge was subsequently carried away *by ice* in 1875, about the latter part of February. (Ans. 15-16.)

There certainly can be no pretense that these witnesses have confounded the ice flood of February, 1875, with the freshet or flood of August, 1873. They remember both, and distinguish accurately between them, both as to the character of the floods and the damage done to the bridge by them.

Mrs. Annie McCleaf, whose maiden name was Ditlow, and who lived close by Etter & Shanklin's Mill up to the spring of 1875, testifies that a flood in August, 1873, "took a part of the bridge away, to the first pier on the York County side." (*Id.* 446, ans. 12–15.)

Several other witnesses testified from their own personal observation that the Etter & Shanklin bridge was gone in August, 1873, to wit: Danner (*Id.* 402) and Solomon Zimmerman (*Id.* 421), but as their recollection seems to be at fault with regard to the extent of the damage, we do not think it proper to rely upon them. Although they testify clearly enough as to the fact that the bridge was carried away in August, 1873, yet they have probably confounded the extent of the damage done at that time with the damage done at some other time,—probably in 1875.

That the bridge was carried away in August, 1873, was a well-known fact in the community, and a number of witnesses testify that they heard it talked about at that time. (Samuel M. Deckman *Id.* 249, Ans. 17 and 30–33; Mrs. Ellen Shaffer, *Id.* 295, Ans. 13 and 31; Atticks, *Id.* 301, Ans. 11, 12; Snell, *Id.* 415, Ans. 31, 32; Grissinger, *Id.* 388, Ans. 14; W. W. Hart, *Id.* 395, Ans. 18–20; Anderson, *Id.* 535, ans. 13.)

William W. Hart worked as farm-hand for Jeremiah Grissinger during the year 1873 (Grisinger, *Id.* 387, Ans. 5–7; Hart, *Id.* 394, ans. 5–7), and at the time of the watermelon flood (Grissinger, Ans. 8–12; Hart, Ans. 13), which Hart fixes as in August, 1873 (Ans. 9 and 20), they went together to the Yellow Breeches Creek, to a point about a mile below Etter & Shanklin's Mill, and whilst there saw a part of a foot-bridge floating down the creek (Grissinger Ans. 11; Hart, Ans. 13). Grissinger says it was about one-third of a foot-bridge. (Ans. 17.)

Henry Anderson testifies that a part of a foot-bridge came down the creek on the August, 1873, flood—the date of which he fixes by book entries—and lodged on his bottom land (*Id.*, 535, Ans. 11), on the York County side, about a mile above New Cumberland (Ans. 4); and that "Charles Sweeney, the supervisor, came to me and told me that it was a part of a foot-bridge that had been swept away up around Milltown, or in there somewhere, and he would take it away, or would have to take it away, to fix the bridge up with." (Ans. 13.)

The Etter and Shanklin foot-bridge was the only foot-bridge across the Yellow Breeches Creek in Sweeney's district, inasmuch as there were none below it (see Emminger, Ans. 6), and the next above, at Zinn's clover mill, was in the district of Adam Baker. (D. Smith, C. Vol. 3, 1896, Ans. 11; D. Weaver, *Id.*, 1919, Ans. 10, 11.) That Charles Sweeney and Adam Baker were supervisors of Fairview township in 1873 (see *Id.*, *p.* 2080), and that Sweeney is now dead. (See statement of complainants' counsel, *Id.*, *p.* 2081.)

Henry S. Magonell testifies that he helped Charles Sweeney, the supervisor, to repair the Etter and Shanklin foot-bridge in September or October, 1873 (D. S.-reb, 964, Ans. 2-10) that the part of the bridge repairkd was the York County end, about fifty-five or sixty feet long, which had been carried away by high water in August, 1873 (Ans. 12-16); that witness was married November 3, 1873 (Ans. 6), and the repairing was done just before that event occurred (Ans. 5), and when fall wheat was very nicely up (Ans. 22); and that, with the exception of a few new boards, they used old lumber—or stems and boards—which had been in the bridge before (Ans. 17-21); and, further, that a temporary plank platform had been put up before the repairing was done. (Ans. 47.)

He is corroborated by George W. Atticks, who testifies (*id.*, 302, ans. 12) as follows: "Charles Sweeney was supervisor that year (1873) of our township, or rather that end of it which the bridge belonged to. In the fall, I think it was in November, he asked me to help put up this bridge at Etter and Shanklin's"; and by David Spangler, Jr., who testifies that the bridge was repaired "between the time it was swept away and the holidays." (*Id.*, p. 455, Ans. 21.)

Moreover, not only did defendants show that a part of the Etter and Shanklin foot-bridge was carried away by the flood of August, 1873, but they proved by persons who were present with him, that E. B. Hoffman was present at the foot-bridge at the time when the accident happened.

William J. Maglaughlin testifies that in August, 1873, he, his son Jacob J. Maglaughlin (Ans. 15, 16), and E. B. Hoffman went together on a fishing expedition along the Yellow Breeches Creek (*id.*, 751, Ans. 1-7) to catch fish and turtles (752, Ans. 18); that they encamped along the Yellow Breeches Creek opposite the Studebaker farm, and just below the Etter and Shanklin Mill (Ans. 10), from Monday dinner-time until Friday morning (Ans. 17), during which time the creek rose very high. "It rose high enough to bring down all the wood and stuff that was lying along the creek; it fetched down one foot-bridge that I seen, and part of another." (Ans. 9.) "There was a big tree and a foot-bridge coming down over the dam, and *we could see them from where we were encamped.* I think it was striking the foot-bridge at Shanklin's Mill that caused one-half of that to go, because it went just after it was under it. I can't tell what foot-bridge the other was, as I can't tell where it came from, but it came down the creek." (Ans. 12.) "Q. 13. What part of the foot-bridge at Etter and Shanklin's Mill, or Shanklin's Mill, as you call it, was carried away at that time? Ans. It was the half on the left hand side of the creek going up, on the York county side—right at the Studebaker farm." He further testifies that he never went up the creek with Hoffman at any other time, as it was very seldom that the latter could get off. (Ans. 31.)

Jacob J. McLaughlin (*id.* 763) fully corroborates his father. He testifies to the fishing expedition along the Yellow Breeches Creek with Hoffman in 1873, and although he cannot name the month, he fixes the time time with sufficient definiteness by the fact that the corn was in roasting ears at the time (*id.* 765, Ans. 18). He testifies that the party encamped just below the flouring mill and the foot-bridge (Ans. 11), and that he saw "part of the foot-bridge that was right below the flour mill taken away by part of another foot-bridge that came down from some place" (Ans. 16). He further testifies that he never went fishing on the Yellow Breeches after 1873. (Ans. 24.)

To this testimony with regard to the carrying away and repairing of the Etter and Shanklin foot-bridge, the complainants attempted no reply beyond a superficial attack upon a statement made by one of defendant's witnesses, Amos Zimmerman, with regard to the time when the repairs were made.

But we are not quite done with the testimony of William J. Maglaughlin. He further testifies that whilst he and Hoffman were thus encamped at Etter and Shanklin's mill, they went together to Drawbaugh's shop to get a net with which to catch bait fish (*id.* 752, Ans. 19–22), and that Drawbaugh then and there showed them and talked to them through his talking machines (Ans. 22–25), and the witness identifies "Exhibit I," as one of the instruments which he saw there at that time. (Ans. 26.)

Thus, then, the defendants proved: 1st, that there was a flood or freshet along the Yellow Breeches Creek, on August 18, '73; 2d, that the witness, Hoffman, was there at the time; 3d, that the foot-bridge (or at least a part of it) at Etter and Shanklin's (or Ditler's) mill was washed away by said flood; as was, 4th, another bridge; 5th, that Hoffman was at Daniel Drawbaugh's shop, and saw talking machines there, at the time of said flood, and 6th, among which was "Exhibit I."

This was certainly as complete and satisfactory a vindication of the accuracy of the memory of Hoffman as could be desired. But we have not yet exhausted defendant's proofs.

OTHER BRIDGES.

It may be admitted that Hoffman was in error in regard to the "red bridge up at Heck's." But it must be noted that he does not pretend to have any personal knowledge of the carrying away of any such bridge. He merely states that his visit to Drawbaugh's shop was at the time of a freshet, which carried away said bridge, without, however, claiming to have been present *when* it was carried away, or to have been at its former site *after-*

wards, or, indeed, to have any personal knowledge of its location. The very fact of his having called the Etter and Shanklin mill by a name by which it was *not* commonly known, as he supposed, demonstrates his unfamiliarity with the names of localities along the creek. The flood was an extraordinary one, and great damage was done by it; bridges were swept away to his personal knowledge; several bridges above Etter and Shanklin's were reported to have been carried away, and were actually carried away, as will appear further on. These reports Hoffman may have heard at the time, and in what exaggerated form it is impossible to tell. So that it is easy to see how he may have been wrong with regard to the "red bridge up at Heck's," without detracting anything from the general accuracy of his memory or the honesty of his testimony.

We will now discuss as briefly as possible the testimony in the case bearing on the carrying away of bridges above Etter and Shanklin's mill.

1, *The Andersontown Foot-bridge.* — The foot-bridge highest up the creek, with which we have to do, at the Andersontown fording was in 1873, about three-quarters of a mile above Lisburn. (J. F. Wire, D. S.-reb. 277, Ans. 53.)

Mrs. Barbara Ann Wire testifies that a couple of days after the flood which carried away the watermelons belonging to her husband and George S. Sipe (*id.* 279, Ans. 22), and which she fixes as in August, 1873 (Ans. 7–13), she started to visit some friends living at Siddonstown (Ans. 31–34), and when she went down to the creek to cross "the bridge above Lisburn, toward Andersontown," it was gone. (Ans. 20-21.)

John F. Wire testifies that the flood of August, 1873, which took away his watermelons, also carried away the foot-bridge at the Andersontown fording, above Lisburn (*id.* 275, Ans. 22–24). He does not state his means of knowledge, but it is highly probable that he had personal knowledge of it, as the bridge was only "about half a mile" from his house. (Ans. 54). George W. Atticks corroborates. (*Id.* 301, Ans. 11.)

This bridge could not have been carried away later than 1873, as in that year a wagon-bridge was built to replace it (Emminger, C. Vol. 1, 931; Atticks, D. S.-reb., 304, Ans. 32); and it is submitted as highly probable, although there is no evidence in the case bearing direct on the point, that the wagon-bridge was built in that year *because* the foot-bridge had been washed away, the attention of those residing in the vicinity of the bridge being thus drawn afresh to the need of a substantial and permanent crossing at that point, just as the carrying away of the Etter and Shanklin's foot-bridge by the ice flood of 1875 led to the circulation among the neighhors and the presentation to the court of a petition asking for a county bridge at that point.

The testimony of the defendants with regard to the carrying away of the Andersontown foot-bridge in August, 1873, is entirely uncontradicted, the general denial of the Supervisor, Bitner, being rendered inapplicable to it by the fact of the building of the county bridge with which he had nothing to do in the same year.

2. *Liberty Forge Foot-bridge.* The next foot-bridge, down the creek, in 1873, was that at Liberty Forge. The testimony regarding it was as follows:

George W. Atticks, referring to the watermelon flood of 1873, which he had special reason to remember, and the date of which he fixes with great positiveness and accuracy (D. S.-reb., 300. Ans. 1-8), testifies (Ans. 10), "yes, sir, it did take away foot-bridges; it carried away the clover mill, the fulling mill, and the forge foot-bridges to my own knowledge—my own sight—meaning that I seen them after they were carried away. I didn't see the water carrying them away; I seen the places where they were, rather."

To contradict this testimony, complainants called two witnesses:

(*a*) Charles I. Boyer, who is unwilling to say positively that the flood of August, 1873, did not carry away the forge foot-bridge, but testifies merely, "I think it did not" (C. Vol. 3, 1942, Ans. 3). Whether this is evidence at all seems at least very doubtful, but certainly no probative force can attach to it when opposed to the testimony of a witness who swears to his own positive knowledge.

(*b*) Jacob E. Mumma, who testified that he lived for seven years, beginning April, 1873, at the Liberty Forge, being one of its proprietors, and that during that time the foot-bridge there was carried away only once, to wit: in 1877. (C. Vol. 3, 2001, Ans. 1, 9.) But his testimony is rendered worthless, as he goes to pieces on cross-examination, both as to dates and events. He fails entirely to remember that there was a flood in August, 1873 (Ans. 21), or the watermelon flood (Ans. 46), or that Sipe and Wise's watermelons were ever carried away by any flood (Ans. 49-51), or that there ever was an ice flood along the creek whilst he lived at the forge (Ans. 52). These were facts well known in his neighborhood, and testified to by both defendants' and complainants' witnesses, and that he should not remember them demonstrates untrustworthiness of his memory. He testifies, however, that he does remember a flood in 1873, which he has reason to remember was "before harvest—in the fore part of the summer" (Ans. 10-18, 21, 22); he does not remember that it did any damage along the creek, and it did not do any at the forge (Ans. 18). He admits that there may have been another flood that year, but does not recollect it (Ans. 23). He does not appear to have been in the habit of crossing the creek at the forge foot-bridge (Ans. 33-44), his post-office being at Lisburn (on the same side of the creek as that on which he lived), where also he purchased his household supplies (Ans. 37-39); and when he had occasion to drive across the creek, he usually crossed at Lisburn by the wagon-bridge. (Ans. 41-44.)

4. *Zinn's Fulling Mill foot-bridge.*

George S. Sipe testifies that a couple of days after the flood which carried away his watermelons (D. S.-reb. 268, Ans. 18) which he fixes as a week or ten days after he quit work at the forge (Ans. 6-7). He quit August 5, 1873. (See Boyer *Id.* 207, Ans. 13 and entry on Boyer's time book *Id.* 210): that he had an errand down the creek and went to Zinn's falling mill, intending to cross the creek by the foot-bridge, but could not do as the bridge was gone (Ans. 15-18), and he was compelled to cross by wading "right at the place where the bridge had left—at the fulling mill" (Ans. 41, 42). That this must have occurred in warm weather is reasonably certain, and that it could not have occurred after 1873 is

Third—That David Smith, who is not shown to have any special means of knowledge, does not remember that the bridge was carried away in 1873. (*Id.*, 1899, Ans. 35.)

No further contradiction or impeachment of defendants' witnesses with regard to this bridge was attempted, except by the general statement of Henry M. Bitner with regard to all of the bridges in the "Upper End" of Lower Allen township, which statement will be discussed hereafter.

4. *Zinn's Clover Mill Foot-bridge.*—By far the greatest amount of testimony taken respecting the bridges related to this foot-bridge, which was the next above Eberly's Mills and the Etter and Shanklin mill. We will find it most convenient to consider this testimony in the following order, namely: testimony of (*a*) defendants on sur-rebuttal, (*b*) complainants in rejoinder, and (*c*) of defendants in sur-rejoinder,—first premising a few explanations with regard to the location of the bridge and the residences of some of the witnesses.

On the map of the vicinity of Eberly's mills, contained in complainants' book of exhibits, Zinn's clover mill appears. It is the building marked "Clover Mill," highest up the creek shown on said map, and stands on the west bank of the same, near several buildings marked "A Zinn."

The foot-bridge is not shown on the map, but it stood in 1873 and stands to-day a very short distance below the clover mill, and between the road which appears to cross the creek and the road which does *not appear* to, but in point of fact *does*, cross the creek.

Following the course of the stream, these houses appear on the Cumberland bank, namely: First, A. Zinn, occupied in 1873 by Adam Henry Zinn (Hess, D. S-rej., 61, Ans. 41). Second, Dr. Whitman, occupied in 1873 by Samuel M. Deckman (*Id.*, Ans. 40, and Deckman, *Id.*, 83, Ans. 37). Third, "E. Worley," occupied in the same year by Ezekiel Worley, opposite which is a point in the creek known as "Worley's Ripples" (Deckman, *Id.*, 17, Ans. 80). Below Worley's and around the bend of the stream on the York County bank, at the point where the road crosses the creek, by a bridge, is Miller's mill, at which, during the summer of 1873, lived Samuel C. Weber (Weber, *Id.*, 148, Ans. 1–3). Still farther down, but on the Cumberland County bank, is the house of John C. Comfort, the confidential agent of and procurer of evidence for the complainants below.

South of Miller's mill, and in a straight line between it and the clover mill, is a house marked "C. Hess," occupied in 1873 by Peter Hess (Hess, *Id.* 59, Ans. 7); directly west of which, and on the same road with it, is a house marked "Jas." or "Jac. W. Moser," occupied in 1873 by Jacob W. Moser (Hess, *Id.*, 60, Ans. 35). The house south of the last-named and marked "H. G. Moser," was occupied during the same year by Jacob Collins. (*Id.*, Ans. 38.)

It is well to keep in mind these names and localities, as they are referred to more or less frequently, and a knowledge of them will enable us to better understand the force of the testimony.

(*a.*) *Testimony of defendants in sur-rebuttal:*

Samuel M. Deckman moved to the place on the Cumberland bank of the Yellow Breeches (marked on complainants' map "Dr. Whitman"), March 4, 1873, which date he positively fixes by the deed of conveyance which he received for said place (S.-reb. 248, Ans. 7–9; see also Hess D. S.-rej. 60, Ans. 40). He testifies that between the latter part of July and the 15th of August of said year, the watermelon flood occurred (Deckman S.-reb. 258, Ans. 10–14). After giving the details of the flood at some length, he testifies further that it took away one-half of the clover mill bridge (Ans. 17); [This he further explains in his subsequent deposition in sur-rejoinder, in which he gives fuller details]; and that he had occasiod to visit the site of the bridge directly after the freshet. (Ans. 36.)

"*Question* 42. When you were at Zinn's clover mill immediately after the flood of 1873, did you notice that the foot-bridge had been carried away?

"*Ans.* Yes, sir; that is what I had went for. I was told by my nearest neighbor, Andrew Shell—now dead and gone—that the half of the bridge had been carried away, and I went up to see."

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George W. Atticks testifies, after fixing the date of the watermelon flood, that he was at the site of the clover mill bridge after the flood, and saw that it was gone. (See Ans. 10, cited above, in connection with the forge foot-bridge.)

Mrs. Ellen Shaffer, a daughter of Andrew Shell (*Id.* 294, Ans. 2), who lived in 1873, near the clover mill in Cumberland County, not far from the creek (see supra and also map), whilst she lived two miles away, on the York County side of the creek (Ans. 8–18), testifies that she was in the habit of visiting her parents about every two weeks (Ans. 19 and 21), crossing the creek at the clover mill bridge; that she visited home about a week after the watermelon flood (Ans. 21, 22), and had to be taken across the creek in a boat by her father (Ans. 23), because the bridge at the clover mill was gone (Ans. 26). That it was gone she does not testify from mere rumor, but from personal observation (Ans. 70). She does not remember how long it was down, but when it was rebuilt she used it again (Ans. 27–29), crossing by boat only so long as the bridge was down. (Ans. 30.)

Isaac Gray, who lived about half a mile above the clover mill, between it and the fulling mill, at a point not shown on the map, testifies that the watermelon flood, the the date of which he fixes as in August, 1873, carried away the clover mill foot-bridge (*Id.* 311, Ans. 9), and that he went to the site of the bridge an evening or two after it was carried away, and saw that it was gone (Ans. 55-59), although he cannot remember the exact extent of the damage. (Ans. 58, 59.)

James Shaffer (*Id.* 284) testifies that the clover mill bridge was carried away by the watermelon flood in 1873 (Ans. 7), and remained down until May or June, 1874, when it was rebuilt by boss David Smith, John Greenfield being one of the laborers, and witness himself assisting. (Cross-ans. 44, 45 and 88–90.)

That witness was right with regard to the carrying away of the bridge in 1873, is abundantly shown by the testimony of the witnesses above cited, and was overwhelmingly shown by defendants in sur-rejoinder, but it is quite apparent that, with regard to the repairs of the bridge, he confounded different floods.

Jeremiah Grissinger testifies that at the time of the watermelon flood it was reported that the clover mill bridge was carried away by said flood. (*Id.* 388, Ans. 14.)

(*b.*) *Complainants' testimony in rejoinder.*

To this testimony the complainants replied *first* by attacking the date fixed by James Shaffer for the repairing of the bridge. They showed by a numher of witnesses (D. Smith, C. Vol. 3, 1894; D. Weaver, *Id.* 1917; A. H. Zinn, *Id.* 1955; W. Umbergher, *Id.* 1951; John Greenfield, 2014, and John Macallister, *Id.* 2082), that the repairing concerning which Shaffer testified, and in which Smith and Greenfield took part, was done in June, 1875, the bridge having been taken away the previous spring by the ice flood. Attention must be here called to the somewhat adroit but certainly unfair attempt to induce the Court to believe that defendants had set up the theory that the clover mill bridge, after being carried away by the August, 1873, flood, was not repaired until it was repaired by Smith and Greenfield, as follows: C. Vol. 3, 1961, A. H. Zinn.

"Q. 53. It has been suggested that that bridge was carried away in August, 1873, and was down until David Smith and John Greenfield put it up at the time you sent James Shaffer to help them; is that the fact or not?" And *Id.* 1975, W. Umberger.

"Q. 12. It has been alleged that the Zinn bridge was carried away by high water in the summer of 1873, and staid down until it was put up by Daniel Weaver and David Smith; is that the fact or not?"

No such thing has been alleged or suggested by any one except James Shaffer, and by him only in reply to questions put to him by complainants' counsel on cross-examination. It is of no great importance, but it illustrates the characteristic want of candor prevading the whole of complainants' proofs.

Second, by calling three negative witnesses:

(*a*) David Smith. (*Id.*, 1899.)

"Q. 35. It has been alleged that Zinn's clover mill bridge and Zinn's fulling mill bridge were carried away by a flood in August, 1873. Do you remember any such occurrence?" "A. No, sir." A mere want of recollection; and, besides, it is not shown that the witness had any special opportunities for knowing whether or not they were carried away in that year.

But they succeeded no better with

(*b*) A. H. Zinn. (*Id.*, 1961.)

"Q. 52. It has been suggested that that bridge was carried away in August, 1873, and was down during a considerable portion of that summer and fall; is that the fact or not?"

"A. No, sir."

* * * * * * * *

"C. Q. 103. I suppose you don't remember any flood in the Yellow Breeches Creek in the year 1873?"

"A. No, sir."

* * * * * * * *

"C. Q. 107. Counsel for complainants, in view of the testimony that has been given on the subject, formally admitted upon the record, after cross-question 50 of Daniel Weaver, that there was a flood on the Yellow Breeches Creek in August, 1873. Now, will you please explain how it is that although you were living on the banks of the creek, and although you had fields on both sides of the creek, yet you have no recollection whatever of that flood?"

"*A. My memory don't teach me so far back as that, unless I have something particularly to remind me of it.*"

Nor with (*c*) William Umberger. (*Id.*, 1975.)

"Q. 17. It has been alleged that the Zinn bridge was carried away by high water in August, 1873; is that the fact or not?

"A. To the best of my knowledge it was not.

"Q. 19. Could that bridge have been carried away so that people had to cross there in boats, or wade, after the flood went down, without your knowing it?

"A. I think not.

* * * * * * *

"Cross-Q. 43. In direct question 19 you were asked, 'Could that bridge have been carried away, etc., without your knowing it?' and you answered 'I think not.' To what flood had you reference in giving your answer?

"A. To the flood of 1875.

* * * * * * *

"Cross-Q. 107. In your 40th, 41st and 42d answers you say that you saw the clover mill bridge down in the spring of 1875, and also in the spring of 1884; are we to understand that those are the only two years in which you saw that bridge down?

"A. Yes, sir; to the best of my recollection.

"Cross-Q. 108. And you lived in the immediate neighborhood of it how many years?

"All my life, excepting two years; in all about twenty-seven years.

"Cross-Q. 109. I suppose you may have seen it down at times of which you do not recollect, may you not?

"A. Yes, sir; it is possible.

"Cross-Q. 110. And it may have been down whilst you lived near it, at times when you did not know it, may it not?

"A. Yes, sir; it might.

These are fair illustrations of the value of the negative testimony with which complainants have sought to rebut the positive proofs of defendants.

And *third.* By the general denial of the supervisor, Henry M. Bitner, that that bridge was carried away. He predicates this denial upon the fact that he received no notice to put up any foot-bridge over the Yellow Breeches Creek during his term of office.

To fully appreciate the entire worthlessness of the testimony of this witness, it would be necessary to read together his two depositions (1st dep. C. Vol. 3, p. 1929, and 2d dep., *Id.* 2350). For shuffling and evasion, looseness of statement and unreliability of memory, his testimony in this case is unique. It would be impossible, in the compass of a brief, to point out all of the discrepancies and contradictions of this witness, or the instances of his failure to understand or unwillingness to answer in a straightforward manner, questions which would have been plain to an ordinary intellect. It is not necessary to assume, and it is not here assumed, that he gave his testimony with any dishonest intent. He seemed throughout to be possessed with an idea that an attack was being made upon the honesty of his administration of the office of supervisor which must be resisted. In every question he detected a covert thrust which must be parried. It was, therefore, well nigh impossible to get information from him on cross-examination. His constant reply in his second deposition to questions when, where, and by whom certain work was done, being that "his accounts were satisfactory to the auditors and should be so to everybody else." For the statements which he did, when urged by repeated questions, make, he tells us that he relies partly upon his book and partly upon his memory. The book, however, is entirely unreliable. It is not a book of original entries made at the time the work was done. He testifies that the township work on roads and bridges during his term of office was done in the summer (2d dep. Ans. 38, 41, 44, 70; 1st dep. Ans. 61, 62 *et al.*, probably from April to October, if the month dates appearing in the book mean anything). Yet his book bears at the head of each page the year date "1874," and he testifies that the book was not "fixed up" until sometime after January 1, 1874 (2d dep., Ans. 32-37 and 53, all at one time, *Id.* 46, from four to nine months afterward). His custom was to keep the accounts of the hands employed himself, if he happened to be present; if not, to take the accounts given by themselves or "some one person that superintended" (2d dep., Ans. 56, 58, 59, 64). Some of his accounts were kept in writing (they are not produced nor is their absence accounted for), but he does not know that all were (*Id.*, Ans. 60); some of the accounts that were given him by others were in writing, and "some maybe not" (*Id.*, Ans. 68). He does not know whether or not he kept an account in writing of his cash payments. (*Id.* 62.)

After the book was fixed up in writing at the time above referred to, other accounts were handed to him and entered in the book in pencil (*Id.*, Ans. 79). Alterations of figures in the entries appear to have been made (*Id.*, Ans. 88 and 91), and after this fact came out in evidence, complainants' counsel hastened to contradict the witness, who had sworn that John C. Comfort had the book in his possession, by stating upon the record that the witness was "in error; that the book was brought from Mr. Bitner's house by the complainants' counsel and Mr. Comfort together and has been in the personal custody of complainants' counsel, exclusively ever since," evidently anticipating that the court would not form a very exalted opinion of the scrupulous honesty of their confidential agent and traveling companion. The book contains very few dates, and shows nothing as to the various places where work was done, and scarcely anything as to its character.

But the memory of the witness is even more unreliable than his book. This is shown throughout both of his depositions, and no adequate idea of the extent of his forgetfulness can be given except by quoting them entire. He has no recollection at all of the flood of 1873, which must have caused great damage to roads and bridges as well in his district as elsewhere. He recollects very little of the work that was done during his term of office, and even with his book before him, he cannot tell what work particular individuals did, nor where, nor, unless the date appears in his book, when; and as to minuter details his memory is a perfect blank.

The amount which he expended on roads and bridges during his term of office was $786.91, but when asked to look through his book and point out all the items of work at which he recollects of being present and superintending, he is able to remember only two; one item of $15.62 and another of $3.37 (second dep., Ans. 77). He seems, however, to have settled his account with the auditors, and then dismissed from his mind everything connected with the supervisorship. It appears that in 1873 he owned two farms, which occupied much of his time. (First dep., Ans. 51–54.) In his first deposition he declares that he supervised all the work on roads and bridges in the township, *except two or three times*, on wagon bridges over near Lisburn (Ans. 55). "I left very little for others to supervise—very little" (Ans. 74). He says he "supervised nearly all the road-making, both bridge-repairing, filling up mud-holes and opening drains, nearly all of it" (Ans. 75). In his second deposition, however, he admits that it did not suit him to superintend work over about Lisburn (Ans. 58 and 64), and that "a man (Joel Fetrow) superintended a few little odd jobs out there, and Michael Smyser; I don't recollect any others, if I mistake not" (*id.*, Ans. 65). But it appears from witness' book that Joel Fetrow was allowed pay for twenty days (*id.*, Ans. 66–68), or six days more than the supervisor himself. How many days Michael Smyser acted as superintendent or deputy supervisor does not appear, and the witness does not, it will be observed, say with great positiveness that there were no others.

It is quite easy to believe that bridges may have been carried away by the August, 1873, flood, and repaired by deputy supervisors without even the knowledge of Bitner, or, if he did know it at the time, without his recollecting it. If he had personally supervised all of the township work, and had been a man of reliable memory, his failure to remember the repairing of any bridges in 1873 might have been of greater value; but in view of the evidence of defendants in sur-rejoinder, it is entitled to none.

(*c*) *Testimony of defendants in sur-rejoinder.*

So far as regards the flood and bridge controversy the main attack of complainants in rejoinder was on the clover mill bridge. Whether or not it was swept away is not very material in the case. Whether it stood or fell in August, 1873, the witness, Hoffman, is amply corroborated. And with the flood formally admitted, the carrying away of the Etter & Shanklin and Andersontown bridges practically uncontradicted, and the carrying away of the forge and fulling mill bridges but feebly assailed, defendants might have rested, had they not desired to show to the court by evidence so overwhelming and conclusive that complainants would not dare to question it, the entire good faith and truthfulness of defendants' allegations with regard to the carrying away of the clover mill footbridge, and the utter groundlessness of complainants' attempts at denial of them. They, therefore, called a number of persons who were either eye-witnesses of the carrying away of the bridge in August, 1873, or resided in the immediate vicinity of it at that time. The following is an abstract of their testimony:

J. Y. Fetro (D. S.-rej. 2) testifies that he was present on one occasion when the foot-bridge at Zinn's clover mill was carried away by high water (Ans. 4); that George Haring and Frederick Deckman were with him at the time (Ans. 5–8); that they went together down to the creek to see it, having heard that it was high (Ans. 8–9);

that it was in the summer some time, but he cannot fix the year (Ans. 10–11); that he and Haring and Deckman stood near the bridge, and above it (Ans. 12 and 21); at the fording of the wagon road (Cross-ans. 32–33); and saw a tree-top, which had a branch sticking up out of the water, float down the stream, and strike and carry away the foot-bridge. (Ans. 13–19.)

On cross-examination he testifies that there were other folks present at the time, but he cannot remember who they were (Cross-ans. 29). And that it is his recollection that the foot-bridge was rebuilt the same fall that it was carried away (Cross-ans. 95–98).

Frederick Deckman (*id.* 11) testifies that he was present on one occasion in August, toward the last of it (Ans. 14), the year, however, he does not fix, in company with George Haring and John Fetro, when the foot-bridge at Zinn's clover mill was carried away (Ans. 3 and 4). He testifies that he and Haring and Fetro were standing about fifty yards or so from the bridge on the York County side (Ans. 5–7), when they saw a tree-top, or what was between a tree-top and a log (Ans. 11), with a hook on it, float down the creek and pass under the foot-bridge, which was caught and carried away by the hook (Ans. 7–9); that about a month afterwards, as nearly as he can tell, he went to the place of his brother, Samuel M. Deckman, who lived within about three hundred yards of the Yellow Breeches Creek, on the Cumberland County side, and then saw some piers similar to those belonging to the foot-bridge lying on the island at Hess's (Ans. 15–27).

George F. Haring (*id.* 27) testifies that on a certain occasion, about perhaps the last of August or beginning of September (Ans. 18), the year, however, he does not fix, he, John Fetro and Frederick Deckman went together to the Yellow Breeches Creek to see the high water (Ans. 3–7); that whilst they were standing on the York County side, just above the foot-bridge at Zinn's clover mill, they saw a tree upon which was a limb that stuck up, swimming down the creek (Ans. 8–16), and saw the foot-bridge caught and broken by the limb (Ans. 11, 12 and 21), and that the tree and the timbers of the bridge floated down the stream (Ans. 21–24). He remembers of hearing the ice flood talked about at the time it occurred, and thinks that the occasion concerning which he testifies was before the ice flood (Ans. 19, 20 and 27).

Edward P. Springer (*id.* 16), testifies that for ten years prior to 1877 he lived with Jacob K. Shell, who was his guardian, in Fairview township, York County, Pa., about a mile and a half from the foot-bridge at Zinn's clover mill (Ans. 4–8); that in the year 1873, whilst George W. Atticks lived in the tenant-house belonging to Shell, he (Springer) and Atticks owned a boat on the Yellow Breeches Creek, in partnership (Ans. 9–23); that he sold his interest in it to Atticks when the latter moved away from Shell's house (Ans. 15–17); that he never had an interest in any other boat (Ans. 10); that during that year in August, and whilst he and Atticks still owned the boat in partnership, there being a flood along the Yellow Breeches Creek, he went in company with Atticks and Shell to the creek to secure the boat (Ans. 25–29); that after having secured it Atticks went home and witness and Shell went down the creek as far as the foot-bridge at Zinn's clover mill (Ans. 31, 32); that they remained there for some time, and whilst there a tree having a limb or snag on it came down the creek, struck the foot-bridge and lifted it off (Ans. 37–39), and that the bridge and the tree then floated down the creek as far as he could see (Ans. 40); that the talk was, in the neighborhood at the time, that the bridges at the forge, the fulling mill, and Etter and Shanklin's mill were carried away by the same flood (Ans. 50–51).

Jacob K. Shell (*id.* 22) testifies that he has lived in Fairview township, York County, Pa., a mile and a quarter from Zinn's clover mill bridge, since 1852 (Ans. 1, 2); that in August, 1873 (Ans. 21), at the time of the water-melon flood (Ans. 9), whilst George Atticks was living in his (witness') tenant-house, the Yellow Breeches Creek being very high, he went in company with Edward D. Springer and George Atticks to it to secure a boat belonging to Springer and Atticks (Ans. 8–10); that having secured it, he and Springer went down the creek to the clover mill foot-bridge (Ans. 11, 12); that whilst they were at the foot-bridge they saw a tree come down top-foremost, and carry the bridge away (Ans. 15, 16), and bridge and tree went down the creek (Ans. 17) until they were out of sight (Ans. 18). He further testifies that he knew of the foot-bridge at Zinn's clover mill being carried away by the *ice flood*, but that happened a year or so afterwards. (Ans. 23, 24.)

He testifies on cross-examination that his brother, Andrew Shell, was a carpenter, and that, to his knowledge, upon one occasion, when he was not supervisor, he undertook to put up the clover mill bridge after it had been blown down in the dead of winter, and came near being killed by being caught between two logs at the time (Cross-Ans. 26, 27 and 32, 33). He further testifies, that "a lot of us neighbors put it up at that time, and we got our dinner at Adam Zinn's." (P. 25, Ans. 27.)

George W. Atticks (*id.* 35) testifies that he lived in Jacob Shell's house from April, 1873, to April, 1874, when he purchased a property near New Cumberland, and moved on to it. The date he fixes by his book account with Jacob Shell, and by the deed for the property, which he produced (Ans. 2–13); that whilst he lived in Shell's house he owned a boat in partnership with Edward D. Springer (Ans. 14–17), and that he purchased Springer's interest, when he (Atticks) moved away, and carried the boat with him to New Cumberland (Ans. 19, 20); that he has never since that time had any boat in partnership with Springer (Ans. 21); that whilst they had it in partnership they kept it in Yellow Breeches Creek, near Grindstone hill, and at the time of the watermelon flood, concerning which he testified in his former deposition (see D. S.-reb, p. 300), it was at that place (Ans. 22–24); that knowing the creek to be high he and Edward D. Springer went to secure the boat, his impression being that Jacob K. Shell was also along (Ans. 25–27); after having secured it he went home (Ans. 28, 29), and Springer and Shell did not accompany him. (Ans. 30.)

Mrs. Eliza Collins (*id.* 31) testifies that she lived with her husband Jacob Collins in York County, within a stone's throw of the Yellow Breeches Creek (Ans. 7), and 300 yards from Zinn's clover mill foot-bridge (Ans. 5), from 1868 to 1878 (Ans. 3), that during those ten years the foot-bridge was carried away four times, and was once blown down by a storm (Ans. 8); that it was first carried away in March, 1871, on a Sunday afternoon (Ans. 9); next in August, 1873, by high water (Ans. 10); the date she is enabled to fix by the birth of her youngest daughter, who was born June 22, 1873 (Ans. 11, 12);again in the latter part of February, or in March, 1875, by the ice (Ans. 13, 14), and again, the date she cannot give, by the breaking of Lantz's dam (Cross-Ans. 33, 34); and it was blown down by the storm one Sunday in October, but the year she cannot positively fix. (Ans. 40, 41.)

She testifies that the foot-bridge is not in sight from the house because of a grove of trees intervening (Ans. 6), but that it is visible from the spring where she was in the habit of getting water for the house (Ans. 23, 24). She testifies that at the time it was carried away in August, 1873); she did not see it fall, but she saw part of it going down the stream past her house (Ans. 19, 20); that it was taken away by a large tree at that time; that she did not see the tree taking the bridge, but saw the tree floating down the stream with part of the bridge timber. (Ans. 21.)

She further testifies that after being carried away by the in flood of 1875, the bridge was repaired in May or June—before hay-making—(Ans. 15), and that Daniel Weaver was supervisor, and had charge of the repairing (Ans. 16); that after it was carried away in August, 1873, it was put up "the same fall—the same season" (Ans. 17); and that "Mr. Henry Bitner was the supervisor, and Mr. Andy Shell did the work." (Ans. 18.)

Mrs. Adeline Moser (*Id.* 45) testifies that she lived in Fairview township, about a quarter of a mile below Zinn's clover mill foot-bridge for twelve years prior to 1878 (Ans. 1-9), and that she was in the habit of crossing said foot-bridge occasionally (Ans. 22, 23); that on the 14th of April, 1873, the day her daughter was born, Clara Eppley came to live with her, and remained until the next spring (Ans. 15-18); that whilst Clara Eppley was living with her in the summer of 1873, when the corn was up pretty well, there was a flood in the creek which damaged her husband's corn (Ans. 24-29), and which brought down a tree or log which knocked the foot-bridge away

(Ans. 30, 31); that she was told by the nearest neighbors that the bridge was taken away by a tree. (Ans. 44.)

Jacob W. Moser (*Id.* 50) testifies that he formerly lived on the Yellow Breeches Creek near Zinn's clover mill (Ans. 2); that there was a flood along said creek in August, 1873, in roasting-ear time (Ans. 3-6, 10); that Clara Eppley lived in his family at the time (Ans. 8), having come there in the spring of the same year (Ans. 20); that during said flood the foot-bridge at Zinn's clover mill was carried away by a tree or log (Ans. 12, 13). He remembers that said bridge was carried away by the ice flood, which happened about two years after it was carried away by a tree or log (Ans. 14, 15). He produces a book account which shows that Clara Eppley came to live in his family April 14, 1873. (Ans. 20.)

Mrs. Clara Boyer (*Id.* 54) testifies that she began to live with the family of Jacob W. Moser, in Fairview township, York County, Pennsylvania, on the day that their daughter Hattie was born, April 14, 1873, and lived there one year (Ans. 2-5); that whilst she lived there during the summer of 1873 Mr. Moser had a field of corn which was damaged by cattle getting into it, the fence having been washed away that year by a flood (Ans. 10-15); that at that time the foot-bridge at Zinn's clover mill was taken away by a tree, or a part of a tree (Ans. 16, 17); that in 1875 the clover mill bridge was again damaged by an ice flood (Ans. 18), but that she was not living at Jacob Moser's at the time. (Ans. 19, 20.)

She further testifies that her knowledge of the carrying away of the foot-bridge in 1873 was obtained by hearing people speak of it at the time. (Ans. 21.)

Peter Hess (*Id.* 56) testified that he farmed at a place (marked "C. Hess" on complainants' map) belonging to his father, in Fairview township, York County, along the Yellow Breeches Creek (Ans. 2-10), that he took possession of it in the spring of 1873, and continued to farm it until the spring of 1880 (Ans. 9-10); that Hess' Island is situated in the Yellow Breeches Creek, a short distance from, and within sight of, the place where he was accustomed to water his horses (Ans. 12 and 25); that a flood occurred along the Yellow Breeches Creek "in August, or after the 9th of August, 1873" (Ans. 23); that after the water fell, so that he could get down to the creek to water his horses, he noticed lying upon the upper end of said island "a log containing a limb, with a pier or pillar of a foot-log" (Ans. 26-34).

Minnie A. Deckman (*Id.* 63) testifies that she is a daughter of Samuel M. Deckman, and moved with him, where he now lives, on the 4th of March, 1873 (Ans. 1-3); that she remembers a flood in the Yellow Breeches Creek in August, 1873 (Ans. 4). She testifies that the water was very high at that time, and that the foot-bridge at Zinn's clover mill was carried away by a "large stub of a tree" (Ans. 5, 6), which she saw at Hess' Island about three or four days after the bridge was carried away (Ans. 7-10); that "there was bridge timber on the one part of the tree" at that time (Ans. 11); that about four or five weeks after that stub of a tree came down in front of her father's meadow, and lodged there (Ans. 12, 13); that she saw the tree a good many times after it took the bridge away, and remembers it with sufficient distinctness to make a sketch of it (Ans. 14-16), which is offered in evidence (Ans. 65); that the tree subsequently floated down to "Worley's Ripples," and the top being cut off of it there, the root part was afterwards carried off by high water (Ans. 17, 18). She remembers an ice flood in the Yellow Breeches, which, she testifies, was after the flood of 1873 (Ans. 19, 20). She further testifies that during the first summer that her father lived on the farm which he now occupies, he did some work on the roads, working under Andrew Shell, Henry Bitner being the supervisor at the time. (Ans. 21, 24.)

George Martin (*Id.* 65) testifies that the tree having bridge timber entangled with it, which he before testified he had seen coming down on the flood (see D. S.-reb., p. 309, Ans. 13), he first saw "a little above Hess' Island coming down" (Ans 1); that he was at the time going up along the Cumberland side in a boat (Ans. 2); that he saw the tree lodge at the island (Ans. 3, 4), where it remained for some time, he cannot tell how long, as he didn't take particular notice when it went away (Ans. 5), and afterward floated down and lodged in front of Samuel Deckman's house (Ans. 6, 7). When he saw it lodged at the upper end of Hess' Island the bridge timber was still entangled with it (Ans. 8 and 10), but that he never saw the bridge timber down at Deckman's. (Ans. 9, 10.)

Samuel M. Deckman (*Id.* 78) testifies that he first saw the tree which is said to have carried away Zinn's clover mill bridge in August, 1873, "lodged against a little island, sometimes called Hess' Island, a short distance below the foot-bridge—about five hundred yards—three or four days after the water went down so that a body could get up along the shore, I saw it first." (Ans. 6.)

He further testifies the time when he saw it was "in 1873." As near as I can get at it, between the latter part of July and the 15th of August" (Ans. 9); that a part of the bridge timber, a pier, was then hanging to it. (Ans. 11, 12.)

He testifies that "it lay there for some time—probably three or four weeks—and then it became loose after the bridge timber was taken off, from the creek having raised a little, and it then floated down to my place, lodged there against the shore on the Cumberland side till in '75—the ice flood—then it floated to my next neighbor below, Ezekiel Worley, hooked fast there on the York County side against a buttonwood tree that leaned over the creek; sometime during that summer that upright limb that caught the foot-bridge had been chopped off by some one of Worley's family there; after the creek raised again after that the tree went away; that was the last I ever saw of it." (Ans. 16.)

He further testifies that the York County bank of the creek at the foot-bridge "is very high, probably twenty-five feet," whilst the Cumberland bank is low, only from four to six feet high (Ans. 286); that the foot-bridge was composed of six logs or stretches (explanation and Ans. 77), which appear to have been arranged in three pairs (*passim e. g.* Ans. 174); that York County end rested upon the high bank (Ans. 172), whilst a tree and a post formed the abutment on the Cumberland side (Ans. 158 and 164), and the bridge was supported in the middle by two piers. (Ans. 80.)

He further testifies that he was told "that the foot-bridge was knocked down by a tree." Mr. Shell, "right after the flood—the same day," within a few hours after the accident occurred—Mr. Shell remarking at the time, "a little while before the tree came down—I chained it fast—towards morning. If I hadn't a-chained it, the whole business would a-went away" (Ans. 74); that he, Deckman, thereupon went up to the clover mill to see the damage that had been done, and found that none of the foot-bridge remained standing except the pier next to the Cumberland County bank, and the post on said bank (Ans. 166 and 272), with these exceptions, the whole bridge being thrown down (Ans. 70 and 166), and one-half of it, three logs and one pier, having been carried away, and the other three logs being chained fast to the tree on the Cumberland County bank. (Ans. 70 and 173-4.)

He further testifies that he had frequent occasion to cross the creek by the fording at the clover mill bridge (Ans. 85), and that he saw it down a couple of dozen times (Ans. 85 and 69); that it did not remain down very long, but was rebuilt in the fall of 1873, either in September or October. (Ans. 65-67.)

He further testifies that he worked on the roads in Lower Allen township in 1873 (Ans. 21); that Andrew Shell engaged him to do the work (Ans. 22); that Henry M. Bitner, who was the supervisor that year (Ans. 24, 25), was not present when he did the work (Ans. 30), but subsequently paid him for it (Ans. 26-29); that in the fall of 1873 Andrew Shell asked him (witness) to help him put up the foot-bridge at Zinn's clover mill, but that he declined doing so on account of rheumatism. (Ans. 32-34.)

Samuel C. Weber (*Id.* 148) testifies that he lived at Miller's Mill, Fairview township, York County, from the first week in February to the first day of October, 1873 (Ans. 1-3); that there was a flood along the Yellow Breeches Creek whilst he lived there, between the 10th and 15th of August (Ans. 11 and 12); that he saw two logs—apparently nailed side by side—come down the creek on that flood, and go over the dam (Ans. 13); that about a week after the flood he had occasion to go up to Zinn's clover mill to see Mr. Adam Zinn (Ans. 14); that he could not cross the creek there because the bridge was gone (Ans. 16 and 17); that the York County side was gone, and the other side hung apparently fastened to a tree (Ans. 18); and that the pier on the York County side was gone, and the other left. (Ans. 19.)

It appears from the deposition of HENRY S. RUPP (D. S.-rej., p. 227), the township clerk of Lower Allen township, and from the township book produced, that Henry M. Bitner, the Supervisor for the upper end of Lower Allen township, was allowed for township work $786.91, and for his own time, 14 days, at $1.50 per day, $21.00. It further appears that from the year 1866, down to the present time, with the exception of the year 1877 ($878.-27), the amount expended by Henry M. Bitner was larger than the amount expended by any other supervisor in the "upper end." It also appears that from the year 1866, down to the present time, the allowance to Henry M. Bitner, for his personal services as supervisor, was less than the amount allowed any other supervisor for similar services in the same district.

In explanation of this state of facts, Mr. Rupp, who, in addition to being township clerk, had been during almost all that period one of the township Auditors, and who was one of the Auditors who settled Bitner's account, testifies that "Mr. Bitner gave most of the work out by contract, and did not look after it himself as the other supervisors had done before."

It is easy to see, therefore, how foot-bridges might have been carried away in August, 1873, and repaired soon afterwards without the knowledge of Bitner, and how, even if he knew of the fact at the time, he may have forgotten it. His book furnishes no information with regard to the location or character of the work done and seldom even its date; his memory is poor and his custom of committing the township work to others instead of superintending it himself, deprived him of the means of knowledge necessary to render him competent to negative the testimony of so many witnesses. We have already seen that his testimony cannot affect the Andersontown bridge, as a county bridge was built there in 1873.

We have thus five eye-witnesses to the carrying away of the clover mill bridge in August, 1873, two of whom, Springer and Shell, fix not only the season of the year, but the year itself, and they are corroborated by Atticks.

It is true that Fetro, Haring 2nd Frederick Dickman are not able directly to fix the year, but the circumstances they relate are the same as those given by Springer and Shell, and this, together with the fact to which Fetro testified, namely, that others were present; that Haring testifies to, namely, that it was before the ice flood of 1875; that Deckman testifies to, namely, that he soon afterwards saw the bridge timber on "Hess Island," and the further fact that all three concur in fixing the occurrence in the summer time, clearly show all five witnessed the same destruction of the bridge. Moreover, the subsequent fate of the tree which did the damage is traced. Martin and Mrs. Collins saw it float down the creek with bridge timber sticking to it; Martin saw it lodge on Hess Island, whilst Samuel M. Deckman, George Martin, Minnie A. Deckman and Peter Hess saw it with the timber still sticking to it after it had lodged there, and witnesses saw it still further down the creek.

Furthermore, we have the testimony of seven persons who lived in the immediate neighborhood, and who were accustomed frequently to cross the bridge, that it was swept down at the time of the flood of August, 1873, to wit: Mrs. Collins, Mrs. Moser, Jacob W. Moser, Mrs. Boyer, Minnie A. Deckman, Samuel M. Deckman and Samuel C. Weber, and of these all but Weber testify that the bridge was thrown down by the tree.

As to the extent of the damage done to the bridge none of the witnesses in sur-rejoiner except Deckman and Weber testify definitely. According to them, whilst none of the timbers except a pier and a post remained in position, only about half of them floated away; the rest, having been chained to a tree, swung around and remained along the Cumberland shore. Those who were eye-witnesses of the accident say that the timbers, without, however, saying how many of them, floated out of sight. Possibly if questioned they might have been able to be more definite; possibly not, however. For in the excitement of the occasion, with the flood running high, they might not have noticed those which clung to the Cumberland shore, and the chaining of them, by keeping them partly under water, may have kept them partly out of sight.

As to the repairing of the bridge, Samuel M. Deckman, who was accustomed to cross the creek frequently by the fording at the bridge, and who did so a couple of dozen times, between the time it was carried away and time it was rebuilt, and was therefore well qualified to testify upon the subject, says that he did not actually see the work done, but that it was rebuilt in September or October, 1873. He says also that Andrew Shell asked him (witness), at the time it was rebuilt, to help put it up, but witness declined on account of rheumatism. His testimony shows further that Shell was, during that year, acting as a deputy supervisor under Henry M. Bitner, as witness did work on the roads at that time by direction of Andrew Shell, and was subsequently paid for that work by Bitner. In this he is corroborated by his daughter, Minnie A. Deckman.

Mrs. Collins, whose whole deposition shows her to be a woman of exceedingly clear memory, testifies positively that the bridge was put up "the same fall, the same season; that Mr. Henry Bitner was the Supervisor, and Mr. Andy Shell did the work;" and it must be remembered that the bridge was plainly in sight of the spring where where she got the water for her household use.

Andrew Shell was a carpenter (Jacob K. Shell. D. S. rej., p. 26 and 32; George S. Sipe, D. S.-rej., p. 269 and 32, Ans. 32), and had been employed to repair this same bridge on two other occasions—once in August, 1871, when David Smith worked for him (D. Smith, C. Vol. 3, p. 1895, Ans. 7), and once when the bridge had been blown down in the dead of winter, and at the time of repairing the hands were unwilling to get into the water, but were compelled to do so in order to rescue Andrew Shell from a perilous position. This, however, was a good while before the accident to the bridge at the time of the flood of 1873. (Jacob K. Shell, D. S.-rej., pp. 25, 26, Ans. 26, 27, and 32–34.) He was not supervisor at this time (*Id.* Ans. 33); nor was he in 1871, as Samuel M. Bitner held that office for the upper district of Lower Allen township in that year (see H. S. Rupp D. S.-rej., p. 229); yet he had charge of repairing the bridge, and, so far as the testimony shows, no regularly elected supervisor was present (Ans. 9). The care with which he secured the

Cumberland end of the bridge by chaining it fast "*towards morning*," is at least an indication that he felt some responsibility with regard to the township property. The result of his precaution was that all of the Cumberland side of the bridge was saved, and thus the expense for its repair falling upon his township could have been scarcely more than the cost of the necessary labor. Unfortunately, Andrew Shell is dead, and cannot give any information upon the subject. As is also his son, Abraham Shell, who is shown by Bitner's book to have worked for the township (H. M. Bitner, C. Vol. 3, p. 2360, Ans. 72), and may have been employed on this very work.

Were the question one of any great materiality, and did time and space permit, a number of other reasons might be offered in support of the testimony of Deckman and Mrs. Collins; but enough has already been said to show that that testimony is more reliable than the negative testimony of such a witness as we have seen Henry M. Bitner to have been.

Adam Baker, the York County supervisor, was not called by either side on account of his age and infirmities. (See statement of complainants' counsel, C. Vol. 3, p. 2081.) However, his son, Isaac Baker, was one of complainants' agents employed in collecting testimony, and it is fair to presume, from the desperation with which they have fought ths case throughout, that if they could have derived any information of value through Adam Baker, they would have contrived some method of using it.

But, *to conclude*. The result of the flood discussion is, that instead of the witness E. B. Hoffman being contradicted and his date shaken, he is overwhelmingly corroborated in every important particular, and the fact that he did see talking-machines at Drawbaugh's shop at the time and under the circumstances he testifies to, established by additional testimony.

APPENDIX C.

COMPLAINANTS' NEGATIVE WITNESSES.

Mr. J. Bailey (C. Vol. 2, 1095) testifies that on the 3d of March, 1878, he accompanied George W. Heiges and George W. Mumper to Drawbaugh's shop; that Daniel Drawbaugh then and there showed them his electric clock and explained it at length, but that he did not mention the subject of electric speaking telephones or talking machines. See George W. Heiges, *infra.*

Cyrus Bowman (C. Vol. 1, 666) testifies that he lived at Eberly's Mills from April 1, 1874, to March 1, 1876, during which time he ran the grist-mill owned by George Leonard; that during that time he was down at Drawbaugh's shop at various times, "sometimes on business and sometimes not." He remembers of seeing several of Drawbaugh's inventions, but denies that he ever saw or heard of Drawbaugh's talking machine while living at Eberly's Mills. "I didn't see anything of the kind, nor I didn't hear Mr. Drawbaugh say anything of the kind, or anybody else" (p. 674, Ans. 46).

On cross-examination, however, he is able to recall, of all the machines that he saw at Drawbaugh's shop, only "a clock, a nail cutter, and a bell, a machine that he had," and fails to remember a large number of Drawbaugh's machines which are testified to as being there at that time by numerous others of complainants' witnesses (*e. g.* D. A. Hauck, C. Vol. 1, p. 820; E. M. Nichols, C. Vol. 1, p. 861). He admits further that he saw there "some of his (Drawbaugh's) nicknacks that he was working at."

Cross-Q. 152. Did you know what the nick-nacks were?

Answer. No, sir. He always had different machines there that he was working.

Cross-Q. 153. And you didn't know what they were, did you?

"A. It would have been very hard for a man to understand what they were."

He is contradicted:

First—By Frank D. Hackett (D. S.-reb., 690), who testifies that he moved to Milltown with Cyrus Bowman, and worked for him there from the spring to the fall of 1874; that he heard Drawbaugh's talking machine talked of at Milltown in the mill and in the store, "in the spring of 1874, while I working for Cyrus Bowman."

He further testifies that he heard a good deal of talk about it backward and forward by the people in the neighborhood, among others, by the storekeeper, Abner Wilson (store blown up January 19, 1878, C, Exhibits 401, killed, prior to November 5, 1875, *Id.* 402) and by Cyrus Bowman himself.

Second—By his sister-in-law, Mrs. Margaret Sweigert (*Id.* 869), who testifies that she visited in Mr. Bowman's family while he resided at Eberly's Mills, and then and there heard Daniel Drawbaugh's talking machine spoken of. "I heard my sister and brother-in-law Mr. Cyrus Bowman, and his wife and their children speak of it. They said it was a talking-machine—called it a talking machine."

She further testifies that the children of Cyrus Bowman to whom she refers were his two oldest daughters, who both died in December, 1874. (See Mrs. Martha M. Bowman, C. Vol. 3, 2011, Cross-Ans. 30.)

Third—By his brother-in-law, J. Porter Harris (D. S. reb., 465), who testifies that he visited Cyrus Bowman whilst the latter resided at Eberly's Mills from April 1, 1874, to March 1, 1876; that he then heard Daniel Drawbaugh's talking machine talked about in Bowman's family by his children—he thinks by his oldest daughter, who is dead.

Complainants attempted to reply to this testimony by calling Mrs. Martha M. Bowman (C. Vol. 3, 2008), who testifies that she never heard of Drawbaugh's talking machine whilst she lived at Eberly's Mills.

And by recalling Cyrus Bowman himself (C. Vol. 3, 2013), who testifies that whilst he lived at Eberly's Mills there never was any talk in his family, by his wife, or either of his children then living, or himself, about Daniel Drawbaugh having a talking machine.

He further testifies that he never talked to or heard his wife or children talk to either J. Porter Harris or Mrs. Margaret Sweigert about Daniel Drawbaugh having a talking machine.

It is perhaps, however, significant that he does not deny having conversation with Frank D. Hackett on the subject.

Jacob Carns, C. Vol. 1, p. 883, testifies that he began to work in the machine shop at Eberly's Mills, August 10, 1868, for the Drawbaugh Manufacturing Company, and continued to work for said company until February 4, 1871, and produces a book account fixing those dates.

He further testifies, and produces book entries in corroboration, that he boarded in Daniel Drawbaugh's family from February 27, 1869, until August 7, 1869; and that between the spring of 1871 and December, 1875, he called several times at Drawbaugh's shop and house. Besides boarding in Drawbaugh's family his personal relations with the members of it seem to have been intimate, much of his leisure time being spent with them.

He further testifies that several others of the shop hands boarded at Drawbaugh's at the same time he did, and that during that period Drawbaugh had living in his family a domestic, named Maggie Darr.

In his deposition he gave a list, comprising a large number of machines and contrivances which he understood that Drawbaugh had got up or devised. (C.Vol. 1, 891, *et seq.*, Ans. 43, *et seq.*) But when shown respondent's exhibits A to Q, inclusive, he denied having seen anything like them at Milltown, either at Mr. Drawbaugh's shop or his house. (*Id.* 894, 895, Ans. 71–73.)

He further testifies as follows:

"Q. 74. Please state whether you ever heard from Mr. Drawbaugh, or any one else, while you worked at Milltown, or during any of your subsequent visits there, that he had a talking machine by which a person could transmit speech from one place to another by speaking at one end and listening at the other?

"A. I don't remember of ever having heard anything.

* * * * * *

"Q. This present controversy began in the summer of 1880, that is, about two years and a half ago. I wish to know whether or not you had ever heard from any one before that time, that Daniel Drawbaugh had invented, or claimed to have invented, a talking machine by which what a person said at one place would be transmitted to and heard at another by means of electricity?

"A. I have not."

And further, that he did not think that Mr Drawbaugh could have had talking machines, and been in the habit of showing them generally to people, between August, 1868, and February, 1871, without his knowing it; nor could Drawbaugh have had talking machines during said period without his knowing it.

And further, that judging from their personal relations, and his position in the shop as a young man of eighteen or twenty, if Drawbaugh had had occasion to experiment much by having some one to talk or sing into a talking machine, he thought he would naturally have asked him to assist in that way.

In contradiction of Jacob Carns, defendants called several witnesses, the first of whom was Mrs. Margaret Brenneman (D. S.-reb., p. 103, *et seq.*), who testifies that her maiden name was Maggie Darr; that she had lived at Milltown, or Eberly's Mills, up to some time in 1870, when she moved away; that she was never back to Milltown again except once, when she passed through without stopping, some time prior to December, 1872; that she lived in Daniel Drawbaugh's family about eight or nine weeks, whilst Jacob Carns, John Schrader and several others were boarding in it.

She testifies that at the time she saw Drawbaugh's talking machine, and that it was a good deal talked of in Drawbaugh's family and among his boarders; that she heard his wife and his boarders all talk about it, mentioning particularly Carns and Schrader; that she is positively sure she heard Jacob Carns talk about it at the time she lived in Mr. Drawbaugh's family, and he boarded there.

She is corroborated by Mrs. Mary M. Darr, her mother (*Id.* p. 109), who testifies that she heard her daughter Maggie speak of Mr. Drawbaugh's talking machine while she (Maggie) lived in Mr. Drawbaugh's family, and that prior to December, 1870, Mr. Drawbaugh's talking machine was generally known and talked about among the people at Milltown.

2. William H. Zearing (*Id.* 122 *et seq.*), who testifies that he first saw Drawbaugh's talking machine several years prior to November 35, 1873: "It was at the time that Jacob Carns was working at the shop" (*Id.* 125, Ans. 126); that Jacob Carns was present at the time in the shop, and further as follows (*Id.* 125, Q. 29): "Did you ever have any conversation with Mr. Jacob Carns about Daniel Drawbaugh's talking machine; if so, when and where?

"A. Shortly after I had seen it the first time, I met him about Shiremanstown, and spoke to him as regards to this talking machine. I considered it rather of a humbug, and asked him his opinion of it. He expressed himself as I did about it, and did not seem to think it would prove a success."

3. Samuel H. Bates (*Id.* 380), who testifies (*Id.* 382, Ans. 19 *et seq.*) that Jacob Carns told him at Shiremanstown, in 1878, when he (Carns) was home settling up the estate of his mother, that he (Carns) had seen Drawbaugh's talking machine "when he was working for Drawbaugh at the faucet business." [Carns testified (C.Vol. 1, 890) that his mother died in April, 1878, and that he was back to Shiremanstown in May, 1878.]

4. John C. Schrader (D. S.-reb., 467), who testifies that he worked for the Drawbaugh Manufacturing Company from some time in November, 1868, to some time in April, 1869; that during part of that time from some time in March, 1869, until he left Milltown in April, 1869, he boarded at Daniel Drawbaugh's, in company with Charles Umberger and Jacob Carns; that Carns was still boarding at Drawbaugh's when he left; that Maggie Darr lived in the family at the time; that during that period (November, 1868, to April, 1869) Daniel Drawbaugh showed him his talking machine in his private room at the machine shop.

He identifies "Exhibit B," and testifies with regard to its missing parts. He further testifies that he recollects of Mr. Drawbaugh speaking of it *at the table* on several occasions.

Wm. Darr (C.Vol. 1, 158) testifies that he lived at Eberly's Mills, or Milltown, for twenty years prior to the last day of March, 1870; that whilst living there he frequently went to Daniel Drawbaugh's shop; that he never saw any talking machine there, and never heard of any there.

On cross-examination, however, he admits that he did have a conversation on the subject whilst living at Eberly's Mills, with Daniel Drawbaugh, in which Drawbaugh spoke of talking across the sea; whereupon he (Darr) replied: "Oh, you had better try the Yellow Breeches first," and further said: "What is the matter with you, Dan; are you going crazy?" He shades off Drawbaugh's remark, however, to a mere suggestion, that the time was "coming when we can talk across the sea," and denies that Drawhaugh said he was going to do it, or had a machine that could do it, or anything of the kind.

He is contradicted:

First—By his wife, Mrs. Mary M. Darr (D. S.-reb. 100), who testifies (110, Ans. 12, 13): "He (Wm Darr) came in one day and said to me that Mr. Drawbaugh was speaking of making a telephone, or some sort of a talking-machine, that he could talk across the ocean with to other parts of the world; I don't remember just how he spoke it."

"Q. 13. Did he tell you what he said to Mr. Drawbaugh? if so, what was that, as you remember it?

"A. He told him he had better invent something to talk across the Yellow Breeches first."

She further testifies that this conversation was in 1866, and that prior to their removal from Milltown, Drawbaugh's talking machine was generally known and talked about among people there.

She further testifies that before they moved away from Milltown, her husband, Wm. Darr, was a man of intemperate habits, and that the use of intoxicating liquors affected his nerves a great deal; his nervous system has gradually grown worse for some years, and has affected his memory. Further that she was compelled to separate from him on account of his intemperate habits, abusive treatment, and his failure to provide for her.

Second—By his daughter, Mrs. Margaret Brenneman (*Id.* 103), who testifies that Drawbaugh's talking machine was a matter that was known and talked about in her father's family; that her father, whilst living at Milltown, drank a great deal, so much as seriously to impair his bodily health and mental condition, and that to the best of her knowledge since that time he has been a man of unsound condition; he has been afflicted with a nervous disease, which has affected his memory very much.

Third—By his son-in-law, John M. Brenneman (114) who testifies that shortly after his marriage (December 24, 1872), in 1873, he heard the talking machine spoken of at different times in Wm. Darr's family.

Fourth—By his daughter, Mrs, Jennie M. Brown (*Id.* 163), who testifies that prior to her marriage [July 7, 1868], she often heard Drawbaugh's talking-machine spoken of by her "father" (Wm. Darr), "and mother and folks that came in at home," and that it was all the tolk at Milltown for a while, she having heard many people speak about it; and further that her father has been nervous and weak-minded for two or three years; and that his memory has not been reliable for that length of time.

Fifth—By Jacob M. Peterman (*Id.* 471), who testifies that he first heard of Drawbaugh's talking machine from Wm. Darr, whilst the latter lived at Eberly's Mills, and that Darr went with him down to Drawbaugh's shop for the purpose of seeing it, but Mr. Drawbaugh was not in, and they failed to see it.

Abraham Ditlow (C. Vol. i.,967) testifies that he moved to Wheeler, Indiana, in the spring of 1876; that he returned East in the fall of the same year, going West again in the spring of 1877, and never returning to the East again until brought to Philadelphia to testify.

He is assisted by counsel for complainants in fixing the date when he last went out West as about March 19, 1877, by means of a railroad shipping receipt, commented upon in the discussion of the testimony of Joseph Ditlow.

It appears from his testimony, and that of his brother, Joseph Ditlow (*Id.* 958, *et seq.*), that the witness, prior to the spring of 1876, lived in the neighborhood of Eberly's Mills. He testifies that he had known Daniel Drawbaugh before that time, and had been in the habit of going to his shop a good deal; that he was intimate with Daniel

Drawbaugh's nephew, George Drawbaugh, and was in the habit of seeing, at the shop of the former, the things which he, Daniel Drawbaugh, had gotten up, or invented, of which he names a number.

He further testifies that whilst in the East, during the winter of 1876-77, he spent part of his time at Milltown; that whilst there in the spring of 1877, he heard George Drawbaugh speak of Daniel Drawbaugh's talking machine; that George Drawbaugh spoke of it as if it were a new thing, and said his uncle was going to make a fortune out of it if he could get it working all right; that it impressed him (witness) as a new thing, that he had never heard of it before, and "couldn't believe it very handy."

He further testifies that he has never seen at Drawbaugh's shop a talking machine, or anything of the kind, and, upon examining exhibits "A" to "J," inclusive, denies ever having seen any of them.

Upon cross-examination he repeats his testimony, given on direct examination, and denies with the utmost emphasis, not only all knowledge of Drawbaugh's talking machine prior to the spring of 1877, but also the possibility that Drawbaugh could have had a talking machine at his shop before that time without his knowing it.

He is contradicted:

First—By his sister, Mrs. Mary A. Evans (S.-reb., 61), who testifies (67) that prior to the death of her father, Abraham Ditlow (which happened February 21, 1873), Drawbaugh's talking machine was spoken of in his family in a conversation in which her father took part; and that her brother, Abraham Ditlow, was present at the time.

Second—By Alexander Milner (*Id.* 512), who testified that he became acquainted with Abraham Ditlow in Wheeler, Porter County, Indiana, soon after the latter went out there in the spring of 1876; that some time in the spring of 1876, whilst Abraham Ditlow was working under him, the latter, in a conversation about the progress of invention, told him about Daniel Drawbaugh's talking machine, and, further, told him that he had seen and talked through it at the time when he (Ditlow) went to Drawbaugh's shop to see about getting a stove made to go trapping with.

He further testifies that Abraham Ditlow told him at that time that Drawbaugh had not taken out a patent on his talking machine, because he was too poor to do so.

Third—By C. B. Clifford, who testifies (*Id.* 515) that he became acquainted with Abraham Ditlow in 1876, near Wheeler, Porter County, Indiana; that in May or June of that year, Ditlow told him that a man in the East, by the name of Daniel Drawbaugh, had invented a talking machine with which he could talk through the shop. He remembers that Ditlow said there was a glass tumbler attached to one end of it; and he understood, from what Ditlow said, that the latter had seen it some time before that, but how long he (Ditlow) did not say.

He further testifies that Ditlow told him that Drawbaugh had said he was too poor to have it patented.

And, *finally*, Abraham Ditlow himself was recalled by defendants (D. S.-reb., p. 876), when he testified that since giving his depositions for complainants, he had reflected further, and remembered to have seen and heard Daniel Drawbaugh talk through the talking machines as early as the fall of 1874 (Ans. 11–45 and Cross-Ans. 63, *seq.*), and that he was satisfied that he had seen it before that time (Ans. 46). He relates in detail the circumstances under which he saw and heard Drawbaugh talk through the talking machine in the fall of 1874.

Joseph Ditlow, of Wheeler, Porter County, Indiana (C. Vol. i., 958), testifies that he formerly lived at or near Eberly's Mills before he went West; that he went West the last time in 1877, which date he fixes by a railroad receipt for the shipment of "two boxes H. H. goods from Marysville, March 19, 1877, from Joseph Ditlow, marked Joseph Ditlow, Wheeler, Porter County, Indiana;" that he has lived near Wheeler ever since, and has not been East since that time; that he had been in the habit of going West for the farming season before that time from 1869 or 1870; that during that time he spent his winters East, principally trapping in winter time, and considered his home East, and in the neighborhood of Milltown; that when so East in the winter, he was in the habit of frequenting the store at Eberly's Mills, and of going to Daniel Drawbaugh's shop from time to time.

He mentions a number of Drawbaugh's inventions which he had seen there, but testifies that he first heard that Daniel Drawbaugh had a talking machine, or anything that was claimed to be a talking machine, in the store at Milltown from George Drawbaugh, who came in laughing, and said: "I had lots of fun with Dan, talking on a wire," and that George listened at one end whilst Dan talked at the other, and then changed positions; that this occurred in the winter of 1876–77, and witness thinks it was in the latter part of the winter; that when he heard George Drawbaugh's remarks, the talking machine struck him as something new, which he had never heard of before in his life.

He further testifies that he never saw any machine at Milltown at any time which he understood was a talking machine, or which he was told was a talking machine, and beyond the magnet on "C reproduced" he fails to identify any of the exhibits which are shown him. On cross-examination he testifies that he thinks he did his first work on the farm of Harmon Hardesty in Indiana in 1873; that he spent the winter of 1873–74 East, and thinks he was trapping in the East in the winter of 1874–75; that he spent the winter of 1875–76 in Indiana, and 1876–77 in Pennsylvania; that he thought Drawbaugh's talking machine a very wonderful invention, the most interesting and wonderful of all Daniel Drawbaugh's inventions, and that although he never went to the shop to see it, yet he told Mr. and Mrs. Hardesty about it after he went West in the spring of 1877, and whilst he was living with them.

He is contradicted by Sidney S. Reed (D. S.-reb., 476), who testifies that Joseph Ditlow boarded with him at Wheeler, Indiana, from the 17th of May until some time in June, 1870, which date he fixes by book entries, and that at that time Ditlow told him about Drawbaugh's talking machine.

Reed is the station agent at Wheeler, on the Pittsburg, Fort Wayne and Chicago railroad, and produces the freight receipt book kept by him at that station, upon which appear two entries of freight received for Joseph Ditlow, the first being dated September 25, 1874, and the second March 30, 1877.

It appears further that in both cases the boxes were billed to Wheeler from Pittsburg, and that in addition to the freight from Pittsburg to Wheeler there were charges showing that they had come from a point beyond Pittsburg.

He recollects that the goods received September 25, 1874, were contained in a box, and that Ditlow told him at the time that the box contained steel traps, with which he and a man who worked for Porter Congdon were going off up the Kankakee river to trap that winter.

S. G. Geib (D. S.-reb. 1134), station agent at Marysville, Perry County, Pa., produces the record of freight forwarded by the Pennsylvania railroad from that station, upon which appear two entries of goods consigned to Joseph Ditlow, billed to Pittsburgh transfer, aud marked for Wheeler, Porter County, Indiana. The date of the first being September 19, 1874, and of the second March 30, 1877.

Mrs. Isabella Hardesty (D. S.-reb. 483) testifies that Joseph Ditlow commenced to work for her husband, Harmon Hardesty, at Wheeler, Porter County, Ind., in the spring of 1874; that he and Cyrus Kissinger, who then lived with Porter Congdon, went trapping in the fall of that year; that previous to starting on said expedition, Ditlow had been for some time expecting his trapping kit from Pennsylvania, and was particularly anxious about a stove which belonged to it, and which he told her he wanted, because Mr. Drawbaugh made it for him; and that he at the same time told her that Mr. Drawbaugh was an ingenious man who had been making a talking machine, as he called it, and that he (Drawbaugh) had a talking machine to talk through the house.

She remembers that the kit arrived afterwards, and that it was sent to him a second time in 1877, but that the conversation about the talking machine occurred whilst he was expecting it the first time—in 1874.

3. Saloma Hardesty (*Id.* 489), the daughter of Harmon Hardesty, testifies that she remembers of Joseph Ditlow going trapping with Cyrus Kissinger in the fall of 1874; that they used a trapping kit belonging to Joseph Ditlow, which he had received from the East a short time before; that the kit was packed in a chest when it came, and was brought to her father's house, and there opened;

that at the time it was opened Ditlow told those who were present, among whom she was, about Mr. Drawbaugh "making his stove for him, and about him inventing a talking machine," which he told them was in Drawbaugh's shop, and was so arranged that he could talk upstairs with it.

She further testifies that Ditlow mentioned Drawbaugh's talking machine on more than one occasion.

4. Harmon Hardesty (*Id.* 493) testifies that Joseph Ditlow began to work for him in the latter part of May, 1874, and worked five summer seasons successively; that in the fall of 1874 Ditlow received, by the Pennsylvania railroad, a pine box or chest, containing traps and trapping utensils; that he (Hardesty) brought the box from the railroad station at Wheeler to his house; that whilst they were opening the box and unpacking it, Ditlow told him about Mr. Drawbaugh. "He said he was a very ingenious man; he told about fixing up the stove for him; he said he had made a talking machine, by which he could talk through his buildings;" that Ditlow further told him that he himself had seen it, and that he described it as an old tumbler at one end and an oyster can at the other end, which were connected with wire.

He further testifies that he (witness) took Cyrus Kissinger and Joseph Ditlow, having with them Ditlow's trapping kit, to Crooked Creek, which empties into the Kankakee River, for the purpose of trapping; that when that expedition was over, the trapping kit was brought back to his house, and that he (witness) shipped it back to Pennsylvania in the latter part of September, 1875; that it came out to Indiana again in the spring of 1877; and that Ditlow spoke about Drawbaugh's talking machine again, about a week or ten days after his box was opened.

He further testifies that he was taken to Philadelphia, in April, 1883, before complainants had closed their testimony, as a witness for the Bell Telephone Company in this suit by a man named Tompkins, an agent of complainants; that he was taken to the Hotel Lafayette, Philadelphia, and was asked to sign a statement which was written by complainants' counsel, and that he signed it; that he and Tompkins had quite a talk about the arrival of the kit, and as to the dates, as Tompkins informed him that it arrived in 1877, and that he, witness, was not "in shape to know any different at that time without reference to earlier dates at home;" that he was thus induced to say, in said written statement, that Joseph Ditlow spoke to him about Drawbaugh's talking machine for the first time in the spring of 1877; that immediately after the statement was signed—the same evening—he told Tompkins that he didn't think he was right, whereupon Tompkins showed him a memorandum, which set forth the date of the arrival of the kit at Wheeler as in 1877, and which he (Tompkins) claimed to have made from a railroad receipt; that he (witness) still expressed his doubt with regard to the date, and upon his return home to Indiana he looked up the matter, and discovered that the kit had arrived at Wheeler September 25, 1874, and was then satisfied that that was the time when Joseph Ditlow first told him about Drawbaugh's talking machine.

5. Hamlin Hardesty (*Id.*, 509), a son of Harmon Hardesty, testifies that he was present when Joseph Ditlow's trapping kit arrived and was unpacked at his father's house in the fall of 1874; at the time Ditlow stated that Mr. Drawbaugh was the man who made the stove for him, that he was an ingenious man and had invented a talking machine; that Ditlow said "he had seen it in the shop, and it talked up-stairs to a man." He testifies that the kit arrived at Wheeler twice, the second time in 1877, but that the conversation about the talking machine took place at the time of its first arrival.

6. Joseph Ditlow, himself, is recalled (*Id.*, 521) and testifies that after having had nearly a year's time for reflection on the subject, and for refreshing his memory, he still believes that he first heard of Daniel Drawbaugh's talking machine in the Milltown store from George Drawbaugh; that he can't fix the date when he first heard of it, but is satisfied that the date given in his former deposition—between the fall of 1876 and spring of 1877—when Jeremiah Fry kept the store—was not correct, and that he heard of it and saw it before that time.

He testifies that he has no recollection of having told Reed about Drawbaugh's talking machine in the summer of 1870, but that he boarded with Mr Reed at that time, and, from his knowledge of Mr. Reed as a man, he is satisfied that his (Reed's) statement is correct; that he is also satisfied that the testimony of the Hardestys to the fact that he told them about Drawbaugh's talking machine in the fall of 1874, at Wheeler, Indiana, is correct.

He further testifies that the first persons who came to see him in Indiana on behalf of the Bell Telephone Company were Mr. Comfort and Mr. Storrow; that they exhibited to himself and his brother Abraham some talking machines, and that his brother Abraham pointed out a machine or machines which he had seen before, or which was familiar to him, whereupon "Mr. Comfort said that he (Abraham) never saw that at that time at Drawbaugh's shop;" that whilst at Philadelphia, Comfort prepared a written memorandum of dates, which he gave to witness, and told him to read it over, and study it so that he would have it by heart.

Jacob Evans (C. Vol. 1, 974) testifies that he was married to Mary A. Ditlow in September, 1874; that in November, 1874, he began to work at milling at Etter and Shanklin's Mill [about one-fourth of a mile below Milltown on the Yellow Breeches Creek], and worked there until some time in September, 1875, when he quit and moved to Milltown, working back and forward for Cyrus Bowman at George Leonard's grist mill until the 1st of March, 1876, when he took charge of said mill as head miller for Dellinger and May, who at that time purchased it from George Leonard. He continued to live at Milltown until the spring of 1881, when he moved to Fishing Creek Valley, York County; that when he first moved to Milltown, in September, 1875, he moved into a house owned by George Leonard, opposite the house then occupied by Daniel Drawbaugh and now occupied by Daniel Fettrow, remaining in it until the following spring (1876), when he moved into a house owned by Dellinger and May, and remained in it until July, 1876; that he then moved into another house owned by George Leonard, and there remained until the spring of 1878, when he moved into the house in front of the mill which had just been vacated by Daniel Drawbaugh, and there remained until the spring of 1879, and thence moved into another house owned by George Leonard, remaining there until some time in 1880, when he returned to the house in front of the mill, and remained there until he left Militown.

Counsel for complainants took especial pains to bring out from the witness the fact that the George Leonard house, in which he lived from September, 1875, until the spring of 1876, was not the same Leonard house in which he subsequently lived.

Witness testifies that, whilst residing at Milltown, he went down to Drawbaugh's shop, and that Drawbaugh showed him there some of his inventions, among other things his electric clock, telegraph instrument, magnets and machine for wrapping wire, and hydraulic rams; that Drawbaugh told him about his machine for making paper bags; that he could not remember that he had ever seen any talking machines at Drawbaugh's shop; that he did not think that if he had seen any he could have forgotten the fact.

Upon being shown Exhibits "A" to "Q," inclusive, exhibit "I," he testifies that he cannot remember of seeing anything like them in the shop, and, further, that he does not remember ever having heard Drawbaugh say anything about talking machines; that his first knowledge of Drawbaugh's talking machine was some time in 1877, when he heard different persons talk about it; that the first time he ever saw anything connected with Drawbaugh's talking machine was just before Christmas, 1877, when he saw a wire run from the shop across to the hill opposite.

Upon cross-examination he reiterates his denial of any knowledge of Drawbaugh's talking machine prior to 1877.

In contradiction of his testimony defendants called a large number of witnesses, to wit:

First. His brother, Andrew Evans (D. S.-reb., p. 1), who testifies that he began to work for Ambrose Knaub, in Dillsburg, York County, Pa., on the 8th of November, 1875, and worked for him one month; that during that time he (Evans) owned a horse and buggy, which he kept at Ambrose Knaub's, and which Knaub borrowed to attend the funeral of his landlord, Jacob Hurst, at Mechanicsburg, Pa.; that on a Saturday, toward the latter part of the time he lived with Knaub, either in the last of November or the beginning of December, 1875, he drove the said horse and buggy down to Eberly's

Mills, taking his two sisters, Sarah E. Evans and Margaret Jane Evans (now Mrs. Margaret J. Erb), to visit their brother, Jacob Evans; that they remained at their brother's until afternoon of the next day (Sunday), when they returned home; that whilst there he visited Daniel Drawbaugh's shop on Sunday in company with his two sisters and his brother Jacob and the wife of the latter; that Daniel Drawbaugh then and there exhibited to them his talking machines, his brother, Jacob Evans, being present.

Witness identifies "B," "C," "D" and "E," and testifies that Drawbaugh went into another room and talked through his machines, whilst Jacob Evans listened; that Drawbaugh explained his talking machine to them, telling them "it was worked by electricity," and that he could "take this machine and talk clean out to Europe across the ocean;" that he "seemed enthusiastic about his talking machine invention;" and that upon their return to Dillsburg he spoke to others about the talking machine he had seen at Drawbaugh's shop.

He further testifies that at the time of that visit his brother Jacob lived in a house (which is now torn down) in the upper end of the town, not far from the blacksmith shop, and on the opposite side of the road from it; that he never again visited his brother Jacob in compony with his two sisters, and never was again in Drawbaugh's shop, so far as he can remember, except in 1879, when his wife was with him, and he did not see the talking-machines, and had no conversation with Drawbaugh.

He mentions, among other things which he saw at Drawbaugh's shop when he and his sisters and brother Jacob were there, patent axles.

Second.—Mrs. Margaret Jane Erb (*Id.* 47) testifies that in the fall of 1875, her brother, Andrew Evans, whilst he was living at Ambrose Knaub's, took her sister Sarah and herself on a Saturday to Eberly's mills, to visit their brother Jacob; that they remained there until the next afternoon (Sunday), when they returned home; that on Sunday morning her brother Jacob and his wife, and her brother Andrew, her sister Sarah and herself visited Daniel Drawbaugh's shop; that Drawbaugh then and there showed them talking machines, by which, he said, he could talk across the ocean.

She picks out " D " and " E," and testifies that she does not remember rightly which one of the two she saw, but thinks it was " E "; that on her return home she told her folks about seeing Mr. Drawbaugh's talking machine, and about his saying he could talk across the ocean.

She further testifies that her brother Jacob at the time of the visit was living in a white-plastered house, which is not now standing, but which was then up alongside of the hill; that she never visited her brother Jacob in company with her brother Andrew at any other time, nor was she ever at any other time at Drawbaugh's shop.

Third.—Sarah Elizabeth Evans (*Id.* 55) testifies that her brother Andrew took her and her sister Jane (now Mrs. Erb), with his horse and buggy to Milltown, to visit their brother Jacob, in the latter part of November, 1875; that Andrew was at the time living at Ambrose Knaub's; that they left home on Saturday and returned on Sunday; that whilst at Milltown they visited Drawbaugh's shop in company with their brother Jacob and his wife, and then and there saw Drawbaugh's telephone.

She identifies " A " and " D," which she says she is sure she saw, and thinks she saw " B," " C," " E," " F " and " I," but is not positive; she says she saw a number of instruments there, but couldn't remember them all.

She remembers that Drawbaugh talked through the machines, and that her brother Jacob listened; and further, that Drawbaugh said " he could talk across the ocean if he could get his wires fixed across the ocean." She further testifies that she never was at Drawbaugh's shop at any other time, and that on her return home she told the folks there what she had seen in Drawbaugh's shop.

Upon being recalled for further cross-examination by complainants with regard to the state of the weather at the time of the visit to her brother Jacob, she testifies that it was pretty cold on Sunday evening, but was neither snowing nor raining; " it was cloudy, but it didn't give no falling weather."

Fourth.—Ambrose Knaub (*Id.* 38) testifies that Andrew Evans was in his employ about a month, beginning early in November, 1875; that he [Evans] had at that time a horse and buggy, which he kept at his [Knaub's] place;

that during that month Knaub borrowed said buggy to attend the funeral of his landlord, Jacob B. Hurst, who died at Mechanicsburg. (November, 18, 1875, buried November 20, 1875. Hurst, *Id.* p. 75.)

He further testifies that, whilst living with him, Andrew Evans took said horse and buggy and drove, accompanied by two of his sisters, down to somewhere near New Cumberland, to visit his brother Jacob; that Andrew Evans was gone from Saturday dinner until Sunday evening; that upon his return, he [Evans] told him [Knaub], that he and his brother had been to the shop of Mr. Drawbaugh, and had seen a talking machine which Mr. Drawbaugh had invented, and had heard him talk through it.

He is corroborated by his wife, Eliza Knaub (*Id.* 42), who remembers of using Andrew Evans' buggy, whilst he lived with them, to attend the funeral of their landlord, Mr. Hurst; that Andrew Evans lived with them one month, and that, whilst living with them, he made a visit to his brother, Jacob, using said horse and buggy, and taking his sisters with him; that upon his return he (Andrew Evans) talked about something he had seen that was something of a curiosity, but she (witness) did not understand about it, and does not remember what it was.

Fifth.—David Evans (*Id.* 86) testifies that he remembers of the visit of his brother Andrew, and his two sisters, Sarah Elizabeth and Margaret Jane, to his brother Jacob, at Milltown, in the fall of 1875; that they went on Saturday and returned on Sunday; that he had a talk with his two sisters on Sunday evening when they came home; that they told him they had visited Drawbaugh's shop at Milltown, and had seen a talking machine; that Mr. Drawbaugh had told them that "if he had wires to it he could talk across the ocean into Europe."

Sixth.—Mrs. Elizabeth Evans (*Id.* 75) testifies that she is the aunt by marriage of Jacob, Andrew, Sarah and Jane Evans; that she has lived for seventeen years with her father, Moses Evans; that she remembers the fact of the last-named three making a visit with their brother Jacob at Milltown while Andrew was living with Ambrose Knaub; that they started from home on Saturday afternoon, and returned Sunday evening; that on Sunday evening or Monday after their return, the Evans girls told her that they had been at Drawbaugh's shop with their brother Jacob and his wife; that they had seen great curiosities there, among other things a talking machine that Drawbaugh said "he could talk across the ocean with, away into Europe," and that he did talk through it whilst they were there; that their brother Jacob Evans was present when they saw the talking machine.

Seventh.—Moses Evans (*Id.* 78) the father of Jacob and Andrew Evans, testifies that his son Andrew went to work for Ambrose Knaub about the beginning of November, 1875, and worked for him about a month within a day or two; that whilst employed there Andrew with his two sisters, Jane and Sarah, made a visit to their brother Jacob at Milltown, some time in the latter part of November or beginning of December, 1875; that they left home on Saturday and returned on Sunday evening; that upon that evening after their return, the girls told him that whilst at Milltown they had seen Drawbaugh's talking machine, and that Drawbaugh had told them he could talk across the ocean.

Eighth.—Mrs. Elmira Rentzel (*Id.* 83), a sister of Jacob Evans, testifies that in the fall of 1875 she was living at Joseph Best's; that she knew of her brother Andrew living with Ambrose Knaub in the fall of that year; that she was at her father's house about a week after Andrew, Sarah and Jane had made their visit to Milltown, which her sisters told her of; that they told her their brother Jacob had taken them to Mr. Drawbaugh's shop, and that "they had seen a talking machine there; that Mr. Drawbaugh could talk across the ocean;" that she herself visited her brother Jacob at Milltown in February of 1876, when the visit of Andrew, Sarah and Jane was spoken of in his family, and that Jacob then told her about Mr. Drawbaugh's talking machine, and said he would take her to see it, but something happened to prevent his doing so.

Ninth.—Mrs. Mary A. Evans (*Id.* 61), the wife of Jacob Evans, testifies that she heard about Drawbaugh's talking machine before the death of her father, which happened February 21, 1873, and long before her marriage (September 12, 1874); that she moved with her husband to Milltown in the fall of 1875, into a rough-plastered house—which has been torn down now—on the right-hand side as you go up the hill, nearly opposite the blacksmith shop; that they lived there from the fall of 1875 to the 2d of April, 1876, when they moved away, and never lived in that house afterward; that she remembers the visit of Andrew Evans and his two sisters, which happened some time between October and December, 1875, whilst she lived in the aforesaid house; that they came on Saturday and stayed until Sunday afternoon; that on Sunday she and her husband, Jacob Evans, took them down to Drawbaugh's shop, and that Drawbaugh then and there showed them his talking machine—his telephones—and other inventions. She identifies "A," "B" and "D" as instruments which she saw at that time. She remembers her husband and Mr. Drawbaugh talked through the telephone, and that her husband listened.

She testifies further that Drawbaugh told them how many miles he could talk through his telephone; the number, however, she does not remember—"it was a great way, though; he was certain of that; so many miles as he told us;" and that he further said, "if he could get the wires fixed across the ocean, he could talk clear to Europe."

She further testifies that upon her husband's return from Philadelphia, immediately after giving his deposition on behalf of complainants, he told her what he had testified to, and that she thereupon told him it was impossible; that he couldn't remember, and called his attention to the visit of his brother Andrew and two sisters, whereupon he expressed himself as having recollection of the fact himself.

Jacob Evans himself, being recalled (*Id.*, 88), testifies that after the 1st of April, 1876, he never lived in the house opposite Daniel Fettrow's, into which he moved when he first moved to Milltown in September, 1875; that whilst he was living in that house his brother Andrew and sisters Sarah and Jane visited him together; that that visit took place the latter part of November or beginning of December, 1875; that they came to his place on Saturday evening, and went away on Sunday evening or Sunday afternoon some time; that during that visit he remembers of going with them and his wife to Drawbaugh's shop; that Daniel Drawbaugh then and there showed them them his talking machine; that he also talked through it, and thinks that he (witness) listened; and, further, that Drawbaugh then and there said, "that he could use that machine, or talk with that machine across the ocean into Europe; that is, in case he could have the wires stretched up in operation—to a man, the same as him and I was talking there, face to face;" that when he testified for complainants at Philadelphia these facts had slipped his memory; that immediately after his return from Philadelphia his memory was refreshed by a conversation between his wife and himself, in which he told her what he had testified to at Philadelphia, and she called his attention to the visit of his brother and sisters; and that upon his memory being so refreshed, he "well remembered" it, and the fact that he went with them down to Drawbaugh's shop and saw talking machines.

He further states, that with his memory now refreshed, he is able to recollect that he heard of Drawbaugh's talking machine before he moved to Milltown, and he admits that he may have heard of it before he went to work at Etter and Shanklin's mill in 1874.

Tenth.—He is further contradicted by John Simmons (*Id.*, 427), who testifies that in November, 1875, he and Jacob Evans went together to Drawbaugh's shop; that Drawbaugh then and there showed them his talking machine, and talked through it to them; that both of them listened, and laughed whilst Drawbaugh was talking through the machine. He further positively identifies "A" and "E" as two machines which he then and there saw, and says he may have seen "B," "C," "D," "F" and "I."

A feeble and ineffectual attempt was made by the complainants in rejoinder to weaken the force of the Evans testimony by showing, 1st, that Jacob Evans, in the summer of 1883, denied all knowledge of Drawbaugh's talking machine; and, 2d, that Sarah Evans was mistaken with regard to the state of the weather on the day when she visited Drawbaugh's shop in company with her brothers and sisters.

These matters have been discussed in the main brief, and need not be further alluded to here.

Amos Frownfelter (C. Vol. 2, 1225) testifies that he lived at Eberly's Mills from April, 1871, to April, 1874, when he moved to the farm of J. K. Heck, about four miles from Milltown; that whilst living at Milltown he did a great deal of grinding of tools, such as axes, scythes, etc., belonging to the farm on which he lived, at Drawbaugh's shop; that Drawbaugh never showed him any talking machines, and never, before this controversy began, told him that he had any talking machine at the shop, and that he never heard of Drawbaugh's talking machine prior to the spring of 1878, although he was accustomed to go to the store at Eberly's Mills on Saturday evenings, and sometimes through the week.

He does not, however, mention anything that he saw at Drawbaugh's shop.

He is contradicted by:

Augustus Kahney (D. S.-reb., 254), who testifies that he was at Drawbaugh's shop on one occasion when Amos Frownfelter and his mother were there; that he saw them going out of one of the rooms on the second story of the shop, which he entered immediately after; that he then and there saw on a bench or table in that room some of Drawbaugh's talking machines lying in open sight, so that anybody who might happen to be in the room could see them.

He further testifies that Amos Frownfelter's mother was killed by being thrown from a carriage in 1877.

Whether Frownfelter failed to see the talking machines which were lying in open sight, or having seen them, failed to remember that fact, the worthlessness of the negative testimony such as complainants have mainly relied upon is equally well illustrated.

Wm. C. Frownfelter (C. Vol. 2, 1229) testifies that he lived with his father at Eberly's Mills from the spring of 1871 to the spring of 1874; that during that time he was in Daniel Drawbaugh's shop several times—he can't tell how often; on being pressed by complainants' counsel he said he supposed, on an average, once a week; that he was all through the shop; had been in Drawbaugh's private room, and Drawbaugh showed him different inventions of his, but never showed him a talking machine.

He further testified that whilst he lived in Milltown he never heard Mr. Drawbaugh, or any one else, say that Mr. Drawbaugh had a talking machine or was at work on one.

On cross-examination he testified that he first heard of Daniel Drawbaugh's talking machine in the fall of 1879; and further, that he never was in Drawbaugh's shop from April 1, 1873, to April 1, 1877, and never saw any talking machine between those two dates.

He further testified that he knew a man named George H. Rupley, with whom he became acquainted soon after April 1, 1874, and that he had never told Rupley anything about Drawbaugh's talking machine, and had never told him that he had seen it strung on the fence and had heard somebody talk.

When questioned with regard to the machines he had seen at Drawbaugh's shop, he was able to remember nothing but rams, molasses faucets, weather gauges, and an old Dutch clock, which was apparently the skeleton works of Drawbaugh's original magnetic clock.

It must be noted, however, that witness was very young at the time. He moved away from Milltown when fifteen or sixteen years old.

George S. Rupley, being called by defendants (D. S.-reb., 659), testifies that he had a conversation with William Frownfelter with regard to Daniel Drawbaugh's talking machine, in which Frownfelter told him that Daniel Drawbaugh had a wire strung along a fence above his shop, used for the purpose of speaking or transmitting speech, and that this conversation took place some time between April 1, 1874, and April 1, 1877.

Theodore Grissinger (C. Vol. 1, 511) testifies that J. E. Shettel, Jacob H. Grissinger, Daniel Drawbaugh and himself composed the partnership which was started in the spring of 1878, for the purpose of patenting and building Drawbaugh's magnetic clocks; that he had a conversation with Drawbaugh at his shop in the spring or summer of that year, in which the witness in a jesting way asked Drawbaugh why he had not invented the telephone, that it would have paid better than electric clocks, to which Drawbaugh replied that he had done something in that way; that thereupon witness, for the purpose of ascertaining what claim Drawbaugh had to be the original inventor of the telephone, asked him what he had done, and in reply Drawbaugh told him different things he had done, but could show nothing nor give any dates for what he had done; that the impression left on his mind was that Drawbaugh had not done enough far enough back to entitle him to claim the invention, and he was entirely satisfied from what Drawbaugh told him, that he had no claim; that whilst witness was connected with the clock company he was in the habit of going to the shop frequently; that he never talked through a speaking telephone there, or heard anybody talk through one; that during the latter part of the operations of the clock company, Drawbaugh told him there was a pair of telephones connected at the shop, but witness did not speak through them, neither did he examine them.

He identifies Exhibits "D" and "E," and testifies that he saw the former at Drawbaugh's shop, and the latter, or one like it, at his (witness') office at Mechanicsburg.

He denies ever having seen Exhibits "H," "J," or "P," and says that he does not think Drawbaugh ever showed him any of his telephones prior to the conversation above related.

He further testifies that Drawbaugh told him that he had a line from his shop to his dwelling-house, over which he had tried to transmit speech, and could, by speaking very loud, hear a noise, but could not understand; that Drawbaugh said *this was one of his first experiments.*

On his cross-examination he testifies that Drawbaugh told him that he had talked through his telephone, but could not understand, but that he never told him that he had talked through them and had been understood.

The witness, however, does not pretend to give the exact words used by Drawbaugh, but only the impression he received at the time. He further testifies that he asked Mr. Drawbaugh, in the conversation referred to, whether he had any telephone instruments at that time, and Drawbaugh said he did not have any. Witness says this inquiry related to Drawbaugh's old machines that he made in his earlier experiments.

He says that he knew Drawbaugh to be working on improvements in telephones, but that Drawbaugh did not tell him how long he had been so engaged, and witness made no inquiry, because he cared nothing about the improvements.

He does not remember of seeing any telephones at the time of the conversation, although he says it is possible that Drawbaugh showed him one either then or soon after, and he thinks he had never seen any before that conversation.

He thinks the conversation was before Mr. Weaver prepared the application for a patent on the magnetic clock. (May, 1878. See Weaver, Ans. 476.)

He did not see at the shop either "F" or "B," and swears as a fact that he could not have seen them and forgotten it.

He testifies further, that after the first conversation above given he took no further interest in Drawbaugh's telephone, and never paid any attention to it.

Upon being shown "Exhibits A, G, K, L, M, N, O and P," he says that he has seen "A" somewhere, and may have seen it at Drawbaugh's shop, but is positive that the other instruments could not have been there openly.

He saw at the shop one pair of instruments which Drawbaugh had connected there, but does not recognize it among the exhibits.

On examination, it will be seen that his answers, particularly on cross-examination, are contradictory, and many of them manifestly evasive; and it must be noted that he was a member of the clock company which failed to realize a fortune out of that invention.

It is difficult to understand his testimony that Drawbaugh told him he had none of his old machines at the time of the conversation—in the spring or early summer of 1878. If that remark has reference to Drawbaugh's first instruments, his old tea-cup transmitter and its hoop receiver, it is correct. They were probably lost or destroyed long before that time. If it has reference to his subsequent early instruments, it probably was never made, as it is difficult to conceive that Drawbaugh could have any motive for denying the existence of instruments which complainant's own witnesses proved to have been in existence at that time; Shapley and I. D. Landis having seen "B" in October, 1876; Charles A. Landis in

April, 1877; Henry R. Musser shortly before January 31, 1878; George C. Rupp having seen "A" in the winter of 1877-78; Ziegler and Wirt in the early summer of 1878 (at Harrisburg).

But that the witness did know more about Drawbaugh's telephone than he remembers, or at least testifies to, is apparent from the testimony of

F. F. Landis (D. S.-reb. 897), who testifies that in November, 1877, he was at Drawbaugh's shop in company with J. E. Shettel and Theodore Grissinger, that Drawbaugh then showed him, in the presence of Shettel and Grissinger, Exhibit "D," and an instrument closely resembling "H."

Furthermore, complainants' witness Theophilus Weaver testifying with regard to a conversation which he says he had with Drawbaugh concerning a phonographic clock attachment, says that Drawbaugh told him "that he did not feel inclined to let the Grissingers, or party who were partners in the clock, have a footing in that invention unless they would come out fair and square on the clock first" (C, Vol. 1 p. 398, Ans. 91). And thus it may be that Drawbaugh, not being over-confident in the integrity of Grissinger, may have intentionally withheld from him definite information with regard to his telephone experiments.

Edmond C. Harro (C. Vol. 1, p. 945) testifies that he lived at Eberly's Mills for two years, beginning March 1, 1875; that he remembers of Drawbaugh moving his family to Mechanicsburg during that period; that he visited Drawbaugh's family both at Milltown and Mechanicsburg; that he heard Drawbaugh's electric clock talked about in his family, he cannot say how often, nor by whom; that he was at Drawbaugh's shop, and the latter showed him his clock, and explained it to him; he also heard it spoken of by others; that Drawbaugh mentioned to him his instrument for telegraphing without a battery; that he was at Drawbaugh's shop only a few times, however, and had no particular business when he went there.

He further testifies that he never heard Drawbaugh's talking machine spoken of in his (Drawbaugh's) family, nor by any one else about the village, and that he would be likely to remember the fact if he had heard of it.

He is shown instruments " A to Q" except " H, J and P." and says he don't think he ever saw any of them anywhere.

His testimony is commented upon on the main brief.

Daniel Hart (C. Vol. 2, 1512) testifies that he has lived at Milltown for the past fifty years, within 200 or 300 yards from the grist mills; that he heard of Bell's telephone about the time of the Centennial; that he does not know that he had heard before that time that Daniel Drawbaugh had a talking machine or telephone, and that he does not know whether, when he heard of Bell's telephone, it struck him as something new or not. He thinks, however, that if Drawbaugh had had a talking machine that people could talk through, for six or eight years before he heard of Bell's telephone, and it had been common talk in the village for that length of time, that he would have heard of it.

He further testifies that the first time he remembers of hearing of Drawbaugh's talking-machine was soon after Drawbaugh sold the invention, in 1880.

And further, that, although he admits he never went to the shop much, Drawbaugh couldn't have had a talking-machine there, either three or four, or ten or twelve years prior to 1880, unless he kept it hid or in the dark, without his hearing of it.

It will be observed that this deposition, if it proves anything, proves too much, inasmuch as a large number of complainant's own witnesses have distinctly testified to seeing, and some of them, to talking through various talking-machines or telephones at Drawbaugh's shop from October, 1876, down to 1880. This deposition, therefore, furnishes an excellent illustration of the utter unreliability of the negative testimony put in by the complainants in this case.

But Daniel Hart is contradicted:

First. By David H. Good (D. Vol. 1, 505) who testifies (506-7), that in the fall of 1868, he heard Daniel Drawbaugh, in his store, tell two men that he had a talking-machine by which he could convey sound or talk as plainly as he was then talking; and that he could talk to a distance. And one of these men, he testifies, was

"Mr. Hart," whom complainants have assumed to be Daniel Hart (C. Vol. 2, 1513-14, Ans. 15 to 18.)

Second. By William Natcher (D. S-reb., 149), who testifies that whilst he lived in Eberly's Mills (April 1, 1870, to September 5, 1870, and October 17, 1871, to August, 1872), it was generally spoken of in the village of Milltown, that Daniel Drawbaugh had a talking-machine by which he could communicate from one place to another, and among others whom he heard speak of it he particularly mentions Daniel Hart.

Third. By William H. Martin (*Id.* 827) who testifies that in 1870 he worked at building an addition to the house of Daniel Hart; [August and September, 1870. See Abraham May, D. S-reb., 1029, 1030]; that whilst engaged at that work he boarded in the family of Mr. Hart, and then and there heard Drawbaugh's talking-machine spoken of at the table in the presence of Daniel Hart.

Fourth. By George Hosler (*Id.* 367) who testifies that he lived and carried on shoemaking at Eberly's Mills from March 5, 1872, to March 25, 1873; that during that time Drawbaugh's talking-machine was a matter of common and general knowledge in the community, and the subject of general conversation; that it was frequently talked of both in and out of the shop; that his shop was quite a place of resort for people to come in and talk; that Daniel Hart frequently came there, and that from the extent and frequency of the talk in that community at that time about Mr. Drawbaugh's talking-machine invention, he does not believe that anybody could have been in the village and talked with the people very much without hearing something about Mr. Drawbaugh's talking-machine.

David A. Hauck (C. Vol. 1, 786) was a member of the firm of Hauck Bros. & Co., who manufactured faucets at Drawbaugh's shop from July, 1873, until August, 1874. He testified that although he spent a good deal of time there during that period, and although Drawbaugh showed him other inventions, he never saw or heard of the talking machine there at that time.

It appears, however, on his cross-examination that he had a controversy in the patent office in 1879 with Drawbaugh over a measuring faucet, which both he and Drawbaugh claimed to have invented, in which controversy he was adjudged, both by the examiner of interferences, and subsequently, on an appeal, by the board of chief examiners, to have sworn falsely. Both of these tribunals decided that he did not only testify falsely concerning a material matter in the case, but that he had taken a false oath upon filing his application for patent, and that he was not at all an inventor of the faucet in controversy, but had stolen it from his opponent Drawbaugh. Certainly no weight can be attached to his testimony in view both of his hostility to Drawbaugh arising out of the faucet controversy, and of the adjudication by two tribunals constituted by law for the determination of questions of fact, that he had perjured himself. It is, therefore, not deemed necessary to discuss his testimony any further.

Samuel F. Hauck (C. Vol. 2, 1,160) testifies that he was a member of Hauck Bros. & Co., who purchased the machinery, etc., of the Drawbaugh Manufacturing Company; that at about that time he spent several hours at Drawbaugh's shop examining the property of the company, and at that time was all through the shop; that he worked occasionally, in 1873–74, in the shop himself, at different times, for a day or a half a day at a time, and once in August, 1873, four days; that he had occasion to go to the shop for faucets at different times during the latter part of 1873 and the spring of 1874; that his relations with Mr. Drawbaugh personally were very friendly, and and that Drawbaugh was accustomed to show him his inventions, of which he mentions a number; that on one occasion in 1876 or 1877, Drawbaugh asked him how he would like to go into an electric clock; that his relations with Drawbaugh were such that, in his judgment, if the latter had had in his shop a practical speaking telephone capable of being used, which he freely showed to other people, and which were exposed to observation in his shop, he would have known it; and further, that if such telephones had been personally tested and used by a large number of persons who knew of their practical operation and use, he also would have known of their existence and their practical operation and use; and further, that if whilst he was visiting Drawbaugh's shop the latter had had a speaking telephone which was successfuly operated on many occasions in the presence and hearing of many other persons, and knowledge thereof had been freely communicated to the public, he would have known the fact.

Upon being shown the instruments A to Q inclusive he denied ever having seen any of them.

Upon being recalled for further cross-examination, he repeated his former testimony that Mr. Drawbavgh had never said anything to him about telephones or talking machines, and that he never saw any at his (Drawbaugh's) place; and upon being asked to look at A, B, D and C again, he testified that he did not remember ever having seen them, or any of them prior to the institution of this suit.

He further testifies that he was acquainted with David A. Uhrich and Jacob Kimmel, but that he did not remember of going to Daniel Drawbaugh's shop in company with David Uhrich, and remembered of seeing Jacob Kimmel only once at Daniel Drawbaugh's shop, and then David A. Uhrich was not there.

He further denied having any recollection of ever having seen or being shown any telephones at Mr. Drawbaugh's shop in the presence of Uhrich and Kimmel, and that he felt as sure that no such exhibition of telephones to him had taken place as of anything else he had testified to in this case.

He is contradicted:

First.—By Jacob Kimmel (D. S.-reb., 178), who testifies that he was at Drawbaugh's shop, to the best of his knowledge, in 1877, and then and there met Samuel F. Hauck and David Uhrich; that Daniel Drawbaugh then and there showed them his talking machine; that all three were looking on while Drawbaugh was explaining it; that Drawbaugh took it apart and showed them the inside of it; and that thereupon Samuel F. Hauck asked Drawbaugh for a telephone or talking machine to take along home, to put up, which Drawbaugh, however, was not able to give him.

Second.—By David A. Ulrich (*Id.*, 219), who testifies that about the year 1876 he accompanied Samuel F. Hauck to Drawbaugh's shop at Eberly's Mills, and there met Jacob Kimmel; that whilst they were there together at that time Daniel Drawbaugh showed them some of his speaking machines; that Samuel F. Hauck was present and talked to Drawbaugh about the speaking machines at that time.

He further testifies that he at that time saw a large machine and a small one something similar to A and D; and further that he was never at Drawbaugh's shop except upon that one occasion.

George W. Heiges (C. Vol. 2, p. 1089) testifies that on Sunday, the 3d of March, 1878, he accompanied his uncle, George W. Mumper, and cousin, M. J. Bailey, to Daniel Drawbaugh's shop for the purpose of seeing Drawbaugh's electric clock, which Drawbaugh then and there showed them and explained at length. He further testifies that Drawbaugh did not say anything to them on the subject of electric speaking telephones. Upon being shown the Exhibits "A" to "Q," inclusive, he testifies that he never saw any of them at Drawbaugh's shop.

Mr. Drawbaugh, however, appears to have been of the opinion that he did mention the subject to them, inasmuch as the witness testifies that Drawbaugh asked him in November or December, 1881, whether he (witness) remembered of his (Drawbaugh's) saying anything to him upon the occasion of the visit testified to, about his talking machine or telephone, and that he (Drawbaugh) had been to see him (Heiges) at York with regard to the matter.

In the depositions of Bailey and Heiges we have another illustration of the worthlessness of complainants' negative testimony. According to their testimony they were at Drawbaugh's shop March 3, 1878, and did not see any talking machines, nor was the subject mentioned. Nevertheless, according to the testimony of complainants' own witnesses Drawbaugh had talking machines there at time, which he was talking through and exhibiting to others.

According to the testimony of Shapley and I. D. Landis, Exhibit "B," was there as early as October 3d, 1875, and Drawbaugh was so enthusiastic about it that he declared that it was to revolutionize the world and take the place of telegraphing. According to Shapley he had talked through it. According to the testimony of George W. Roe, also, he was at work on the talking machine in October, 1876. According to the Ditlows he was using the talking machine in the spring of 1877 to talk through, and that necessitated not only a receiver but a transmitter. Charles A. Landis saw "B" at Drawbaugh's shop early in April, 1877. Drawbaugh had told Orlando Kahney in the fall of 1876 about his talking machine, and had told him that he expected to make an independent fortune out of it; that he hadn't it patented because he had not the the money to get it patented with. Kahney had heard him talk through it in the winter of 1877-78; so had A. L. Rupp and G. C. Rupp. During the year 1877 Jacob Evans had heard it spoken of about Milltown. H. R Musser had seen several talking machines before January 3, 1878. Drawbaugh had spoken to Lloyd and Worley about it in February, 1878. Several receivers were in existence, "A" as well as "B" (Geo. C. Rupp), and yet Drawbaugh did not show or speak of his talking machine to Bailey and Heiges. The explanation, assuming that he did not (for they might, as others of complainants' witnesses in the case have done, seen talking machine and forgotten the fact) is very simple. They went to his shop for the purpose of seeing his electric clock; they saw it and came away after their curiosity concerning it was satisfied.

John F. Hursh (C.Vol. 1, 1055) testifies that he moved to Kansas in November, 1879; that prior to that time he had resided in Fairview township, York County, Pennsylvania, not far from Milltown; that he had been a member of the Drawbaugh Pump Company, or Drawbaugh Manufacturing Company, from 1867, and that said company ceased manufacturing in 1871; that during that period he was accustomed to go to the machine shop at Milltown at intervals of two weeks or longer; that he had access to, and went to different parts of the building; that he got a ram from Daniel Drawbaugh in May of the Centennial year, and had been, between 1871 and that time, at Drawbaugh's shop, probably at intervals of six months or a year; that Drawbaugh had spoken to him about inventions and machines he was getting up, and had gotten up, and seemed pleased to talk about his new inventions, a number of which he (Hursh) names. He testifies, however, that Drawbaugh first spoke to him about his talking machine in 1878, in or about September, and that he then showed him instruments. Upon being shown "Exhibits" from "A" to "P," inclusive, except "K," he indentifies "B" as one which he saw at that time, and says that he faintly recollects something like "A" and "F," but none of the others. And further testifies that this communication by Drawbaugh to him was after he had heard of speaking telephones elsewhere.

He further testifies that he is "willing to swear that, as a matter of fact," Mr. Drawbaugh did not have electric speaking telephones in his shop at least four years prior to the beginning of the Centennial year (1876), and show them to different persons during those four years (*Id.* 1062, cross-Q. 64); but upon further cross-examination admits all he can testify to is that he did not see the talking-machine there himself prior to 1878. (*Id.* 1064, Cross-Q. 80.)

He is contradicted.

First.—By Abraham Fisher (D. Vol. 2, 688–9), who testifies that along about 1868 or 1869, about a year after Mr. Hursh went into the faucet business, he (Fisher) and John F. Hursh, who is his first cousin, went to Drawbaugh's shop together one evening, when Drawbaugh showed and explained to them his talking machine.

Second.—By Henry S. Magonell (D. S.-reb., 963), who testifies (p. 965, *et seq.*) that before he was married (November 3, 1873) John F. Hursh told him about Drawbaugh's talking machine, and asked him to come along over to Drawbaugh's shop to see it; that this conversation took place about two winters before he was married, and that Hursh spoke to him at different times afterwards about it.

Third.—By Jacob Miley (*Id.* 171), who testifies that John F. Hursh, who is his first cousin by marriage, told him about Drawbaugh's talking machine "in 1873–4 or 1875, along there—I couldn't say now which of the three. It is from eight to ten years ago [November 5, 1883] anyhow; it is not less than eight, and maybe ten, years ago. * * * He came to my place—in the week, Thursday or Friday—and asked me to go with him to Mr. Hertzler's and Drawhaugh's on a Sunday, and the weather being bad on that Sunday we didn't get going. He had stated to me that Mr. Drawbaugh was working at a speaking machine, or talking machine; that is what he called it—talking machine. That is about all; we didn't get to see it." (*Ib.* 171, Ans. 89.)

He further testifies that the idea Mr. Hursh gave him of Drawbaugh's talking machine was that it was to be used for talking from one place to another.

Fourth.—By George W. Atticks (*Ib.* 300), who testifies (302, 303) that he and John F. Hursh, who is his brother-in law, had a conversation about Drawbaugh's talking machine between 1875 and 1877, and that they not only talked about Drawbaugh's talking machine, but also of going up to his shop to see it.

Orlando Kahney (C. Vol. 1, 990) testifies that he moved to the West, April 1, 1879; that prior to that time, from 1871, he lived and worked at various places in the neighborhood of Milltown, among other places at Wilson Walters', which he left some time in 1875; that he was well acquainted with Daniel Drawbaugh

He further testifies that he was at the Centennial Exhibition, October 31, 1876, and several days thereafter; that he first heard of Drawbaugh's talking machine on the second Sunday after he returned home from Philadelphia, when Drawbaugh himself told him about it.

On cross-examination, however, he fixes the date of the conversation in the fall of 1877, instead of the fall of 1876.

He further testifies that Drawbaugh first talked to him through his talking machine some time in the winter of 1877–78.

He further testifies that he saw at Drawbaugh's shop Exhibits "F" and "B," in Drawbaugh's office; that he did not at the time know what they were for; and does not remember whether it was before or after he first heard that Drawbaugh was working on talking machine; and that he may have seen them there more than once; that he never knew what said instruments were for until within a year of the time when his deposition was taken; that he also saw exhibit "A" at Drawbaugh's shop;

whether before or after the fall of 1876 he does not remember; and that he did not know what it was for.

He fails to identify any other exhibits, but remembers of seeing a box with a bell on it, which may have been "Exhibit H." He has no recollection of the instrument that he put to his ear when Drawbaugh talked to him.

It further appears from his testimony that he was frequently at Drawbaugh's shop whilst living in the neighborhoood of Milltown.

He is contradicted by Milton Basehore (D. S.-reb., 116), who testifies that he and Orlando Kahney lived together at Wilson Walter's, in 1875; and that in July of that year, just prior to oats harvest, they went together to Drawbaugh's shop to grind some cradle scythes; that after they had finished grinding the scythes they remained a short time in the shop, and that Daniel Drawbaugh then and there talked through his talking machine, and Orland Kahney listened; and that whilst they were on their way home from Drawbaugh's shop, he (Kahney) discussed the subject of Drawbaugh's talking machine, and that witness gathered from Kahney's conversation that he (Kahney) had known about Drawbaugh's talking machine before that time; that he, Basehore, was never at Drawbaugh's shop before or since that time, and at the time of that visit work on axles was going on in the shop.

Basehore is corroborated as to the time by Wilson P. Walters (*Ib.* 121), who testifies that Basehore and Kahney were working for him in 1875, and that Kahney never worked for him after that year.

Orlando Kahney himself was recalled by defendants (*Ib.* 224), and testified that after he returned to the West from Philadelphia, after having given his deposition there there on behalf of complainants, he reflected further upon the subject of that deposition, and upon reflection remembered that he had seen and talked through Drawbaugh's talking machine at a much earlier date than that fixed by him in his Philadelphia deposition; that he thereupon wrote to Daniel Drawbaugh stating that he now remembered about his talking machine as far back as the year 1875, and that subsequently, March 8, 1883, before the testimony of complainants was closed, he wrote to one of complainants' counsel that since giving his deposition he found that he had made a mistake; that he now believed and knew that there was a telephone at Drawbaugh's shop as far back as 1873, and asking the advice of complainants' counsel as to what course he should pursue; that, receiving no reply to this letter, he wrote again to complainants' counsel on the 23d of May, 1883, again asking direction, but received no reply.

He further testifies that upon reflection he distinctly remembers a visit to Drawbaugh's shop with Milton Basehore, whilst they both lived with Wilson Walters; that they went to Drawbaugh's shop in July, 1875, just before oats harvest, to grind cradle scythes; that after finishing that job Drawbaugh took him into one corner of the shop, and giving him an instrument with wires attached to it, and directing him how to hold it to his ear, went out of the shop, whereupon he heard Drawbaugh's voice through the instrument, and understood what Drawbaugh said through it.

His description of the shape and size of the instrument which he held to his ear leaves little doubt that it was either D or E.

He further testifies that in the fall of 1875, whilst he was working for Joseph Best, he happened to be at Drawbaugh's shop one day, and Drawbaugh asked him if he [Kahney] could lend him $75 or $100 to get a patent on the talking machine.

He further testifies that he remembers of being at Drawbaugh's shop either in 1872 or 1873, possibly 1874 (as he was not able to fix the date accurately), when he saw the same wires in the same place where they were when he ground the cradle scythes, and Drawbaugh used them with the talking machine to talk to him.

Benjamin Kaufman (C. Vol. 1, 939) testifies that he moved to Illinois in February, 1878; that prior to that time for twenty-five years he had lived in or about Eberly's Mills or Milltown; that he had known Daniel Drawbaugh for thirty or thirty-five years; was in his shop whilst the Drawbaugh Manufacturing Company was making faucets, and was accustomed to go to the shop from the time the Drawbaugh Company commenced work until he moved to Illinois "middling often;"

that he met Drawbaugh often at the store and around in Milltown; that Drawbaugh told him about his clocks, but never told him anything about his talking machine, nor showed him any, and that the first knowledge he ever had about talking machines was in Illinois, about a year after he (Kaufman) moved to Illinois, from Jonathan Fry, who "came out from Pennsylvania, and told me Dan was making talking machines."

Upon being shown "Exhibits A to Q," inclusive, except "H," "J," "O" and "P," he testifies: "I never seen any that I know."

The only machines, however, which he appears to remember having seen at any time in the shop are faucets, an electric clock, and a shocking machine.

And it is further significant that the witnes did not know how to write, and was unable to sign his name.

He is contradicted, however,

First.—By his daughter, Mrs. Kate Young (D. S.-reb., 536), who testifies that he (Kaufman) told her about Drawbaugh's talking machine about 1869 or 1870; and,

Second.—By his son-in-law, William Young (*Id.*, 539), who testifies that he heard Benjamin Kaufman speak of Drawbaugh's talking machine "about 1871, or along there, at his home, close by the Gorgas school-house, near Eberly's Mills. * * * He said that Mr. Drawbaugh had invented a talking machine—a machine that you could talk in or talk through."

A. R. Keefer (C.Vol. 2, 1275), division operator of the Middle Division of the Pennsylvania Railroad, testifies that he has known Daniel Drawbaugh for some years, how many he does not know, but should think it is some seven years prior to the date of his deposition, which would make it March, 1876.. He testifies that on one occasion Drawbaugh showed him a telegraph instrument which worked without a battery. He thinks this was in a store near the railroad depot, or in a room in the immediate neighborhood. He has a faint recollection, but is unwilling to state positively, that Drawbaugh showed him the works of the electric clock at one time; that Drawbaugh came to his office on different occasions and got pieces of wire from him, and spoke to him about electrical matters, more especially things which pertained to what Drawbaugh had constructed, but that, to the best of his recollection, he never brought any electric speaking telephones to him, nor did he ever tell him that he was at work, or had been at work, upon any prior to the time when this suit was begun in 1880.

Although the witness, in his tenth answer, admits that it is possible that Drawbaugh did so, the earliest recollection, however, that he has that Drawbaugh ever told him anything on the subject was a remark that Drawbaugh made in the summer of 1881 (almost a year after this suit was begun).

It will be noticed that this deposition, if it proves anything, proves too much. If Drawbaugh could not have had, or was not likely to have had, or been at work upon electric speaking telephones, without the knowledge of this witness, then he could not have had any, or been at work upon any such telephones, prior to the summer of 1881, notwithstanding the fact that Drawbaugh's patent application was filed in July, 1880; and the further fact that a large number of complainants' witnesses have testified to seeing telephones in Drawbaugh's shop in 1876, 1877 and 1878.

George W. Kissinger (C.Vol. 1, 551) testifies that he resided and kept store at Milltown from some time in 1871 to about April 1, 1874; that during that time, although he was in the habit of going pretty often to Drawbaugh's shop, Drawbaugh did not show him, nor did he hear that Drawbaugh had any talking machine or telephone.

It appears from his cross-examination, however, that he is able to remember only a few of the machines which Drawbaugh is well known to have had at that period, and that he admits that he did not take much interest in Drawbaugh's contrivances at the shop whilst he lived there, and when pressed on cross-examination, admits that he cannot swear he did not hear people talk about Drawbaugh's talking machine during the time above mentioned, but only that he cannot recollect hearing anybody talk about it.

The intelligence and reliability of the observation and recollection of this witness may be judged from the fact that he describes Drawbaugh's galvanometer as "a weather-teller." (562 Cross-Q. 107.) His entire unreliability when called upon to testify upon other matters, is fully pointed out in the discussion of the ram testimony (Appendix "A").

He is contradicted, however, by

William Natcher (D. S.-reb., 149) who testifies (150) that he heard George W. Kissinger, who kept store at Milltown, speak of Drawbaugh's talking machine October 17, 1871, to August 9, 1872.

Cyrus Kissinger (C. Vol. 2, p. 1463), George Franklin Kissinger (C. Vol. p. 523), and John M. Kissinger (C. Vol. 1, p. 575), testify that they had their home with their father (George W. Kissinger), at Eberly Mills, from April, 1871, to April, 1874, and that during that time they were occasionally at Drawbaugh's shop and saw some of his inventions, but do not remember of seeing any talking machine there, nor of hearing that he (Drawbaugh) had any. The memory of George F. Kissinger does not appear to be good, and John M. Kissinger was but a lad of fifteen when he moved away from Eberly's Mills. The testimony of all three of these witnesses, so far as it relates to hydraulic rams, is discussed in appendix "A." They do not appear to have taken any special interest in Drawbaugh's inventions, nor to have been on intimate terms with him, nor to have been persons upon whom the talking machine would have made any particular impression if they had seen it.

Isaac D. Landis (C. Vol. 1, p. 606) testifies that on the the 3d of October, 1876, he visited Drawbaugh's shop in company with his brother-in-law, Rufus E. Shapley, for the purpose of seeing Drawbaugh's electric clock; that whilst there he saw "an instrument for speaking through called a telephone." When asked to describe it, he does so as follows: "My recollection of it is being made of tin—apparently a tin can—with a piece of bladder across the end of it, with a magnet attached to it in front of the bladder," and adds, "and also that he (Drawbaugh) said, in calling our attention to it, that this was to revolutionize the world. or words to that effect; that it was for the purpose of speaking through, carrying the sound of the voice." (Ans. 28.)

He further testifies (Ans. 29) that it was not in working order at the time, and identifies exhibit "B" as the instrument which he saw, and says that he saw no other.

He does not remember that Drawbaugh said he had spoken through the instrument, but admits that it might have been said to Mr. Shapley.

He testifies further that it had on it a magnet wound with insulated wire, and that Drawbaugh conveyed the impression to his mind that it was intended to take the place of the telegraph.

Landis and Shapley were jewelers, and had gone to Drawbaugh's shop for the purpose of seeing his clock, in which Shapley was contemplating taking an interest. It is not at all strange, therefore, that Drawbaugh should have omitted to show them his more improved talking machines.

Charles A. Landis (C. Vol. 2, p. 1069) testifies that he was at Drawbaugh's shop some time between March 31st and April 13, 1877; that Drawbaugh then and there showed him exhibits "B" and "F," telling him that they were talking machines, and he saw no others there. The story which he tells of Drawbaugh's explanation of exhibit "B" to him is simply incredible, as he would have us believe that Drawbaugh described it to him as a make and break transmitter, whereas throughout the case, with the exception of this deposition, it has always been assumed to have been a receiver. The witness, however, was quite young at the time, and probably failed to understand what Drawbaugh's explanation was, or, if he did understand, he has forgotten it. His attempt at reproduction of Drawbangh's statement with regard to the repetition of syllables by his talking machine, is another evidence of the entire unreliability os his memory, as also is his statement that exhibit "B" contained no electro magnet, notwithstanding the positive testimony of complainants' witnesses, Shapley and I. D. Landis, to the contrary.

Isaac Lloyd (C. Vol. 2, 1264) and

Frederick U. Worley (*Id.* 1551) testify that they visited Drawbaugh's shop together on the Saturday previous to February 13, 1878; that Lloyd had known Drawbaugh for a number of years, and had induced Worley to go along with him on that occasion for the purpose of seeing Drawbaugh's magnetic clock, and writing an article in regard to it for the Harrisburg Telegraph. This article was published in said paper, February 13, 1878. They saw a number of Drawbaugh's inventions at his shop at that time, but did not see his talking machines. He mentioned it to them, however, as they both testify.

They do not seem to agree exactly upon what Drawbaugh told them. Lloyd says: "To the best of my knowledge he (Drawbaugh) said that he was working on a telephone; that this telephone was worked in connection with an electro-magnet; that the sound produced a kind of 'back-lash;' that he intended to control it by some means that I can't describe to you now." Although he testifies that he had curiosity to see the telephone, and wondered how an electro-magnet could be connected so as to carry sound, yet he did not ask to see it, and Drawbaugh did not show it to him.

Worley testifies that Drawbaugh said, in speaking of the applications of magnetism, that he was experimenting for the transmission of sound, but that while he could produce sound, it was indistinct and confused, and he thought of remedying that by receiving the sound in a box to which he could apply the ear.

He says he cannot give all Drawbaugh's exact words, nor can he give any statements that he made about the talking machine in the exact words that he used, and he, on cross-examination, proceeds to state the substance of all he can remember that Drawbaugh said on the subject. "He had succeeded in transmitting sound, but when it was received in an open room the reverberation made the sounds confused and indistinct. He proposed to remedy that by receiving the sound in a small chamber or box, to which the ear would be applied."

He says further, that he got the idea from Mr. Drawbaugh that up to that time he had received the sound in an open room, and not in any kind of a box which could be applied to the ear, or to which the ear could be applied.

He states that the conversation on the subject of telephones was very brief, and that Drawbaugh did not show them any.

It is to be noted: *First*, That the object of this visit to Drawbaugh's shop was to see the magnetic clock and get materials for a newspaper article about it.

And, *Second*, That in attempting to give a loosely remembered conversation, which they did not at the time understand, they have stated what, on the face of it, is the merest nonsense.

Lloyd had made several previous visits to Drawbaugh's shop, which are commented upon in the main brief.

Davis Major (C. Vol. 1, 848) testifies that he worked for the Haucks at Drawbaugh's shop for about a month in the spring of 1874; that during that time he was in different parts of the shop, and once went with Daniel Drawbaugh into his private room where the latter showed him a clock and two small batteries with wires attached to it, but that Drawbaugh never showed him any talking machines whilst he worked in his shop, and never told him he had any, and he denies ever having seen anything like the exhibits which are shown him, A, B, C, D, E, F and I.

On cross-examination, however, the witness admits that his memory of events was not reliable, and testifies that, in addition to the clock and batteries, he saw in Drawbaugh's private room other things which he calls "rubbish and stuff"—what it was he did not know; that his own work was on the first floor of the building, and that he knew Daniel Drawbaugh was working on the second floor, but did not know what he was working at.

His testimony is further commented upon in the main brief.

James P. Mathews (C. Vol. 1, p. 540) testifies that in April, 1878, he made a visit to Drawbaugh's shop for the purpose of getting material for a newspaper article on Drawbaugh's magnetic clock; that Drawbaugh at that time did not talk to him through any telephone, nor did he see any telephones there completed in working order. It appears, however, that Drawbaugh showed him what witness describes as two wooden hemispheres with pieces of loose wires attached; and further, that Drawbaugh claimed to him to have invented the telephone before either Bell or Edison. Witness states that he got the *impression* from the conversation of Drawbaugh that the latter had entirely thrown aside his telephone experiments;

but he is contradicted in this by complainants' own witnesses, to wit: Shaply, I. D. Landis, C. A. Landis, Olando Kaney, A. L. Rupp, George C. Rupp, Henry R. Mosser and Theodore Grissinger; his recollection of the conversation with Drawbaugh being evidently inaccurate.

Henry R. Mosser (C. Vol. 1, 366) testifies that he wrote a letter to the "Baltimore American," from New Cumberland, Pennsylvania, dated January 31, 1878, in which letter he made mention of Daniel Drawbaugh's electric clock; that shortly before that time he had visited Drawbaugh's shop, and had seen there some electric clocks; and that he had a conversation with Mr. Drawbaugh about an electric speaking telephone, which he states as follows:

Q. 10. Will you state the substance of that conversation?

Ans. My recollection is that he showed me some parts or work that "he said he had been working upon for *some time previous*."

Drawbaugh did not, however, state how long he had worked at them; and witness does not think he said whether he had given up working at them, or abandoned them, or anything in relation to that subject. He frankly admits that he may have heard that Drawbaugh had electric speaking telephones before that time, but he does not remember.

He seems unable positively to identify any of the instruments shown him, and testifies as follows:

Q. 17. * * * * * *

"A. I think I recognize that ['B'] as one or something like one he showed me.

"Q. 18. Do you recognize these two large ones ['H' and 'J']?

"A. I have no recollection of seeing them.

"Q. 19. I now show you all the other original instruments which have been put in evidence by the defendants, and ask you which, if any of them, you saw at that time?

"A. *Mr. Drawbaugh showed me several parts of his telephone, only one of which I definitely seem to remember—that is this one (indicating) 'B.'*"

He further testifies (Ans. 53) that "the conversation on telephones was very brief."

George W. Mumper (C. Vol. 2, 1098) testifies that he lived about a mile and a quarter from Eberly's Mills twenty-eight years, and has known Daniel Drawbaugh twenty-five years; that on Sunday, March 3, 1878, he took his two nephews, George W. Heiges and Mumper J. Bailey, to Drawbaugh's shop to see "the clock that Mr. Drawbaugh had invented, that was to run without winding;" that on their arrival at the shop they asked Mr. Drawbaugh to show them the clock, which he did, and he explained it to them; that Mr. Drawbaugh did not at that visit say anything about telephones or talking machines, nor did he show them any.

Upon being shown Exhibits "A" to "Q," inclusive, he denies ever having seen them at Drawbaugh's shop.

He further testifies that if Drawbaugh had had in his shop a telephone or talking machine six or eight years, and had shown it to a dozen or twenty people, it would have become known in the community.

And further, if it had been generally known in the community, he (Mumper) would have known it, but that he had never heard that Drawbaugh had any such telephone or talking machine up to the date of his visit (March 3, 1878).

He further testifies that if Mr. Drawbaugh, long before speaking telephones were heard of elsewhere, had had at his shop a talking machine by which conversation could be carried on from one place to another along a wire, and had represented that there was a fortune in it, and that it was going to supersede the telegraph, and had demonstrated its usefulness by actual practical use by various persons, and had desired to obtain a few hundred dollars to patent it, offering to give a half or other part interest to those who would furnish the money; that Drawbaugh would have been able to obtain it from his acquaintances or people in the neighborhood; that he (Mumper) would have been willing himself to endorse for Drawbaugh to enable him to raise the amount of fifty dollars.

He further testifies that Alfred Ditlow worked for him five months in 1872, and again in 1876.

On cross-examination, he fails to remember the fact that Daniel Drawbaugh had applied to him for the loan of a small amount of money, and was refused.

He is contradicted by

First.—Joseph Ditlow (D. S.-reb. 521), who testifies (524), that several weeks prior to the time when Mumper gave his deposition, the latter told him that Drawbaugh had his telephone in 1874.

Second.—By Abraham Ditlow (*Id.* 876), who testifies (882) that at the time above fixed by Joseph Ditlow, Mumper said to Joseph Ditlow and himself that he thought it was strange, when he heard they were in Philadelphia and had testified against Drawbaugh; that he "had been up in Daniel Drawbaugh's shop in 1874, and had seen the talking machine, and Dan wanted me to go in partnership with him, and he said 'he was a d—n fool—if he had gone in with Dan he would have made his fortune.'"

Third.—By Alfred Ditlow (*Id.* 820), who testifies that during the year he painted Mumper's barn (1876), Daniel Drawbaugh came into the field at Mumper's and "called Mr. Mumper aside; then Mr. Mumper came up to me, and I asked him what Mr. Drawbaugh wanted, and he said he wanted to borrow some money. Mr. Mumper told him he hadn't the money to spare."

And see the comments upon the testimony of Bailey and Heiges, *supra.*

Michael H. Natcher (C. Vol. 1, 510) testifies that he worked for his father whilst the latter ran the grist mill at Eberly's Mills in 1870 and again in 1871-72; that during that time he was often at Drawbaugh's shop, and saw him (Drawbaugh) every day that he (Drawbaugh) was about home.

He further testifies that he never saw anything like exhibits "B," "F," "C," or "I," and that Drawbaugh never showed him, or spoke to him of any talking machine whilst he (Natcher) lived at Eberly's Mills.

He further testifies that Drawbaugh showed him some few things at his shop, but was able to mention particularly only his faucet and clock.

It will be observed that he was not asked on his direct examination whether he had ever heard of Drawbaugh's talking machine whilst living at Eberly's Mills, and cross-examination was waived.

He was recalled by defendants (S.-reb. 135), and testified that it was true, as he had said in his first deposition, that he had never seen any of Drawbaugh's talking machines whilst residing at Eberly's Mills, but that he had then and there heard of them, and he names four persons whom he recollects of hearing speak about Drawbaugh's talking machine: his brother, George Natcher, his sister, Bella Natcher, his mother, Emiline Natcher, and George Leonard—and he further testifies that there was talk about putting up a talking machine between the grist mill and his father's house.

He is corroborated by his sister, Mrs. Blanche Bella Spangler (*Id.* 176), who remembers of having heard of and seen Drawbaugh's talking machine whilst living at Eberly's Mills, and by his mother, Emiline Natcher (*Id.* 174), who testifies that she heard her son Michael speak of Drawbaugh's talking machine; that it was well-known in their family, and was a good deal talked about in the community.

He further testifies that he told complainants' counsel when the lattter came to see him about his knowledge of Drawbaugh's talking machine, that he had not seen it, but had heard of it whilst living at Eberly's Mills.

An attempt was made to contradict him by the deposition of George Leonard (C. Vol. 3, 2297), who testifies that he never spoke to either of the Natchers, or any other person, about a talking machine, or about putting one in from the mill to the house.

The reason, however, which he gives for this denial is that he knew nothing about the talking machine at that time. But, on cross-examination, it appears that he assumed the time to which Michael H. Natcher's testimony referred to be the first year which he (Leonard) owned the grist mill. (February, 1871, to February, 1872.)

But this assumption was entirely unwarranted by anything contained in the testimony of Michael H. Natcher, and Mr. Leonard further admits that he merely has no recollection about the matter, and does not know that he ever heard anything about the talking machine whilst the Natchers were with him.

William Natcher (C. Vol. 1, 500) testifies that he ran the grist mill at Eberly's Mills, Eberly and Betem from April 1, 1870, to September 5, 1873, and again for George

Leonard from October 17, 1871, to August 9, 1872; that during these two periods he was sometimes at Drawbaugh's shop, as he describes it, "not so very often, but I was frequently there."

He further testifies that Mr. Drawbaugh never showed him any talking machines, and never told him he had any whilst he lived at Eberly's Mills.

On cross-examination he is able to mention four machines or inventions which Drawbaugh showed him or talked to him about during the periods above stated, namely the faucet, hydraulic ram, nail machine and cider machinery, and he omits to mention the electric clock which his son, Michael H. Natcher (C. Vol. 1, 510), called immediately after, remembers to have seen.

He is contradicted by his son, George Natcher (D. S.-reb., 143), who says that whilst living at Eberly's Mills he heard Drawbaugh's talking machine spoken of, and particularly states that his "father (William Natcher), Mr. Drawbaugh and mother (Emiline Natcher) were talking about them."

And, further, that Mr. Drawbaugh and Mrs. Natcher wanted William Natcher to have a talking machine or telephone put up between the house and the mill, but he never had it done.

William Natcher himself, upon being recalled by defendants, testifies (149) that after he had given his deposition on behalf of complainants and returned home, he received through the mail, from John C. Comfort, one of of complainants' agents, a printed copy of his deposition, which he read, and that having read it and reflected further upon the subject. he remembered that he had had heard Drawbaugh's talking machine spoken of whilst he lived at Eberly's Mills. He was then able to mention the names of nine persons whom he had heard speak of it, and testified further that "it was generally spoken of in the little village, or whatever you may call it, of Milltown that Daniel Drawbaugh had a talking machine by which he could communicate from one place to another." And further, that the subject of putting up one of Drawbaugh's talking machines from the mill to his (Natcher's) house was spoken of.

Henry Neidig (C. Vol. 2, 1520) resided on Lake Spring farm, about a mile from Milltown, from the spring of 1870, to the spring of 1877. He employed Daniel Drawbaugh to put in a hydraulic ram on said farm in 1871, and employed him subsequently to do several jobs of work there for him, on which occasion and several other times Drawbaugh was at his farm.

He testifies that up to the spring of 1877, Drawbaugh never told him that he had a talking machine, or asked him to put money into it to help him patent it, and that he never heard prior to that time that Drawbaugh had a talking machine or telephone; that if, before electric speaking telephones had been heard of elsewhere, Drawbaugh had told him that he had talking machines which worked by electricity, and by means of which conversation could be carried on between one place and another, along a wire, and had demonstrated to him that he (Drawbaugh) had such a thing in a really successful condition by having him talk and listen through it, and had pointed out to him that there was a fortune in it, and had told him that he wanted fifty or one hundred dollars to patent it with, and would give an interest in it to anybody who would furnish the money, he (Drawbaugh) would never have had any difficulty in getting the money or a considerable part of it from witness.

But it is not shown that the witness was ever at Drawbaugh's shop. It does not appear that he had any knowledge of any of Drawbaugh's inventions; that Drawbaugh was on terms of any particular intimacy with him, or that the witness was a man capable of understanding or appreciating the talking machine if Drawbaugh had called his attention to it, and explained it, or had even commended it in the strongest terms. And, moreover, the witness' testimony as to what he would or would not have done in the case supposed, is a mere idle expression of opinion concerning circumstances which it is impossible for him fully to realize at the present time—particularly since the commercial value of electric speaking telephones has been demonstrated.

Complainants' attempt in the deposition of this witness another and a startling method of contradicting defendant's witnesses. Henry Herr, Ira D. and Norman W.

Kahney had testified on behalf of defendants, that they had seen talking machines at Drawbaugh's shop at early times. It appeared that Henry Herr was a relative and friend of the witness, and that they were in the habit of meeting more or less frequently from 1871 to 1875; that the Kahneys had both worked for witness on his farm prior to 1877—Ira, about six months, at different times, and Norman considerably less.

Witness is asked to testify, and does testify, that neither of these persons ever mentioned Drawbaugh's talking machines to him.

The inference, which complainants undoubtedly intended the court to draw, being that if these persons had known anything about Drawbaugh's talking machines, they must have mentioned the subject to witness; and thus complainants seek to contradict their sworn testimony that they *did* see Drawbaugh's talking machines.

His testimony is further commented upon in the main brief.

Jacob Neidig (C,Vol. 2, 1235) lived within a mile or two of Eberly's Mills from the spring of 1870 to the spring of 1877. From the spring of 1870 to the fall of 1874 he was at Drawbaugh's shop a good many times; from the fall of 1874 to the spring of 1876 he was there, but not so often as before; from the spring of 1876 to the spring of 1877 he was there, but seldom.

On cross-examination he fails to remember any visit after the beginning of 1876.

He testifies to having seen a number of Drawbaugh's inventions at his shop, but says he never saw any talking machines there, and never heard of any down to the spring of 1877, and he thinks it likely that if there had been any talking machines at Drawbaugh's shop prior to the spring of 1876, he would have known of them and seen them.

It appears, however, that when his more frequent visits ceased in the fall of 1874, he was a mere lad of seventeen years old, and no special opportunity is shown for seeing all of Drawbaugh's inventions.

J. C. Nesbit (C.Vol. 1, 687) testifies that in the summer of 1878, he was employed to write a sketch of Lower Allen township for a history of Cumberland county, Pa., by Rev. Conway P. Wing and others, and published by Jos. D. Scott; that R. P. Hull, then living at Lisburn, was employed to assist to gather information concerning the township, and furnish it to witness; that in pursuance of this engagement he and Hull went to Eberly's Mills between the 1st and 15th of August, 1878; that after having talked with other residents of the place, they went to Daniel Drawbaugh's shop to see and get information from him; that they remained in said shop about an hour, about half of which time witness remained conversing with Hull and Drawbaugh, and during the remainder of that time he walked around the shop whilst Hull and Drawbaugh remained in conversation; that Mr. Hull wrote notes of what he learned that day from Mr. Drawbaugh, and others at Milltown, and when they arrived home at Lisburn just before they separated that same day, Mr. Hull handed the paper to him. He is under the impression that the part of the paper which relates to Mr. Drawbaugh's shop was written at the shop, inasmuch as he and Hull went home together, and he (witness) knows that he (Hull) did not write any on the way home; that he (witness) the same evening wrote out from those notes an article which he sent to the *Herald* office at Carlisle where the history was being printed, and which subsequently appeared in the history; that Mr. Drawbaugh did not tell him, or say in his hearing on that occasion that he claimed to be the first inventor of the speaking telephone.

Complainants produce a copy of said history of Cumberland County, and spread upon the record the article entitled "Milltown or Eberly's Mills," in which Daniel Drawbaugh's shop is spoken of and his measuring faucet and electric clock are mentioned. They also produce and offer in evidence the original notes which Hull gave to the witness on the day of their visit to Drawbaugh's shop (witness testifies that Hull died in April or May, 1879), about half of which are devoted to Drawbaugh's shop, and mentions several of his inventions, to wit: the faucet and electric clock, but makes no mention of his telephone.

On cross-examination, however, it appears that some copies of said history of Cumberland County contain an appendix made up of biographies of prominent persons living throughout the county, whilst others do not contain said appendix. The copy produced by complainants' counsel did not contain said appendix, and notice was given to them to produce a complete copy of said work.

It further appears on cross-examination that complainants had been in search of another paper supposed to have been among the effects of Mr. Hull, containing a biographical sketch of Daniel Drawbaugh, but which they had failed to secure. A paper was then produced by defendants, which was identified by the witness as being in the handwriting of R. P. Hull, and which appeared on comparison with the other manuscript produced, to be written on the other half of the same sheet of paper. Said manuscript appeared to be a biographical sketch of Daniel Drawbaugh, and set forth among his other inventions several kinds of telephones, magneto and voltaic.

At a subsequent session, complainants' counsel produced a complete copy of said history of Cumberland County, which contains a biographical sketch of Daniel Drawbaugh manifestly made from the sketch written by Hull, and like it containing a statement of the invention of several kinds of telephones by Daniel Drawbaugh.

And thus by reason of the fortunate possession of the Hull manuscript by defendants, this attempt on the part of complainants to prove a negative, whilst they had in their hands positive testimony to the contrary, failed.

Edward M. Nichols (C. Vol. 1, p. 852), testifies that he worked for the Haucks at Drawbaugh's shop in 1874; that he saw a number of Drawbaugh's inventions there at that time, but did not see among them any talking machines, nor did he know that Drawbaugh had any there at that time; that he doesn't think that Drawbaugh could have had a talking machine there, and been in the habit of showing it to others at that time, without his (witness) knowing it, and that, if he had known it, he doesn't think he would have forgotten it.

He is contradicted, *First*, by his sister, Mrs. Annie M. Reynolds (D. S.-reb., p. 612), who testifies that she heard her brother, Edward M. Nichols, speak of Drawbaugh's talking-machine in 1874, whilst he (Nichols) was working for the Haucks, and that he said he had seen it at Drawbaugh's shop.

And *Second*, by his mother, Mrs. Leah Nichols (D. S.-reb., p. 731), who testifies that she heard her son (Edward M. Nichols), whilst he was working for the Haucks, say that Drawbaugh was making a talking-machine, or something to talk through,, and that she frequently heard him and his father, Samuel Nichols, one of defendants' witnesses (see D.Vol. 1, p. 238), speak about it.

C. W. Pike (C. Vol. 2, 161) and

Jacob G. May (C. Vol. 2, 1563) were together at Drawbaugh's shop in the fall of 1878, and spent about two hours there, the former testifying that he did not see any talking-machines there, and that he cannot remember and has no recollection of anything being said about them; whilst the latter identifies "Exhibit A," and says that "Exhibit F" seems familiar, and his impression is that he saw it at Drawbaugh's shop. His impression also being that he saw "A" there when he and Mr. Pike were there together, and he further admits that he may have seen "Exhibit H" or "C," but does not remember of having done so. With regard to "D," "E" and "A," he cannot positively say that he has seen them.

George W. Row (C. Vol. 2, 1533) testifies that up to the spring of 1876 (when he was about fourteen years old) he had always lived at Eberly's Mills; that during that year he worked as a hireling for John H. Stephens, who had testified on behalf of defendants (D. Vol. 2, 260); that in October, 1876, the latter told him he had been down at Drawbaugh's shop the night before, and that Drawbaugh had then told him that he was making a talking-machine to talk from one place to another by a wire.

Complainants endeavored to get the witness to say that Stephens further told him that he first knew of Drawbaugh's talking-machine upon the evening referred to, and partially succeeded, by means of an artfully worded question, but upon cross-examination he admits that Stephens did not tell him whether or not he had seen Drawbaugh's talking-machine long before the evening referred to, nor whether or not that was the first time Drawbaugh had spoken to him about the talking-machine.

It was, however, meant by the complainants as an attack upon Stephen's testimony, and they were endeavoring by their use of negative and inferential evidence to show that Stephens was mistaken in his dates, and defendants felt called upon to meet it, which they did by the testimony of Henry Otstot (D., S.-reb., 360), who testifies that he was twice in Daniel Drawbaugh's shop at Eberly's Mills, the last time on the day of George Heck's sale, which took place September 13, 1873 (see John B. Heck, D. S.-reb., 893); that upon that occasion he did not see any talking machines, but that he had been there in company with John H. Stephens several years before in the fall of either 1870 or 1871, when he did see a talking machine there, and he identifies Exhibit "C" as one which he then and there saw.

It thus appears that John H. Stephens, instead of testifying too strongly for defendant, as complainants endeavored to make it appear, had testified in a very guarded manner, and had abstained from fixing his dates as early as he might have done.

Abraham L. Rupp (C, Vol. 2, 1111), testifies that he lived on Lake Spring farm, about a mile and a half from Milltown, up to the spring of 1870, when he moved to Shiremanstown, and lived in and about that place until the spring of 1877, when he returned to Lake Spring farm.

He appears to have bought a fodder cutter December 3, 1877. He testifies that soon after he purchased it, and during the winter of 1877-8, he went to Drawbaugh's shop to grind the knives belonging to it, and that Daniel Drawbaugh then and there talked to him through his talking machine. He does not remember what led Drawbaugh to show it to him, nor what conversation he and Drawbaugh had about it, but merely that Mr. Drawbaugh took him downstairs (he thinks into the basement), and that he there put his ear close to the machine at which he listened, and which he thinks was resting on a table or bench, and thus heard Drawbaugh talk.

He testifies further that he had heard Mr. Drawbaugh speak through it, but that he has no recollection of seeing the instrument into which Drawbaugh talked. Upon being shown Exhibits "A to Q," inclusive, all the original instruments offered in evidence—he is unable to identify any of them, and says he has no recollection of seeing any of them, and further, that none of them looked familiar to him. (Cross-Ans. 79.)

He testifies that he never had heard before that time that Drawbaugh had a talking machine.

He further testifies that he does not know where Drawbaugh was when he talked; that he might have had some idea at the time where he was, but has no recollection now; that he did not ask Drawbaugh, and he doesn't know how the telephone was operated; and that he didn't take any more interest in the matter than merely "to listen at one end of it."

Having taken so little interest in the matter, and having such a dim recollection of what he did see and hear, it might be supposed that complainants would have refrained from calling upon him to express any opinions upon it; but they did not, and he was made to testify that, if Mr. Drawbaugh had had at his shop for six or eight years before his visit a talking machine by which people at different places could talk to each other along a wire, and had been in the habit of freely communicating knowledge of it to the public, and showing it generally to people at his shop, he thinks he, too, would have known it.

And, further, that if Mr. Drawbaugh, for five or six years before speaking telephones were heard of elsewhere, had at his shop a talking machine by which people at different places could carry on conversation with each other along a wire, and had freely shown it to people, and had them carry on conversation over it, so that they knew it would do what he claimed for it, and had represented that it was going to supersede the telegraph, and that there was a fortune in it, and that he was ready to give a part interest in it to whoever would provide a few hundred dollars to patent it and start making the instruments, in his opinion he (Drawbaugh) would have been able to raise the money in the neighborhood.

His testimony is further commented upon in the main brief.

George C. Rupp (C. Vol. 2, 1122) testifies that he lived in the neighborhood of Eberly's Mills up to January, 1881, with the exception of the year, 1876, when he was in Indiana: that prior to the spring of 1877, he had been at Drawbaugh's shop at Eberly's Mills some, but not as much as after 1877; that in the winter of 1877, 1878, he went there for the purpose of sharpening knives on a fodder-cutter, and that Daniel Drawbaugh then and there showed him his talking machine and talked through it to him, and that he heard Drawbaugh speak through it.

He thinks, although he is uncertain, that the instrument he saw had the mouthpiece on one side, instead of at the center, and picks out exhibit "A," as the one most nearly resembling it. He testifies that he had never seen any talking machine at Drawbaugh's shop before that time, and had never heard that he had one.

Upon cross-examination he inclines to say that he was never in Drawbaugh's shop at any time within five years before December, 1877.

His testimony is further commented upon in the main brief.

William Sadler (C. Vol. 1, 1036) testifies that he has lived within a mile and a half of Drawbaugh's shop at Milltown since 1836; that he was connected with the Millbush Company which had considerable work done by the Drawbaugh Manufacturing Company, that from about June, 1868, until some time in 1869, he was in the habit of going to Drawbaugh's shop at Milltown to look after the work; that he had been during that time in Drawbaugh's private office; that he was at Drawbaugh's shop again in the latter part of June, 1876, on business, and at other times between the beginning of 1868, and the summer of 1876; that Drawbaugh never showed him a talking machine, and never told him he had one; nor did he ever know that Drawbaugh had a talking machine before the year 1880.

Complainants in this deposition attempt a remarkable piece of inferential testimony. The witness testifies that his son, Jacob M. Sadler, was in partnership with Daniel Drawbaugh from, he thought, some time in 1871–72, he didn't recollect which, in the business of putting in hydraulic rams, and during that time his son lived at home with him, yet he never heard his son say anything about Drawbaugh's telephone until some time in the fall of 1880. (Jacob M. Sadler died December, 1880.)

Witness further testified that Drawbaugh "could not have had speaking telephones at his shop from 1869 to 1876, and been in the habit of showing them to people generally, who came in, and communicating knowledge of them freely to the public during those years without "his knowing it" (*Id.* 1045, Ans. to Q. 43); and substantially (*Id.* Q. 44) that he could not have heard of Drawbaugh's telephone and forgotten it.

On cross-examination he testified that whilst his son was in the ram business with Mr. Drawbaugh, about 1871, he had good opportunities for seeing and knowing of Drawbaugh's talking machine if it existed at the time. And, further, that if his son had known anything about it he would have mentioned it to him, and that he (Wm. Sadler) could not have forgotten it if he had heard of it. (*Id.* 1049, Cross-Q. 110 to 113.)

Defendants then produced the affidavit of J. M. Sadler, taken a short time before his death, which is as follows (C. Vol. 1, 1050):

"Cumberland County, *ss.*

"Before me, the subscriber, a justice of the peace in and for such county, personally appeared J. M. Sadler, who, being duly affirmed, says: In the year 1871 I was engaged with Daniel Drawbaugh in the manufacture and sale of hydraulic rams. At that time, to the best of my recollection, he spoke to me about his talking machine. He showed it to me, but I don't remember what it was like. I know there were two machines connected by wires. He spoke through it to me, and I understood distinctly the words he said. I repeated to him the words he spoke, and he said they were right. I recognized the voice as his; it sounded like his, I remember that distinctly. He said his invention would take the place of telegraphing, and that it could be used to speak at long distances.

"In the manufacture of hydraulic rams I furnished the capital, and Drawbaugh made them. He was poor at that time and generally hard up.

"J. M. SADLER.

"Affirmed and subscribed before me, this thirtieth day of June, 1880.

"JOHN F. LEE, J. P."

The witness was disposed to deny his son's signature, but the signature and the execution of the affidavit were subsequently proven by the justice. (See Lee D. S.-reb., 211). And the fact that Jacob M. Sadler well knew of Drawbaugh's talking machine, was proven by John F. Keepfauver (D. S.-reb., 837) who testifies (841 *et seq.*) that he and Jacob M. Sadler went together to Drawbaugh's shop in April, 1873, and talked through the talking machine from the attic to the cellar, and by Benjamin F. Zimmerman (*Id.* 822), who testifies (823, Ans. 8, 9) that at the time Jacob M. Sadler was engaged with Drawbaugh in the ram business, he heard him (Jacob M. Sadler) say "that it was no use to try to do anything with Dan Drawbaugh for that he was always working with that d—n talking machine."

William Sadler is contradicted by

Jacob Barber (D. S.-reb., 371) a man of very high standing in Cumberland County, who served eight years as one of the commissioners of said county, and filled other public offices, and who testifies (*Id.* 374, Ans. 18 to 21) that he heard William Sadler speak of Daniel Drawbaugh's talking machine several times whilst he (Sadler) was also commissioner (1876 to 1879), and by B. F. Zimmerman (*ut supra*), who testifies that he heard William Sadler speak of Drawbaugh's talking machine some time between 1868 and 1873, at a public sale in Milltown, the exact date of which he is unable to fix.

Rufus E. Shapley (C. Vol. 1, 587) testified that he went to Drawbaugh's shop, October 3, 1876, in company with his brother-in-law, Isaac D. Landis, for the purpose of seeing Drawbaugh's electric clock; that whilst there they saw lying on a table near the clock an instrument which Drawbaugh called a telephone. He identifies Exhibit "B" as said instrument. He says that he "understood Mr. Drawbaugh to say that he had it up around the shop," and in his 28th answer, "I think I understood Mr. Drawbaugh to say that they had spoken with it, but I don't remember that he made any remark of any use that would thereafter be made of it." He does not remember to have seen any other telephone instrument there, but he says they were only on one floor of the shop, and that their time was limited (Ans. 21), and again, "our time was very short there" (Ans. 32). He testifies further that he was at that time contemplating taking an interest in the clock, and the purpose of his visit was to examine it with regard to that object.

Theophilus Weaver (C. Vol. 1, p. 376) testifies that he was at Drawbaugh's shop on several occasions from 1867 to 1876, and there saw a number of Drawbaugh's inventions; that he met Drawbaugh elsewhere a number of times during that period, and conversed with him about various inventions; that during that time Drawbaugh never told him he had a talking machine, or exhibited to him any such machine; that in May, 1878, when Weaver was employed as solicitor to take out a patent upon Drawbaugh's magnetic clock, in a private interview the latter first told him about his talking machine. The attention of the court is particularly directed to the language in which Weaver relates this interview. "in one of those private interviews," *then he alone being present with me*, he stated he too had experimented on the electric telephone years ago, *and before Bell came out with his invention*, and that he had some results, but that they were not of such a satisfactory nature as to go ahead at the time with his experiments; that he had given up his experiments for the time being, and now it was too late for him to hope to have any standing as the inventor of the electrical telephone (Ans. 90), and that he had nothing to show how far he had gone in his earlier experiments. (Ans. 95 and 313.) He states that the *impression left upon his mind* was that Drawbaugh obtained no good results from those early experiments, because country people ridiculed him so much about it, and that he (witness) *thought* that if he (Drawbaugh) had obtained any satisfactory results that country people would have applauded him; he testifies that it is his impression from the conversation of Drawbaugh that he (Drawbaugh) was working on a talking machine a good while, and that he understood that his (Drawbaugh's) experiments were before Mr. Bell came out with his telephones, and that he (Drawbaugh) had experimented a good deal. He did not, however, specify what his experiments were, and witness did not ask him what they were. Drawbaugh did not tell him when he first went to work at telephone experiments, but said it was long ago, and said that his crude experiments were before Bell came out—a good while before Bell came out, although the date of Bell's patent was not mentioned. (Ans. 524–525.)

Witness did not ask Drawbaugh what his results were, but says that Drawbaugh told him that he had given his telephone experiments up, because they were not fairly practical and successful, and because he was ridiculed by the country people. He states that it is his *impression* that Drawbaugh told him he was much opposed and laughed at by the people; that his experiments were not altogether successful; that he had some results when he gave it up; that he did not go far enough, but that he still could get up and patent some improvements (Ans. 495–533). The witness, however, mixes up Drawbaugh's telephone and clock experiments to such an extent as to render it almost impossible to separate them. He mingles his impressions and opinions with Drawbaugh's statements in such a way that it does not clearly appear what Drawbaugh did say to him. His deposition is a long one, covering 125 pages, and it is not proposed to give it here at length. In his cross-examination he seriously damages his testimony in several respects. First, by his contradictory statement (and it is impossible within the limits of this brief to even refer to them). Second, by his admission that he was the paid agent of the complainants, who had early in the case sought him out as a person likely to aid them; and third, by his admission that he had on several occasions shown great hostility to Drawbaugh.

His cross-examination throughout showed that he was a man of great vindictiveness and unscrupulousness, and that smarting under slights which he imagined himself to have received, he had on several occasions attempted to injure Drawbaugh and his associates, and to prevent the manufacture and sale of Drawbaugh's inventions, and that he had desisted from such conduct when threatened with legal proceedings. It is impossible to read his cross-examination without being impressed with his hostility to Drawbaugh, and the general low tone of his character and conduct.

Indeed, so far did he discredit himself that the complainants considered it necessary to bolster up his character and conduct in an irregular manner by proof, not of his general good reputation for honesty and truthfnlness, but that he had acted honestly on several occasions.

As to his statement that Drawbaugh had nothing to show for his earlier experiments, see remarks on Theodore Grissinger, *supra*.

James C. Zimmerman (C. Vol. 1, p. 622) testifies that he lived at Eberly's Mills about six or eight months in 1871, and in its vicinity for a year or two longer; that during that time he was at Drawbaugh's shop "only a few times"; that he saw some of Drawbaugh's inventions there, but to the best of his knowledge, did not see any talking machines, nor did Drawbaugh tell him that he had any such machines. It is not necessary to comment on this testimony, as it does not appear that Zimmerman had any special opportunities for seeing the talking machines, and he seemed unwilling to say positively that he had no knowledge of them. After the lapse of a year from the close of their rebutting testimony, complainants having been able to find three more witnesses who knew nothing of Drawbaugh's talking machine prior to 1880, called in their rejoinder, John Kahney, Simon C. Wilson and George Ditlow.

John Kahney (C. Vol. 3, p. 2,033) testifies that he lived at Eberly's Mills from the spring of 1871 until the spring of 1875, since which time he has lived within a mile of that place; that whilst living there, and since he moved away, he has frequently been in Drawbaugh's shop, and has seen different inventions there, but that he never saw there any talking machines, and never knew that Drawbaugh had any until he was told by his son that Drawbaugh "had sold out his interest in the telephone to the Telephone Company," and this he says was that after the spring of 1879. (The sale of Drawbaugh's interest in the telephone occurred in July, 1880 (C. Vol. 1, p. 101.)

The deposition of this witness proves too much, inasmuch as if it proves that telephones were not at Drawbaugh's shop before 1876, it also proves that they were not there after that date.

Three sons of this witness, Ira, Norman W. and Augustus Kahney, had testified in behalf of the defendants that they had seen talking machines at Drawbaugh's shop prior to 1876; and the fourth son, Orlando B. Kahney, had testified, when called by complainants, that he knew of Drawbaugh's talking machine in the fall of 1876, and subsequently, when recalled by defendants, that he saw and talked through a talking machine at Drawbaugh's shop in July of 1875.

To contradict these witnesses, John Kahney was asked by complainants whether he had ever heard Drawbaugh's talking machine spoken of in his family, to which he replied that he never had until told that Drawbaugh had sold it. The extremely far-fetched inference which, no doubt, complainants wish to draw from this testimony is entirely destroyed by the fact that witness' son Orlando had already testified, when called by complainants, that he knew of Drawbaugh's talking machine in the fall of 1876.

Simon C. Wilson (C, Vol. 3, p. 2,058) testifies that he was at one time a telegraph operator, and had charge of a small telegraph repair shop belonging to the Northern Central Railroad Company, at Harrisburg, Pa., from December, 1870, to the latter part of 1876 or 1877; that on several occasions Drawbaugh came to said shop, and was allowed to have telegraphic material from the scrap pile; that Drawbaugh at one time showed witness an electric clock, and at another time an instrument for telegraphing without a battery; but he never showed him any talking machine, nor told him that he had invented such a machine. A number of hypothetical questions were put to this witness by complainants, who sought to show that if Drawbaugh had had a talking machine, for example, in 1873, that J. D. Cameron, the president, and J. N. DuBarry, the general superintendent of the Northern Central Railroad Company, would have taken half of it. Witness testifies that he feels satisfied "*that when they came to understand the invention* they would have gone into it."

Complainants considered it important to put upon the record the fact that the full name of this witness is Simon Cameron Wilson. It does not, however, appear that this witness was ever at Drawbaugh's shop, or that he had been on any particular terms of intimacy with Drawbaugh, and certainly his opinion as to what Drawbaugh and others would or would not have done under certain circumstances is not entitled to any weight.

George Ditlow, (C. Vol. 3, p. 2,122) testifies that up to 1875 he lived at Eberly's Mills, and was accustomed to go there frequently to the post-office and store; that he knew most of the people at Milltown, but that he never heard, whilst living there that Daniel Drawbaugh had a talking machine.

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Supreme Court of the United States.

THE PEOPLE'S TELEPHONE COMPANY ET AL.,
APPELLANTS,
vs.
THE AMERICAN BELL TELEPHONE COMPANY ET AL.,
APPELLEES.

THE OVERLAND TELEPHONE COMPANY ET AL.,
APPELLANTS,
vs.
THE AMERICAN BELL TELEPHONE COMPANY ET AL.,
APPELLEES.

APPEALS FROM THE CIRCUIT COURT OF THE UNITED STATES FOR THE SOUTHERN DISTRICT OF NEW YORK.

OPENING BRIEF FOR APPELLANTS ON THE DRAWBAUGH EVIDENCE.

LYSANDER HILL,
GEORGE F. EDMUNDS,
DON M. DICKINSON,
Of Counsel.

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It is conceded that the earliest and latest machines claimed by the defense to have been conceived and constructed by Daniel Drawbaugh, which did transmit articulate speech, operated on the principle which has been applied under the Bell patents.

The principle is, that of transmitting articulate speech upon wires by a continuous electric current, with the addition of means to cause incidental undulations of the current corresponding with the incidental tones of the human voice.

When applied in the electric speaking telephone the practical result is, that the same air vibrations set in motion by the human voice, and producing sound by their impact upon the tympanum of the ear, are repeated with comparative exactness upon the tympanum or diaphragm of the transmitting instrument, are then by the process carried to a distance, and there with equal exactness repeated upon the tympanum or diaphragm of the receiver, and thence again repeated upon the tympanum of the listening ear.

THE ISSUE.

At the beginning and the end of the controversy, through the entire mass of learning and material accumulated on either side, appears and runs the single question:

Did Alexander Graham Bell or Daniel Drawbaugh first conceive and apply this principle, and 'clothe the conception in substantial forms which demonstrated at once its practical efficacy and utility?'

This court has clearly laid down the lines within which legal evidence can solve the question in favor of Drawbaugh.

Extended citations are unnecessary, because the rules settled by judgments in two leading cases applying here, have never been departed from or varied. These are the Fire Proof Safe case and the Reversible Lock case.*

In the former, Connor was a business man, and constructed for himself a safe, containing metal walls with plaster-of-paris between. He used it in his own business only, and finally, selling out, the safe disappeared. He never applied for a patent, and never made another safe; neither did he communicate the knowledge of its construction to the public. Of course, such was its construction that a person seeing it could derive no information in respect of construction, the patentability of which was in issue. There was no evidence that Connor had ever tested the safe, to see whether or not it was fire-proof.

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*Gaylor v. Wilder, 10 How. 477; Coffin v. Ogden, 18 Wall. 129.

This court says: " We do not understand the Circuit " Court to have said that the omission of Connor to try his " safe by the proper tests would deprive it of its priority; " nor his omission to bring it into public use. *He might have* " *omitted both, and also abandoned its use and been ignor-* " *ant of the extent of its value; yet if it were the same* " *with Fitzgerald's, the latter would not upon such grounds* " *be entitled to a patent ;* provided Connor's safe and its " mode of construction were still in the memory of Connor " before they were recalled by Fitzgerald's patent." Justices McLEAN, DANIEL and GRIER dissented, on the ground that it was immaterial whether Connor had forgotten the mode of construction or not ; the soundness of the proposition, that it was material that Connor should remember it, was, explicitly, *not* endorsed in the later case next referred to.

In the Lock case the defense was that one Erbe had made the same and a prior invention. *It was of rough wrought iron, but capable of working.* That about six months afterwards, he had made two locks similar to the first, but had never made another, except one some seven years after the patent in suit was issued, and after the suit was instituted. Four witnesses only, including Erbe, were examined to sustain the defense. Erbe testified that he made a lock in the latter part of 1860, and *thinks it was applied to a door, but was not certain.* Brossy, a workman, testified to seeing the lock at Erbe's house, and to seeing it afterwards, or one like it, on a door in the shop. Another workman testified that Erbe showed him the lock early in the year in which the patent in suit was issued, and another workman testified that Erbe showed him the lock about the same time, and that as it was their custom to test new locks on a door, he believed that this was so tested, *but could not say positively that such was the fact.* All four gave their testimony between eight and nine years after the events occurred of which they testified.

The lock was never manufactured by the firm for whom Erbe was working, nor was there any evidence that Erbe ever triedto induce the firm for which he was working (lock manufacturers), or anybody else, to adopt it, or ever tried to manufacture or sell it himself. There was no evidence as to how successfully the lock worked when tested on a door, although if it were like the alleged reproduction, manufactured pending the suit, it would undoubtedly have worked successfully. The rule in such cases, as stated by the Supreme Court, is as follows: "The invention or "discovery relied upon as a defense must be complete, and "capable of producing the result sought to be accomplished; "and this must be shown by the defendant. The burden of "proof rests upon him, and every reasonable doubt should "be resolved against him. If the thing were embryotic or "inchoate; if it rested in speculation or experiment; if "the process pursued for its development had failed to "reach the point of consummation, it cannot avail to defeat "a patent founded upon a discovery or invention which "was completed, while in the other case there was only "progress, however near the progress may have approxi-"mated to the end in view. The law requires not con-"jecture, but certainty. If the question related to a "machine, the conception must have been clothed in sub-"stantial form, which demonstrated at once its practical "efficacy and utility. (*Ried* v. *Cotter*, 1 Story, 590.) The "prior knowledge and use by a single person is sufficient; "the number is immaterial. (*Bedford* v. *Hunt*, 1 Mass.

"302.) Until his work is done, the inventor has given "nothing to the public."

The court proceeds to quote the language in *Gaylor* v. *Wilder*, hereinbefore given, and then says: "Here "it is abundantly proved that the lock originally made "by Erbe was complete and capable of working. The "priority of Erbe's invention is clearly shown. It was "known at the time to at least five persons (including "Jones), and probably to many others in the shop "where Erbe was working; and the lock was put in "use, being applied to a door, as proved by Brossy. "It was thus tested and shown to be successful. Those "facts bring the case made by the appellees within the "severest legal tests which can be applied to them. The "defense relied upon is fully made out."

We shall submit that the Drawbaugh defense is at every point so within and distant from the confines here drawn, that, tested by these judgments, there is no attack made by complainants which has reached, or can reach it.

The policy of the law is to give the utmost possible encouragement and protection to the inventor — not the patentee.

That of which we have heard so much, of the vast amounts invested under the Bell patents; the large expenditures made in perfecting them; the hosts of people who have their "all" invested on the faith of them, as well ss the reflections upon "unscrupulous speculators," said to be behind Drawbaugh, cannot add the gravity of a feather in weighing the matter of priority of invention; such matter has no place in the balance, as legal evidence, and cannot obstruct for one moment the legal path at the end of which stands the Inventor of the Electric Speaking Telephone.

THE DATE OF THE CONCEPTION AS TO WHICH WE ALLEGE PRIORITY.

We can safely assume at the outset, that the evidence and considerations heretofore presented and discussed by our learned associates in this defense, establish that the date of Mr. Bell's alleged invention can be fixed no earlier than March 10, 1876; certainly no earlier than February 14, 1876; but for the purposes of the Drawbaugh defense, we may safely set the date of the conception by Bell at the day of the accident on the ~~Harp~~ spring machine, and which he absolutely fixes as having occurred on June 2, 1875. (See his letter of that date, *Cross-examination, II. Complainants', p. 1,695; Complainants' Exhibits, p. 1,005.*)

Previous to this he had even abandoned experiments with the diaphragm, and it was not until the 28th day of December, 1875, in his interview with Mr. George Brown, of Toronto, Canada, that he drew a sketch of his July, 1875, instrument predicated upon his experiments subsequent to the accident of June 2, 1875, and placed upon it these words in his own handwriting: "*First attempt to transmit the human voice.* The varying pitch of voice could be discriminated, but not the quality. A sort of muttering effect was perceived at the other end." (*Complainant's Ex., p. 1,013*). And so, though the evidence permits us to place the date of Bell's invention months later, and although for the purpose of this defense it may be placed months earlier, we fix the

EARLIEST DATE OF BELL'S INVENTION, JUNE 2, 1875.

We present a history from the first idea conceived by Drawbaugh, of transmitting articulate speech over a telegraph wire in 1859–60, through various experiments by which the conception finally took on mechanical, though rude forms, and became of practical use, down to the finished and nicely-adjusted mechanism; all prior to this as the date of Bell's invention.

As briefly as we may, we shall discuss this history and the evidence, under the following heads, in their order:

I. THE NATURE OF DEFENDANTS' EVIDENCE, ITS CHARACTER AND LEGAL EFFECT, AND THE CRITICISMS UPON IT.

II. COMPLAINANTS' EVIDENCE ANALYZED.

III. GENERAL CONSIDERATION OF DRAWBAUGH AS AN INVENTOR, AND THE ERRORS OF THE CIRCUIT JUDGE IN RESPECT OF HIS MENTAL EQUIPMENT AND STORY.

IV. THE CREDIBILITY OF DANIEL DRAWBAUGH, IN THE LIGHT OF HIS TESTIMONY, HIS HISTORY AND SURROUNDINGS.

V. DRAWBAUGH'S CONCEPTION AND INVENTION OF THE TELEPHONE.

VI. DEFENDANTS' PROOFS ANALYZED.

I.

This history rests for its general truthfulness, and for the accuracy of its details, not upon the testimony of interested witnesses; not upon the testimony of one, two, six or a dozen, but upon the direct and positive testimony of an entire community, and of the frequent and occasional visitors to that community, representing all classes of citizens, in every trade and occupation.

Over two hundred persons testify to knowledge of Drawbaugh's telephones as an accomplished invention prior to the date of Bell's. Over seventy talked through the machine. Over one hundred and thirty saw the machines, and most of these identify instruments.

There is nothing of inherent improbability in the proposition that so many people of various occupations and employment can give direct testimony in this case, as the fact comes in naturally, and is conceded on all sides, that in the country village of Eberly's Mills, well known throughout that part of the country, Drawbaugh's shop was a common resort for many people of the village and of the country side, and it was a place to which visitors were frequently taken as a place of local note; while Drawbaugh himself was considered a remarkable man among the people.

The great mass of evidence for the defense is essentially not of a class frequently criticised in such cases as being dependent upon the memories of illiterate or careless witnesses as to conversations, statements, or even plans and specifications with or submitted by an alleged inventor at some former time; but on the contrary is that kind of testimony which in every branch of the profession is admitted to be even superior to that of the mere learned or scientific, where it bears upon the practical truth of novel results and effects as facts. There is no room for mistake.

It cannot be conceived that any honest witness could have made a mistake, or that his memory could be beguiled by imagination, "wrought upon by influences to which his ears were subjected," as to his having done so marvelous a thing as conversing through a machine and recognizing the tones of a human voice, at a distance over telegraph wires, at the time in question.

In the condition of the art, and of their knowledge at the time, a greater proportion of such witnesses would be impressed by such a fact as by a miracle.

So strong and vigorous was this class of testimony that the court below was constrained to hold that "The "case made by these witnesses is sufficiently formidable to "overcome the legal presumption of the validity of the "complainant's patent."

It is true that in all branches of jurisprudence instances are frequent in the cases, and illustrations common in the books, of the fallibility of direct testimony, from honest mistake.

Such instances and such illustrations occur and are drawn, throughout the history of the law of evidence, from one general class of Oral testimony.

It is that which depends for credence upon the unaided memory of the witness, in relation to some ordinary thing, not unusual, unnatural or striking, in and of itself. Thus, the testimony of an honest witness to the fact merely, that at a certain time and place, he saw two individuals together, might be successfully assailed, while the statement of the same witness that he saw them together, and saw one of them strike the other or shoot the other, would be invulnerable.

So, by the same rule, direct testimony by the average witness as to ordinary conversations or statements at a distance of time, may be as unreliable as his recollection of the contents in detail of a letter, which, intrinsically, or to the witness, was of no particular interest; in both instances becoming less reliable in proportion to the lapse of time. Such evidence, while it may be competent, has little weight.

So, memory of such witnesses as to statements, and plans and sketches of inventors in ordinary machinery, or extraordinary machinery used for ordinary purposes; and even as to the parts and adjustment of the mechanical parts of such machines.

The history of patent litigation, the judgments of courts in such cases, and the complainant's brief below and here, teem with modern instances of the application of proper caution and of absolute decision against this kind of direct evidence.

It is doubtless true that the misty and lineless impressions of men, especially of the unskilled and unlearned in the art, might easily be beguiled by subsequent events, interest or influences, into giving out a seemingly honest but mistaken description of well-defined parts and accurate adjustments. Strong circumstantial should overcome direct evidence in such cases, as in the Howe Sewing Machine cases.

1 Fisher, 162.

But the testimony here attacked is as far beyond the range of that doctrine as the target of a Columbiad is beyond the range of a bird gun.

Other and equally well settled rules apply. If the circumstances narrated were likely to attract the attention of a person "In consequence of their importance, either "intrinsic or with relation to himself," doubt is resolved in favor of the memory of the witness.

It is said of the King of Siam that he believed everything the Dutch traveler told him, until he said that in Europe the water in winter became so solid that men and even elephants could walk upon it. This, his majesty said, was impossible, and at once accused his entertainer of lying.* There can be little doubt that after the interview, the monarch's memory remained good of the fact that he *had* been told of this thing, and he would have remained a good witness to that particular part of the conversation for the rest of his life. If, in addition, he had been, for the first time, brought to view and test the ice of a frozen river in a country where water sometimes freezes in the season of winter, his testimony, at any subsequent period, that the water was frozen on the particular day of his view of the wonder, would be worth that of a hundred residents of its bank who should testify from mere memory, that the river was or was not frozen on that day.

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*Locke on the Human Understanding.

In this case we have hundreds of witnesses whose circumstances and relations are in perfect harmony with the theory that they could have seen and heard the thing alleged if it had occurred; each individual describing either the knowledge of his own senses of a result, or of the hearing of a result, which, if in fact it occurred, or if in fact he heard of it, was the most startling and unheard-of thing in all his experience. To him it was a sharp and vigorous departure from the course of nature; becoming known of men, this thing equally moved and astonished the civilized world.*

Imagine a suit for an infringement against Fulton, and the testimony of a witness that he was on board on the trial trip, and then imagine counsel making the charge against him that he was beguiled by his imagination into honestly thinking that he saw the boat propelled against the current by steam or by unseen forces!

In the then state of knowledge, especially in the community of Eberly's Mills, the transmission of the voice by wire and of the tones of the voice by electrical machinery beyond ordinary hearing distance, was to present such a marvel as to challenge attention in the very nature of things.

It was not merely a wonderful mechanical contrivance like the sewing machine, which accomplished the seemingly improbable combination in mechanics, which could perform rapidly and perfectly a familiar work; but this was an unseen and mysterious cause, whose processes were not discoverable to the vision, whose force seemed rather of the unnatural, and whose *results alone* impressed the mind and memory.

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* "A result of transcendant scientific interest, and the greatest by far of all the marvels of the electric telegraph."—See opinion of court below, p. 25.

No detail of mere machinery or adjustment needs to be remembered. If the machine *talked*, and the witness *heard* it, there can be no doubt of the accuracy the impression made. If the machine talked, we might well dispense with the fallible memory of some unlearned and unskilled witnesses as to the mechanism employed, because we know that the appliances used in the magneto and variable resistance instruments were the invention here in issue, as none others would or can transmit articulate speech by the electric current upon wires.

This brings us to another oft-repeated criticism of several individual witnesses for the defense. If the shrewdest and most able cross-examination could lead a witness to say that he had seen and talked through a certain instrument of the exhibits in evidence, identifying it, when it could be argued that at the exact time of the act the particular instrument identified was not perfected or in use, according to the testimony of Drawbaugh, or some other witness, the learned counsel profess themselves satisfied, and urge the court to agree with them, that the testimony is quite demolished. Their theory as to the fallibility of honest, direct testimony, given by the unskilled and unlearned, as to the existence of the machines here disappears, and in its place we have the proposition that these particular witnesses are wicked falsifiers; and these are ignorant men and women; "Pennsylvania farmers, gullible now, and gullible then."

While we have the testimony of the learned, as well as of the ignorant, yet, even of the latter, we submit that it is the strongest possible corroboration of their statements, and the strongest possible contradiction of the complainants' position (that these many witnesses either falsified wilfully, in concert from corrupt collusion, or from the unconscious effects of consultation or "village tavern gossip"), that they do not agree in their memories of the, to them, novel parts of the instrument; or are at fault or are mistaken as to the identity of the instruments, or of the difference between the carbon or variable-resistance machines and the magneto machines.

They are agreed in memory of the great, conclusive fact, that this machine DID TALK.

Running through this testimony from the population at and about Eberly's Mills, and its frequent visitors, we find repeated and constantly appearing support of the main facts testified to, in perfectly natural and consistent collateral matters.

For instance, we find the unlearned and unskilled remembering well the talking machine, when clothed in the familiar garb of a tin mustard box or common glass tumbler, and forgetting other details; we find others remembering the instrumentswith any peculiarity about them like the spiral magnet better than they can recall other parts, as that particularly struck their attention, and naturally would do so, we find the blacksmith remembering the shape and position of the permanent magnet with which he is familiar, and forgetting all about the electro-magnet, of which he knew nothing; we find many remember the common horse-shoe magnet as used, because they knew before what it was. We find a farmer, like Fetters, recalling all the details for applying electricity about the machines, but cease to wonder at his accuracy when we find that the farmer had at some time before greatly interested himself about practical electrical machinery. We find the more familiar in such matters giving more details; the totally ignorant in such matters giving no details at all. The very diversity of detail, the absence of concurrence in circumstance, in occasion and in time, presents this mass of testimony as impregnable against the complainants' theory, that it is the product of consultation or of pre-arrangement.

Neither their sharpest cross-examination, nor their swarm of agents and detectives employed from among well-known members of the community, as well as from without, have been able to bring out any admission or circumstance tending to show that the witnesses have been impressed by an exchange of views among themselves, by undue influence from interested parties, or that they are in conspiracy in framing their evidence.

Is it possible, that complainants' counsel have not been able to break the " fabrications " of even one ignorant and gullible Pennsylvania farmer, and must use rhetoric, rather than the record, to expose the frauds!

It is not possible, if such a conspiracy existed, and an entire population in it; that, in the course of years, no one of the hundreds of conspirators in every walk of life, has ever been weak or careless, or off his guard, so as to betray the slightest hint of it, even in the conversations with his own co-conspirators; yet if he has, the secret agents of the complainant, among the friends and neighbors of the conspirators, have not found it out. The breaking down of two or three, and no more, of the witnesses called upon the question of dates, strongly aids in the demonstration that the mass are unshaken in their testimony. It is rather further evidence that we have called the population to testify, and that in every community there are one, two or three, covetous of the ephemeral distinction of the witness-stand; of the importance of figuring in a case of so much interest, and willing to gain it by a stretch of conscience.

Care has been taken, however, in summoning witnesses to testify, to call no man whose character or whose word could be successfully impeached by any methods known to the law. And it is remarkable, we submit, that in a case of this magnitude, with every means and resource at their command, the complainant, after years of effort and search in near and in the most remote paths, and in every collateral by-way, now rest the charges of conspiracy and of gullibility against these witnesses, only upon the bare statements of counsel. The lives of all the witnesses are clean, their characters for truth and veracity unassailed, and the evidence of any attempt to influence the memory or the impressions of any man called, cannot be successfully pointed out in this record.

We submit, commencing at p. —, an analysis of the testimony, and call particular attention to the absolute certainty of the dates as fixed by collateral matters in every instance.

II.

COMPLAINANTS' TESTIMONY.

As tending to show that Drawbaugh did not invent and use in his shop the Electric Speaking Telephone, as testified to by the witnesses for the defense, the complainants introduce forty-eight witnesses from Eberly's Mills and from various parts of the United States, who are put upon the stand for the purpose of showing they never saw the machines in his shop, *and never heard them spoken of.*

We shall see that of these but ten stand the test of cross-examination and rebuttal, even as to the point to which they testify; while the ten are disposed of on other grounds. Among these witnesses, the first and most important, and one whose means of knowledge and relations with Drawbaugh are claimed to strengthen complainpnts' theory more than any other witness, is THEOPHILUS WEAVER. (*Complainants' Case, vol. 1, p. 376.*)

He describes himself as a "solicitor of patents, pattern-maker, builder, and experimental machinery manufacturer," and as "counsel in patent cases."

He testifies that he had acted in getting up specifications for Drawbaugh in various minor inventions, and, in a word presents himself as the man to whom Drawbaugh would most likely make known his telephone inventions, if they had existed. He then proceeds to testify, in chief, that he never heard that Drawbaugh had invented a telephone until the first half of 1878, and then it was a mere device to be connected with a clock, "to announce the hours vocally."

It transpired in his cross-examination that he had been employed by the complainants to get up testimony (*Id.* 445, *et seq.*) in the neighborhood, and to influence sentiment in the community (page 480), and had been so employed by an agent of the complainants, who was visiting the vicinity under an assumed name. It also appeared that he was not on good terms with Drawbaugh, for the reason that he, the witness, had grossly betrayed Drawbaugh as a client (*Id.*, p. 404) in a patent litigation, and had also attempted to pirate the invention himself by applying for an "improvement" upon it. (*Id.* 417.) He then endeavored to betray the person to whom he betrayed Drawbaugh. (*Id.* 414.)

The cross-examination shows conclusively that this man has no notion of honor, and no regard for his oath. (*Id.* 435.)

It was a common practice with him to act as counsel or solicitor for mechanics, and others seeking patents on inventions, and then appropriate to himself the knowledge thus obtained in a professional capacity, by patenting "improvements" upon them. The man paints his own character as infamous, and stamps his own testimony as unworthy of the slightest credence; a man of fraudulent methods and of corrupt conscience, we find him the accredited agent of the complainants, and he stands at the threshold of their testimony.

Complainants also called David A. Hauck in the same line of negative testimony. He is the person with whom Drawbaugh had the suit in which Mr. Weaver was counsel, above referred to. It appears clearly, from his cross-examination, that he was adjudged, both by the Examiner of Interferences, and subsequently upon appeal by the Board of Chief Examiners, to have sworn falsely. Both of these tribunals found not only that he had sworn falsely as to the facts in the case, but that he had taken a false oath upon filing his application for a patent; that he was not at all the inventor of the faucet in controversy, but had it from his opponent Drawbaugh. (*I. Comp., p. 823, et seq.*) He testified that, although frequently in Drawbaugh's shop, he had never seen any talking machine and never heard of one.

Without regard to the personal feeling or the character of the witness, especially in view of the fact that he contradicts an exceptional number of men and women testifying as strongly to a memory of a positive and wonderful fact, we urge that this case affords an exceptionally striking illustration of the wisdom of those settled legal rules for valuing evidence, which give great weight to positive, and little weight to negative testimony.

This court has said of this rule, in *Stitt* v. *Huyderkopers*, 17 Wall. 354, 394: "The court charged the jury, "that 'it is a rule of presumptions, that ordinarily a witness "who testifies to an affirmative, is to be preferred to one "who testifies to a negative, because he who testifies to a "negative may have forgotten. It is possible to forget a "thing that did happen; it is not possible to forget a thing "that has never existed.' We are of the opinion that the "charge was a sound exposition of the recognized rule of "evidence of frequent application."

See Collection of Cases, 14 U. S. Dig 642.
See Gilbert on Evidence, 140.
1 Stark on Evidence, sec. 32.

While no person possessing a memory could well forget having talked through one of these machines at the time in question, yet it may be true, that persons called to testify (as they are) that they never heard of it years before, or did not see it, tell the truth, from lack of opportunity to see or hear it. A very few honest and disinterested, may be an exception to the rule, and actually forgotten the conversation or the view.

The differentiation in the ability of persons to recall facts, or impressions from the eye and ear, of things and conversations not in and of themselves remarkable, is a matter of common observation. In respect of this, may be considered the difference between the man of many affairs and the man of few; the man of mental occupation and the man of other pursuits; the man devoted to his own interests and the man interested in the affairs of his neighbors; and, finally, the difference of age and temperament, which would affect the proposition, that all men having merely seen, or heard of a thing likely to make a grea'er or less impression, as men may vary, all men would remember it.

And, too, the average lay mind has never yet comprehended that " don't remember " may not be resorted to in cases of self interest; to avoid enmity, or to please a friend; or that it can amount to perjury or any wrong; upon that answer no prosecution for perjury ever did stand, because of the practical impossibility of proving of the particular witness that his power of memory was equal to that of other men. No physical or psycological research, and no expert could afford the proof, whether he in fact did remember; and witnesses are more easily influenced not to remember.*

The usual question put to these witnesses was substantially as follows: " If Mr. Drawbaugh, for five " or six years before speaking telephones were heard " of elsewhere, had at his shop a talking machine, " by which people at different places could carry " on conversation with each other along a wire, and " had frequently shown it to people, and had had them " carry on conversation over it, so that they knew that it " would do what he claimed for it, and had represented " that it was going to supercede the telegraph, do you " think you would have known of it?" (*II Complainants' Case, pp. 1103, 1115, 1135.*) And so the witnesses are made to swear, not only to the premises and conclusion of the syllogism of counsel, but also to his syntax and rhetoric.

There is one consideration appearing in complainants' own proofs that is at once conclusive against the value of this testimony. With a few exceptions, the entire number of witnesses are *offered* to give testimony tending to show:

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*See evidence of this influence, Harper and Traver, Defts. Surrey, pp. 238, 211; Weaver I Complts., p. 480.

(1) That the telephone never existed in Drawbaugh's shop prior to the Bell patent ; and

(2) That it was not heard of in the community prior to the Bell patent.

With the few exceptions, to which we shall refer, the witnesses testify not only that they did not hear of the machines or know of them from 1867 to 1876, but go further and extend the period to 1878 and 1879 and 1880 ; so that by fixing the dates, the strength of their testimony is no greater to the point that the machines did not exist up to 1876, than that they did not exist in the later years mentioned. If not seeing or hearing of them establishes that they were not there up to 1876, the not seeing or hearing of them by the same witnesses in the same circumstances and conditions, in 1877, 1878 and 1879, would establish that they were not there in the latter years ; but we have from the mouths of the complainants' own witnesses, offered to prove that Drawbaugh's *later* machines could not have been constructed as early as 1876, because he showed the earlier ones, that there can be no question that at the earlier dates of 1876, 1877 and 1878, machines were in the shop in such a condition that they were perfect telephones, though in ruder forms than the later ones.

Complainants' witness, Isaac B. Landis, watchmaker and jeweler (*I Complts. 606*), fixes his visit to Drawbaugh's shop by entries in his book in October, 1876; never saw him before and has never been there since. He says: Q. 23.—" State whether or not Drawbaugh showed you any other machines or devices which he had there, and how he came to show them to you?" A.—" He took us through his workshops and showed us his apparatus for electric bells; also an insulator, and an electric fire alarm and an electric alphabetical apparatus, his lathes and a machine for grinding tighteners for his patent axles, *and an instrument for speaking through, which he called a telephone.*" Q. 28.—" Will you describe, as well as you are able, the telephone which he showed you; state where it was and what Drawbaugh said with relation to it? A.—It was in a room to the left on entering the place by the stairway, nearly opposite the door. *I recollect of it being made of tin; apparently a tin can with a piece of bladder across the end of it, with a magnet attached to it in front of the bladder; and also, he said, in calling our attention to it, that this was to revolutionize the world*, or words to that effect; that it was for the purpose of speaking through; carrying the sound of the voice." He further goes on to describe that the machine had a magnet on it wound with insulated wire.

Rufus E. Shapley (*I Complts. p. 587*), visited the shop of Drawbaugh in October, 1876, in company with Landis. In relating what he saw he says: (*II. 22*): " We saw " several bells which were rung by electricity, an alphabet- " ical telegraph, and an instrument which he called a tele- " phone."

Q. 23—" Where was this instrument he called a tele- " phone; how did he come to show it to you?

A.—" The instrument was lying on a table near a " clock, in the same room."

He then proceeds to give the same description as before quoted from Landis, and states that he understood Drawbaugh to say that " he had it up around the shop." Drawbaugh said that they *had spoken with it, and he identifies Exhibit " B " here in this case as the instrument he saw.*

Complainants' witness, Orlando Kahney (*I Compltს. p.*

1,005), states that he was at Drawbaugh's shop and heard of his working with a talking machine October 3, 1876, and fixes the time by his return from the Centennial. He further shows that he talked through the machine and saw Exhibits "F" and "B" (perfect machines), as early as the winter of 1877–8 (*pp. 997, 998*).

Charles A. Landis (*II Complainants, 1,070*) was told by Shapley, between March 31 and April 13, 1877, that "Dan. had a talking machine, and that he should see it "when he went there." And he did see a machine there "for talking by electricity."

Abram L. Rupp (*II Complainants, 1,144*) testifies to talking through the machine with Drawbaugh in the winter of 1877.

Complainants' witness, Geo. C. Rupp (*I Complainants, 1,126*) testifies to talking through the machine in the shop in the winter of 1877.

The Western Union telegraph operator, Richard B. Ziegler, testifies that Drawbaugh himself brought to his office in Harrisburg, Exhibit "A," in the summer of 1878. (*I Complainants, p. 1,027.*) The witness examined it and remembers it distinctly, and is corroborated by the testimony of Stees and Johnson (*pp. 189, 209, Add. proofs*).

It is conclusively shown on behalf of the defendants that the perfected carbon instrument "J" was taken to the office of Wm. J. Stees, in Harrisburg, May 10, 1878, and left there for trial, and it was then and there operated.

Of these negative witnesses twenty-three stand effectually rebutted by the testimony subsequently offered by the defense, and many of them returned to the stand and corrected their testimony. (See analysis, appendix "C," closing

brief.) These are: Wm. Darr, Jacob Carns, Cyrus Bowman, Abraham Ditlow, Joseph Ditlow, Jacob Evans, Amos Frownfelter, Wm. Frownfelter, Theodore Gissinger, Daniel Hart, Samuel F. Hauck, John Hirsch, Orlando Kahney, Benj. Kauffman, Geo. Kissinger, Geo. W. Mumper, Michael H. Natcher, Wm. Natcher, J. C. Nesbit, E. M. Nichols, Henry S. Rupp, Geo. W. Rowe, Wm. Sadler.

The following appear never to have been in Drawbaugh's shop till after the beginning of 1876, and cannot give any evidence as to what was or was not in the shop prior to that time: M. J. Bailey, Geo. W. Heighes, Keifer, C. A. Landis, I. D. Landis, Rufus E. Shapley, Matthews, H. R. Mosser and Worley. Of the remaining sixteen, we have discussed Theopilus Weaver and David A. Hauck. The dates given by Geo. W. Kissinger, —— Kissinger, J. C. Zimmerman, Elias Kissinger and Geo. F. Kissinger—one family—are contradicted by Wm. Natcher, and are shown to be unreliable in the record, in the hydraulic ram matter. Of the remaining witnesses, Henry and Jacob Niedig, there is no evidence that the former was ever in Drawbaugh's shop, and the latter cannot remember being there after the early part of the year 1876.

Isaac Lloyd, of Harrisburg, was at the shop twice in 1866 and 1867, and again in 1878, and two or three times in the meantime. He did not hear of them up to February, 1878.

Of course we know that the telephones were there at that date, and it is established by the complainants' own testimony. He was never there except on errands, and it is remarkable that there may have been some men there on brief business who were not shown the machines.

John Kahney, quite an old man, is contradicted by his sons, Norman, Ira D. and Augustus.

William Darr (*I Complainants', 358*) testifies that he lived at Eberly's Mills prior to March 31, 1870; that he was around in Drawbaugh's shop during that period; that he never saw any talking machine, and never heard of any. On cross-examination he is made to relate of this period that he had talked with Drawbaugh, who asserted that he would be able to talk across the sea, whereupon Darr replied: "O, "you had better try Yellow Breeches first. What is the "matter with you, Dan; are you crazy?"

As an illustration of the unsafety and utter worthlessness of this negative testimony, J. C. Nesbit (*Complainants', vol. 1, p. 687*) is cited. He was called to prove that Drawbaugh did not mention telephones in 1878. Nesbit was there for the purpose of getting materials for an historical sketch of Milltown. In connection with his testimony the history compiled from the material was introduced, and it was silent as to the telephone, although treating quite fully of Daniel Drawbaugh. Upon the production of a manuscript made by Hull at the very visit Nesbit made, it was shown conclusively that Drawbaugh did mention the telephones, both carbon and magneto, as his invention ("two kinds of telephones"). This manuscript is shown in the cross-examination of Nesbit, and then, on the demand of counsel, the complainants were obliged to put in another copy of the same history, which contained an appendix, with the substance of Hull's manuscript statement about telephones.

This testimony proves something else besides the unreliability of negative testimony.

Nesbit was an intelligent and honest man, telling of a comparatively recent visit, and had it not been for this mannuscript his testimony would have stood to the effect that Drawbaugh did not mention telephones, and that he, Nesbitt, did not hear of them there. It appears with perfect clearness that the agents of the complainants over and over again interviewed persons in Eberly whose memories were positive against their theories, and then failed to call them. (*See Defts. S. Reb., p. 1,117, Ans. 28; Defts. Vol. 2, 1,171; Defts. S. Reb. 333; Defts. S. Reb. p. 375; Defts. S. Reb. p. 155, Id. p. 177, Id. p. 189*).

In this connection, the history of the two Gregorys is interesting. One of the sharpest criticisms made upon the Drawbaugh defense at the first hearing was that those engaged about the shop with Drawbaugh, as workmen, were not called, and that it followed from the defendant's failure to call them, as well as by the testimony of Jacob Carnes, a workman for the complainant, that Drawbaugh's statement and the story of the witnesses for the defense were incredible, because the very workmen about the shop did not know of his telephone.

Before the second hearing in the Overland case (*Add. proofs, pp. 181, 185.*) Emanuel Gregory, a member of the Drawbaugh Manufacturing Company in 1870, and his son, who worked in the shop in 1870, were found living in Massachusetts. They both of them testfied they had not been in the State of Pennsylvania from the 10th day of December, 1870, until the day when they gave their testimony. They further testified that while at work in the shop with Drawbaugh they had many times talked through the telephone with him and aided in his experiments. It appeared further that they had been visited by the agents of the complainants, and had made their statements to them in regard to this matter before the first hearing of the cause.

Of this class of witnesses, that which seemed to the Circuit Court to be most conclusive against the defense, is that of Mr. James P. Matthews, managing editor of the Baltimore American. He has the place of honor in the opinion; as the court observed, "with a memory unusally retentive and active," and as "a careful, conscientious man."

He testifies (*I Complainant, p. 540,*) that he went to the shop of Drawbaugh especially to see the electric clock in April, 1878, and he made some brief notes of what he learned, and subsequently wrote from them an article for his paper, published *November 28, 1878.* His testimony is chiefly to the point that he understood from Drawbaugh, at the interview in April, that, while he had experimented somewhat upon telephones, yet he never expected to transmit articulate speech, and that he saw there "no telephone, and nothing that looked like a telephone." This testimony is of the same class as several newspaper articles of 1878, tending to show that Drawbaugh was merely experimenting. The article in question is a tissue of errors in its conception and description of the clock which it purports to describe, and would of itself stamp that portion of the evidence as without value. The witness subsequently wrote a letter (*Appendix, Add. proofs, p. 776*) to complainants' counsel, called out in the argument below, in which he says: "I ought to have said in my affidavit and "in my subsequent examination, that at the time of the "interview I had probably never seen a working telphone, "and knew little or nothing about its mode of operation. "The impressions in the newspaper paragraph referred to "may have been modified, colored or changed by conversa-"tions with other people on the subject after the interview "and before the article was written." He further states in his letter, that "the two wooden hemispheres," which he testified that Drawbaugh showed as parts of the telephone, and had then in his hands, he was mistaken about, and he can not say whether Drawbaugh touched them or said anything about them. Further: "My recollection of the whole transaction is so vague "that I never ought to have ventured to say anything "about it, and the portions of my testimony relating to this "matter, certainly ought not to be considered by the court "in making up its decision." He had testified that his impression was that Drawbaugh had entirely thrown aside telephone experiments; but he is contradicted in this by the defendants' own witnesses, Shapley, D. A. Landis, C. A. Landis, Orlando Kanney, A. L. Rupp, Geo. C. Rupp, Henry R. Mosser and Theodore Grisinger. If this were not enough as to the testimony of this witness, held by the court below to be of sufficient importance to figure as a chief factor in the destruction of the defense, we now quote from the defendants' own brief in the court below, bearing in mind that Matthews' testimony is material and competent only as showing there was no telephone at Drawbaugh's shop in April, 1878, and that all there ever was of it was futile experiment, as follows (Brief below, page 20):

"Our belief is that the *tumbler instrument was first made as an electric speaking telephone in 1877-8;*" they could say no less, as their theory had been, and their witnesses had sustained it, that the electric telephone was there not only in the winter of 1877-8, but also in October, 1876.

It is evident that the complainants were not seeking the truth so much as witnesses to sustain their theory, and that even for this purpose negative testimony is obtained-not as representing the knowledge of the community upon the subjects testified about, but, after being carefully culled and selected, because it was thought, from the lapse of memory, from susceptibility to influence,* or from other cause, the witnesses would be able to say, at least, that they had not seen the telephone, in such language as might be put into their mouths under the manipulation of shrewd examiners. The whole of it should be laid out of consideration.

The testimony of Kieffer and Wilson, persons to whom Drawbaugh had shown other inventions, and to whom he talked about his electrical business, standing by itself, has force; nevertheless, they are negative witnesses, and they cannot stand against the positive testimony of men who saw and talked through the telephone, remember the words, and identify the instruments.

Still, it is conceded that such negative testimony of Kieffer's and Wilson's and Lloyd's, unexplained and unanswered, would have greater value than that of ordinary negative testimony, and the Circuit judge has given it almost controlling weight, because they were men with whom Drawbaugh had conversations about other inventions and electrical experiments, and because he did not speak of the telephone to them, and to whom it is assumed he would open his heart freely on the subject. As stated in the opinion in this connection, naming these witnesses with Weaver and Hauck (*supra*):† "The proofs show that during the years from 1868 to 1878 "he did not attempt to avail himself of opportunities for "demonstrating his invention and bringing it to the notice

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*See Weaver's cross-examination and letters, I. Complainants, p. 480.

† We have seen that Weaver at least should not be considered worthy of mention, and that Hauck is little better.

" of his friends, who were peculiarly qualified to appreciate " it and were favorably circumstanced to assist him."

Without referring to the possible effect of influence upon the memories of these witnesses and complainants' influences upon all,* we propose to show right here the radical error of this proposition, and to show by positive testimony that it has no material basis to rest upon.*

Mr. Kieffer, Mr. Wilson and Mr. Lloyd resided at Harrisburg, and were men of character, without doubt. David A. Hauck resided at Mechanicsburg, and did not know Drawbaugh until he went to Eberly's Mills in the spring of 1873, for the Hauck Manufacturing Company. He is the witness heretofore discussed as having a litigation with Drawbaugh.

We reply as follows:

1. By the testimony of men of equal or of higher standing than these who figure in the opinion, who were more intimate and more likely to be applied to by Drawbaugh, that he did repeatedly apply to them and explain his invention to them, and:

2. As one reason why he did not speak of the telephone to the witnesses named in the opinion, or apply to them for help, that he was laughed at, derided and denounced as crazy by those men who knew him best, and were of as high character as those to whom he did not apply.

I.

Hon. Richard D. Haldeman *(Add. proofs, p. 102)*, the member of Congress from that district from March 4, 1869, to March 4, 1873, testified that during his first cannot as representing the knowledge of the community upon the subjects testified about, but, after being carefully culled and selected, because it was thought, from the lapse of memory, from susceptibility to influence,* or from other cause, the witnesses would be able to say, at least, that they had not seen the telephone, in such language as might be put into their mouths under the manipulation of shrewd examiners. The whole of it should be laid out of consideration.

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I.

Hon. Richard D. Haldeman *(Add. proofs, p. 102)*, the member of Congress from that district from March 4, 1869, to March 4, 1873, testified that during his first canvass for Congress, he visited Drawbaugh's shop, and Drawbaugh exhibited to him and explained to him the talking invention. He remembers the wrapped wires distinctly. He relates (*p. 103*): "I was so much impressed that invariably, when elected to Congress, I sent to Daniel Drawbaugh the mechanical reports, believing him to be a mechanical genius. He is corroborated by his wife, a daughter of Ex-secretary Simon Cameron, who learned from her husband in that canvass of 1870, the year she was married, of the wonderful machine at Drawbaugh's shop, which carried the voice from one place to another by electricity, and that when the first "telephone" was publicly talked of, it was spoken of by husband and wife as recalling the knowledge of Drawbaugh's invention, as Drawbaugh's patent.

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*See letters of Complainants' agents, Complainants' I. 480; and see Defendants Sur. rej. 238.

Dr. Bowman (*Add. proofs, pp. 172, 177*) remembers the date of visiting Milltown, during the baptism of Mrs. Wm. R. Gorgas, and when his child, born Nov. 10, 1867, was between two and three years of age, and as prior to the death of Mrs. Bowman's mother, March 14, 1871, thus fixing the date. He testifies to talking between the basement and the third floor with Drawbaugh's telephone, and gives a portion of the words. He is corroborated by his wife. (*Id., p. 177.*)

George W. Hunter (*Add. proofs, p. 172*), proprietor of the Lochiel Hotel, at Harrisburg, since the year 1868, was applied to by Dr. Moffit to advance money and take hold of the Drawbaugh telephone, prior to the centennial. (See Moffit, *infra.*)

John M. Woodburn (*Add. proofs, p. 133*), when candidate for the office of County Treasurer of Cumberland County, in 1873, against Lavan H. Orris, who was nominated and elected, testifies to his visit to Eberly's Mills in August, 1873, that he was shown the telephone by Drawbaugh, who explained it to him, and the use of the wires and the manner of conducting the electric current, and was told that it would talk for miles, and that he desired means to aid him to patent it and introduce it.

He is corroborated in every particular by Mr. Geo. Emrick (*Add. proofs, p. 130*), who was with him.

Mr. Orris (*Add. proofs, p. 121*), the successful candidate for county treasurer that year, 1873, during the canvass visited Drawbaugh's shop, and had substantially the same interview as was had with the others just referred to.

Jacob Barber, who had been commissioner, supervisor and school director, (*Defts. S. p. 371*), and candidate for the office of county commissioner that year, testifies as of the same date and substantially the same things.

The same of Longnecker (*Add. proofs, p. 155*); Abram Marquart, one of the most prominent citizens of Newville, as of March, 1875, with the date fixed absolutely by a business transaction which took him there, and by his books.

Wilson H. Strickler (Add. proofs, p. 233), stock raiser, fixes the date as prior to the 15th day of August, 1874, conclusively, as that was the first, last and only time he was ever in Drawbaugh's shop in his life, or ever in the village of Milltown in his life. He talked through the telephone, describes the sound as coming from the wires through the instrument in which he listened, identifies Exhibit "C" positively as the one used, and the use of electricity was fully explained to him by Drawbaugh.

This witness at the time was engaged in making an invention of his own, viz., a method of insulating telegraph wires by means of mica, combined with other materials, for which invention he filed application for a patent August 15, 1874. He visited Drawbaugh's shop prior to the filing of his application, and while he was engaged in maturing his invention, and prior to obtaining it, because he wanted to see whether there was anything in the construction of the machine providing for the insulation of the wire by means of thread or silk, that he could advantageously employ in his own invention for insulation by means of mica.

Christian Eberly, who formerly owned the most of the village of Eberly's Mills, one of the most prominent and respected men in the community, a former partner of Gov. Geary, and who knew Drawbaugh intimately, testified (*D. vol. 1, p. 121*), that Drawbaugh applied to him prior to January 1, 1871, to go into partnership with him on the telephone; Eberly to furnish the money for a half interest in the invention, and that witness did not accept the proposal.

Henry Snyder, grain and commission merchant, testifies (*Id., p. 513*) that in 1872 and 1873 he was repeatedly applied to, on behalf of Drawbaugh, by his brother, to aid him in taking hold of the talking machine.

Henry Baylor, retired lumber merchant, of York, Pa. (*Id., p. 150*), testifies that as early as June, 1873, Drawbaugh showed him the inventions, and that he, witness, said to him then: "Why, Dan, this is virtually a talking telegraph," and that Drawbaugh asked him to take hold of the matter for a one-half interest.

Dr. J. W. Moffit, of Harrisburg (*D. I., p. 494*), testified that prior to the Centennial year he was applied to by Drawbaugh, either to go in with him to get out a patent; or if he, Moffatt, had not the means, to get some one else to do it. (See Hunter, *supra*.)

Capt. J. A. Moore, a member of the Axle Co. with Drawbaugh, Principal of the Whitehall Soldiers' Orphans' School, former member of the firm of M. N. Grove & Co. (I. D., p. 614), fixes the date positively in May, 1875, that Drawbaugh applied to him for assistance and explained the telephone to him, and he identifies Exhibit "B" as the machine then shown to him.

Wilson Bear, (D. I., p. 635), a member of the same company, has some recollection of having been offered an interest in the invention, and of Drawbaugh asking for assistance in the matter in 1875.

It appears from Christian Eberly's testimony (D. I., p. 113), that Drawbaugh, in 1871 and 1872, tried to induce Mr. Lee, Private Secretary to Gov. Geary, to take an interest in the telephone.

Jacob E. Shettel (D. I., page 206), who identifies and describes Exhibits "B" and "L" minutely, with the details of the electro-magnet and the wires, was a former member of the Electric Clock firm, and in 1872, 1873 and 1875 saw the telephone, and was urged by Drawbaugh to assist.

Harmon K. Drawbaugh (D. I., p. 550) testifies, that as far back as 1872, Daniel Drawbaugh urged witness to try and find persons to go in with him.

Elias Greybill (S. Reb., p. 184), former member of the firm of Zachrias & Co., testifies that before the firm of Zachrias & Co. gave up their warehouse at Whitehall Station in September, 1875, Drawbaugh applied tohim for money to assist in getting the telephone introduced.

William R. Gorgas, of Harrisburg, Pennsylvania,

(D. S. Reb. 1,128) gives corroboration of this testimony, but cannot remember which invention it was for which Drawbaugh wanted assistance.

Thomas Draper, of Dover, Delaware (Defts. Sur. Reb. 1,123) manufacturer, and owner of a line of vessels running from Philadelphia to Dover, testified that in 1874 he saw the talking machines, and was asked to aid in getting patented and introduced.

He is corroborated by his wife's testimony, Mrs. Annie E. Draper (*Defts. S. Rej., p. 208*).

Jesse Eickholtz (*D. S. Reb. 154, ans. 17 and 18*), testifies that Drawbaugh wanted him to go into it in November, 1873; and when he declined, he asked him to urge his friend, George B. Eyster (the sheriff of the county, to go in).

Eyster (*Id. p. 890*) corroborates this statement.

Orlando Kahney, (*D. S. Reb. p. 35, 45*) testifies, that October, 1875, Drawbaugh tried to borrow money of him to patent a telephone invention.

Mr. Herr, of Harrisburg (*II Defts., p. 667*) testifies, that early in 1871, Drawbaugh applied to him for help, and then asked him to try and procure some person to assist him, and he would give him a half interest in his talking machine.

Henry F. Drawbaugh, his brother, a man of influence and standing, testifies that Daniel repeatedly urged him to furnish the means, and, failing in this, tried to borrow the money from him for the purpose. (*D. I. p. 396*).

2.

As to his reasons for not calling on every one, D. Balsley (*Vol. 1, p. 192, Ans. 16*) testifies that prior to 1874 Drawbaugh talked with him about it, and stated that he had asked his best friends, and they had all refused him, and that if he had the means he could put it through very quick. (*Ans. 27.*) He said the same thing to others, notably to W. H. Bates in 1874 (*D. Vol. 1, p. 419, Ans. 15 and 16, Cross-ans. 23, 24 and 42*): "He had asked "several men to assist him, and they had just laughed at "him. Several times that I was there his mind seemed to "be taken up with it. He said he would like to get up a "patent, but he hadn't the means to do it. He said he "could make a fortune out of it."

He told Waggoner, in Nov., 1874 (*D. I. 122; Ans. 5, 21, 9, 27, 29 and 24*), that the machine was perfect, and that it would be the first talking machine patent in the world, showing him instrument Exhibit "A." Drawbaugh himself testifies (*D. Vol. I, p. 831; Ans. 4, 21, 22 and 23*) that people ridiculed him, told him he was crazy, and it was so talked at the village store.

The witnesses, Fettrow and Waggoner, Yetter, Glory, Zimmerman, Henry P. Drawbaugh, Bates, Rupp, Byers, Bricker, Mosser, John S. Drawbaugh (all in D. vol. 1); Lenig, Updegraff (D. vol 2); Zearing, Mrs. Brown, Sprenkel, Hosler, Graham, Murphy, Woods, Landis, W. W. Snyder, running through three years (all in S. Reb.), testify that Drawbaugh was ridiculed, called a fool, crazy, and a crank, because of his claiming this invention, and that it would never come into use.

Captain Moore testified (*D. I., vol. –, p. 614, ans. 36; H. F. Drawbaugh, 396, ans. 49 and 50*), that Drawbaugh was an extremely sensitive and diffident man.

We suggest that it would be presumable on such testimony, aside from other reasons going to rebut this testimony, that the three or four witnesses testifying that Drawbaugh did *not* speak to them were omitted by him because of discouragement or diffidence or experience of repeated rebuff, rather than that the positive testimony of himself, and of so many witnesses of character, is wickedly false.

Even Drawbaugh and his witnesses should now and then have the benefit of the old fashioned, and still not obsolete, presumption, in favor of truth and honesty.

It was said by the learned Circuit Judge, that it was incredible that the statement of the witnesses could be true—that they could remember the words they heard through the telephone.

We respectfully submit, that the criticism would be an apt, as it is a usual one, if made of ordinary conversations, when the witness, after a long period of time, attempts to give the exact words; but, when a man is relating an exceptional experience—an astonishing result, a mystery connected with spoken words—it would be more incredible if he did not remember it.

Decrees and judgments cannot be based upon such reasoning, or against such testimony as we present, and they have not been. To reach such a result in this case resort has been had, not to the testimony, but to the somewhat vague and ill-defined theory of the inherent incredibility of the defense, and especially of the story of Daniel Drawbaugh himself.

We defer a discussion of the overwhelming evidence adduced and remaining uncontradicted in support of the priority of Drawbaugh's conception and invention, to consider somewhat the story of Drawbaugh as given in evidence, and Drawbaugh himself.

III.

GENERAL CONSIDERATION OF DRAWBAUGH AS AN INVENTOR, AND THE ERRORS OF THE CIRCUIT JUDGE IN RESPECT OF HIS MENTAL EQUIPMENT AND STORY.

At the outset, in considering Drawbaugh as a witness, there can be no question but that his history of himself and of his experiments and labors upon the electric-speaking telephone from 1860 to 1879, inclusive, must be either a truthful statement, or one manufactured, in general and in detail, by a wicked mind; a mass of irredeemable perjury from beginning to end; and yet, none of the legitimate methods known to the profession but have been applied in this case, and no resource has failed to bring these methods to bear for the purpose of breaking down that testimony.

Upon the course and path of his life, and his relations and dealings with all men from his boyhood down to his fifty-eighth year, the complainants have focused a light which has made luminous every detail.

Presumably, if his testimony could have been impeached, either by attacking his character, or contradicting his statements by the direct testimony of others, it would have been resorted to. But we find that notwithstanding his difficulties, lawsuits and his controversies with men, by the testimony in behalf of the complainants, as well as of the defendants, that he bore a character, and had a life record, whose honesty and truthfulness could not be assailed. All bear testimony to his steadiness, his industry, his enthusiasm in physics, and especially in electric science. The worst that any man ever said of him was that he was crazy on the subject of the talking machine. Edward Nichols (Complainant's testimony, vol. 2, p. 860) testifies as follows:

Q. 77.—"Do you regard Daniel Drawbaugh as a very fine man; conscientious and truthful? A.—I do."

Isaac Lloyd, another of their witnesses, after testifying that he had known Drawbaugh, says (*Vol. 2, p. 273*), that from his knowledge he was an upright, conscientious, truthful man, and so testified Zacharias (*Defendants' Vol. I, p. 50; Smyser, Id., 78–9; Yetter, Id., p. 173; Condry, Id., p. 142; Paisley, Id., p. 195; J. C. Smith, Id., 342; D. H. Good, Id., p. 507*). He lived in one community all his life, and was known of all men in it. We must take it then, for granted, that there was no evil in his mind or life, so far as human ingenuity was able to find it, in the places and among the men who lived with and beside him during the whole course of it.

The record is full of evidence of the employment of "agents" from the community by the complainants in a search for matter wherewith to attack him. So that on the theory of the complainants and the theory of this decree, the wickedness and devilish cunning by which he sought to impose a fraud upon the public and to work out a great robbery must have been conceived after the publication of Bell's invention in 1876; and to further the scheme, that this witness fabricated a history in every detail and incident bearing on the controversy, covering a period of twenty years and over. He must have made and partially made telephones, having the necessary and harmonious appearance of age, of the most ingenious description, and prepared his story in that regard to stand the most scientific cross-examination in every detail, aided by trained experts.

While it may be true that a man may become suddenly vile, and change and radically contradict the evidence of the course of his life, and while there may be one or two or three illustrations of such monstrosities in the history of human nature, yet it has never been true in the history of jurisprudence that a fabricated story, lying in its general plan and lying in its detail covering a long period and a series of transactions, could stand the tests applied to it in the courts of justice.

Drawbaugh's testimony covers 332 pages of closely printed matter in this record, of which 180 pages are cross-examination, and we think it may be said that the complainants commanded every available resource and all the ability and knowledge, both scientific, legal and common, in this work that could by any possibility be put into an attempt to break a witness by cross-examination.

A careful reading of this testimony, it seems to us, is convincing in itself and by itself of the truth of the story. The very faults of his memory, the immaterial contradictions and changing of immaterial dates only go to strengthen the conviction that the history as related is genuine and truthful. It is without a trace of the inflexibility which characterizes fabrication. The man that speaks is in harmony with the history of the man's character as related; in harmony, with all knowledge of the honest, ingenuous, open-minded genius, as portrayed by the account of his life.

He will not corroborate Eberly, a preceding witness, as to a conversation in 1861-4 which was greatly in his favor, for the reason that he "cannot remember it." (*II Deft., p. 753.*)

He will not corroborate Lowry's testimony that he was shown the cup instrument by Drawbaugh at an early time. He says: "I have been trying to recall it, but I cannot." (*Id. p. 754.*)

If he were cunning and corrupt, he certainly could, when examined in 1881, have been able to describe a rude receiving instrument, as he had described a rude transmitting one. Yet he says he cannot remember the first experiment in receivers, because there were so many different attempts and trials, (*II Defts. p. 760,*) and so the instances of fairness occur throughout his testimony.

Not a Learned Man.

It is said by the complainants that Drawbaugh was not a learned man, and among the arguments to support their theory of inherent incredibility, they say in effect that in the nature of things, no one but a scientist from the curriculum of the schools could have invented the telephone; that it was beyond his mental grasp; and it is said to sustain this proposition, that his inventions were of barrel machinery, jig-saws, nail-plate feeders, measuring faucets, and sundry electrical contrivances, or, as suggested by counsel, " Mere mechanical contrivances and improvements"; and the fact of his busying himself with other inventions in mechanical contrivances is further used in support of the theory of inherent incredibility, as showing that he could not have conceived or had his mind upon so great a discovery as that of the transmission of articulate speech.

So far as the learning is concerned, we believe it can be shown that successful inventors are not the product of the universities, but of natural conditions and of tendencies common enough in American civilization. The tendency here is to learn and advance by experience. American genius cannot be said to be produced, though greatly aided, by school training and discipline. Genius is innate, and the man possessing it, who even, without books learns of a natural principle or agent, like electricity, by handling it and testing its properties, is the man who must advance in its use. No art and no words can portray upon the human mind the impression of a landscape that the actual view will give. No mere theory, though learned in all its technical formulæ, can give the accurate and ready knowledge which practice imparts.

Von Humboldt in his Personal Narrative of Travels in South America, (1799–1804,)* says: "We found at Calabozo, in the midst of the Llanos, an electrical machine with large plates, electrophori, batteries, electrometers; an apparatus nearly as complete as our first scientific men in Europe possess. All these articles had not been purchased in the United States; they were the work of a man who had never seen any instrument, who had no person to consult, and who was acquainted with the phenomena of electricity only by reading the treatise of De Lafond and Franklin's Memoirs. Senor Carlos del Pozo, the name of this enlightened and ingenious man, had begun to make cylindrical electrical machines by employing large glass jars, after having cut off the necks. It was only within a few years he had been able to procure, by way of Philadelphia, two plates, to construct a plate machine, and to obtain more considerable effects. * * * * I had brought with me electrometers, mounted with straw, pith-balls, and gold-leaf; also a small, Leyden jar, which could be charged by friction, according to the method of Ingenhousz, and which served for my physiological experiments. Senor del Pozo could not contain his joy on seeing, for the first time, instruments, which he had not made, yet which appeared to be copied from his own."

The Royal Society of London once elected to honorary membership a man who first demonstrated that lightning and electricity were one. It was the same man whose reports as to his experiments with a kite and a key, it had formerly refused to receive and had made sport of. He stands in history and science as eminent, and is set down as among the most eminent of natural philosophers. He was a "Yankee tallow chandler's son, a printer runaway boy," for whom the schools did nothing.

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*Vol. 2, Bohn's Ed. p. 111.

Michael Faraday was the son of a blacksmith, and a bookbinder's apprentice. After attending four lectures of Sir Humphrey Davy, he gave his attention to practical experiments with electricity. J. Clark Maxwell, Professor of Physics, Cambridge, says, of Faraday's "Experimental Researches" resulting in the discovery of the induction current: "It was at once made the subject of investigation "by the whole scientific world, but some of the most experienced physicists were unable to avoid mistakes in "stating in what they conceived the more scientific language than Faraday's, the phenomena before them."*

Maxwell on Electricity is largely devoted to reconciling the practical methods of Faraday with the theories of the professors.

Hugh Miller's great conceptions took form when, without education, he was working as a laborer at the Cromarty stone yards.

Ampere worked out difficult mathematical problems with sticks and stones before he had learned the names or forms of figures.

But, says the court below, "Drawbaugh was not only "untutored, but he was isolated by his associations and occupation from contact with men of advanced science," and on such reasoning it is found that he must be a swindler, because he dares to pretend that he invented the telephone!

*Enc. Brit., Faraday, by Maxwell.

But it is said Drawbaugh busied himself with mechanical contrivances of comparative insignificance.

In 1793, Robert Fulton conceived the idea of propelling vessels by steam, and we find, by a reference to his life (C. D. Colden, 1817): "His time was also much engrossed by devising a method of superceding the locks of canals by a plane of double incline, on which he obtained a patent in 1794. In the same year we find him obtaining patents for flax spinning and rope-twisting machines 'and various other mechanical inventions,' bearing upon the construction of canals. In 1797 he went to Paris and resided there seven years, during which time he projected the first panorama ever exhibited, and made important experiments in submarine explosives. It was not until 1806 that he made his successful experiment in propelling vessels with steam in America, and not until 1809 that he took out his first patent.

Guttenberg, pending the tardy recognition of his discovery of the art of printing, was engaged upon inventions for new methods of polishing stones, and manufactured looking-glasses. Franklin found time to acquire something of income from the printing press invention, from improvements in stoves, "Poor Richard's" Almanac, and various other contrivances.

Again, the attack is made upon the credibility of this story, upon the ground that such an invention would have been widely known, and would have commanded all the resources necessary to present it to the public. The great success of Bell after the exposition of 1876 is cited as an illustration. We suggest the marked contrast between the presentation of Bell's alleged invention, under the sanction of international commissioners, framed in the authority of the World's Exhibition at Philadelphia, and the invention of Drawbaugh, in the lowly village shop of Milltown, in a by-way not merely of the world, but a by-way of the State of Pennsylvania, and a by-way of the county of Cumberland. We submit that the complainants can take nothing of benefit from the fact that such men as lived in that community, and such men as passed that way, should not care to invest in any telephone, which seemed a mystery and a novelty, but of no practical utility to the learned and the rich of the great cities long after Bell's patents were issued.

Morse conceived the idea of the electric telegraph on the packet ship "Sully," in 1832, and on that voyage made his rough draughts of the apparatus. For twelve years thereafter he struggled with poverty to perfect his invention, and to secure any consideration for it. During this struggle he denied himself the common necessaries of life. Not until 1836 was he able to exhibit it to his friends. In 1843 he got it sufficiently before the public to secure an appropriation, and it was used for the first time on the 24th of May, 1844.*

Elias Howe for years suffered the pangs of poverty and failure to get friends or capital interested in the sewing machine in this country or in England. He never advanced to fame and fortune until his controversy commenced with Singer.

"And yet," says the learned court, following the theory of counsel, "such an invention is of a kind well "calculated to excite public interest and to impress "practical men with a quick appreciation of its com- "mercial importance and its pecuniary value, * * * "and its efficiency and importance as a factor in human "intercourse could have been demonstrated to the public

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* Rev. Iraenus Prime's Life of Morse.

"without appreciable inconvenience or expense. Draw-
"baugh fully appreciated its importance and value. He had
"the means to patent it himself, and friends to assist him
"in introducing it into public use. He had the talent to
"induce others to invest in his invention."

No better answer can be found than in Bell's own case.

See New York *Tribune* article, Nov. 9, 1876; C. Vol. I, p. 250.

The Scientific American, Oct. 6, 1877; C. Vol. I, p. 273.

Testimony of Hubbard, Bell's financial backer, C. Vol. II, pp. 1,613-1,662; and

Complainants' Exhibits, p. 959.

Mr. Wm. Orton, President of the Western Union Telegraph Company, could not be interested until the fall of 1878, although it was presented to him in April, 1877 (*C. Vol. II, pp. 1,285, 1,287, 1,428*), and Mr. Bell himself feared ridicule. (*Complainants' Exhibit, p. 986.*)

Exceptional Treatment of the Defense.

Now, what is there in this case that so distinguishes it in the domain of judicial investigation as to require a reversal of settled rules of evidence?

Direct and positive affirmative evidence, unimpeached and uncontradicted, seems to have failed of legal virtue when applied to this particular controversy; and the rule as to presumptions is so radically altered that the testimony of four doubtful witnesses, that they did not hear of a fact—no, that they did not remember hearing of it*—shall be received as finally closing the door against the possibility of its existence, and against the recognition of all direct and positive testimony of twenty-seven equally credible men and women, that they actually did see and hear of the thing.

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*Kieffer, Complts. 2, p. 1,280.

Yet, we are told that if " he " (Drawbaugh) had a practical telephone to exhibit, he would have selected just such men " as Kieffer and Wilson and Lloyd (who was 'taken " good care of'†) and Hauck (who was Drawbaugh's enemy " and of doubtful veracity), to demonstrate it to them and " to enlist them to demonstrate its utility and value to the " public." And although he did apply to twenty-seven others, it is conclusively assumed that he did not have a telephone, because he did not apply to these four gentlemen. As well might it have been assumed that Howe did not invent the sewing-machine, because it appeared after repeated attempts among his nearest friends, after suffering contumely and reproach in these efforts, it was found that his heart and courage so failed him that he ceased his applications and departed for England without risking further coldness and refusal.

But it seems this case is not only *sui generis* in jurisprudence, but the ordinary experience and history of human nature, of men's motives, of men's probity and and intelligence, can teach us nothing by which to judge of Daniel Drawbaugh " and the cloud of witnesses who corroborate him." Although the biographies of science are full of instances of great discoveries by men of little or no scholastic discipline and who have had no contact with scientific men, yet as Drawbaugh was not a college professor, but a common citizen of Milltown, where he seldom met learned physicists, he could not by any possibility have invented the telephone.

Although the greatest inventors and discoverers, from the earliest to the latest, have either died in povery or succeeded only after long failure to obtain recognition of their discoveries, and year after year have suffered every discouragement and the greatest distress; although this has been a common experience even at the most learned and wealthy and enterprising of the world centres; yet, because Drawbaugh, in the little village of Milltown, could not at once command recognition and influence and capital for the new machine whose uses were unknown, "this story must be a fabrication from beginning to end."*

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†Complts. I. 480.

And because a community corroborate him, it must be a population of knaves or fools. Even the fact that his fertile mind has produced many other inventions of less note and importance, this very evidence of a mind active in the direction of invention is turned into testimony that greater discoveries are beyond his scope.

The logical conclusion of all this reasoning must be, and by the opinion of the learned court is, that Drawbaugh himself is the malign necessity that demands a new and a special law of evidence and a reversal of all the commonly received notions of human nature to fit this case.

If his story be false, he has built a collosal structure of fiction. The lies in it are as bricks in a great building for number, and a flaw in one would bring destruction to the whole.

As the complainant's whole theory and the decision of the court below rests upon the basis that Drawbaugh is a fraud, and has had the ingenuity to set up the story and the influence to get it so overwhelmingly corroborated, we submit from the record a brief sketch of—

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* See opinion of court.

IV.

DANIEL DRAWBAUGH, THE WITNESS, IN THE LIGHT OF HIS HISTORY, SURROUNDINGS AND TESTIMONY.

If a charlatan,* unlike his kind, he has not lead an itinerant life. All that can be told of him from boyhood to age, all the evil or good that is known of him, all the evidences of character that a man leaves in the places that have known him; all the impressions which the course and methods of life of men place upon their environment, exist and are written of Drawbaugh in one place and upon one community.

The story from his earliest to his latest years is a very simple and homely one. If it be true that he developed into a Machaivelli in his fifty-third year, the incongruity is worth consideration from the moral philosophers.

Born in 1827, he has passed his life in the small village of Eberly's Mills, or Milltown, in Cumberland County, Pennsylvania. It is three miles from Harrisburg, and the centre of a farming community. He attended the common schools part of five winters, and in his early years was a reader of the Scientific American, when he could afford to pay his subscription; his scientific library consisted of Comstock's Philosophy, Parker's Philosophy, Youman's Chemistry, and two volumes of Tomlinson's Cyclopedia of Useful Arts, together with a publication on the International Exhibition of 1851.

Before the spring of 1860 he attended a course of lectures on physics by Prof. S. B. Heighes, now Principal of the State Normal School, and for seven years professor of physical science at the York Collegiate Institute. During his attendance upon these lectures, we have it from

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*See opinion of Circuit Judge.

Prof. Heighes that Drawbaugh was giving attention to electric science, and the professor remembers distinctly that even at that early time he had conceived, and talked of, "*speaking through a telegraphic wire by electricity.*" (*Q. 12, Dfts. S. Reb. 96.*) The same witness remembers distinctly, and fixes the date positively between 1871 and 1874, that Drawbaugh showed him Exhibit "C," and told him that the voice produced "*pulsations*" upon the machine. (*Id. p. 100; Q. 37, 38*). It is undisputed that at that early time he was experimenting with electricity. Complainant's witness, G. W. Heighes (*C. Vol. 2, p. 1095*), says: "He was an enthusiast on the subject of physics at that early time." He was familiar with the Everett accoustic telegraph and with the Leon-Scott phonautograph from about 1863. (*D. Vol. 2, p. 1067.*) "The subject of electricity seemed to be his hobby." (*Dr. Undergraff, Id., p. 1089.*)

He was a person of remarkable ingenuity and skill. At the age of thirteen he made a rifle for Daniel Balsey. (Balsey, I. Dfts., p. 195), and at a later period was remarkably skillful in wood-working. At the age of twelve he made a part of a clock. At the age of sixteen he manufactured a small steam engine, an automatic machine for sawing wood-felloes; the last being his own invention. (D. vol. 2, p. 855.) In 1857, 1859, he constructed and operated a photographic apparatus, making even the lenses himself. (Id., p. 900.) He made for his own use a solar transit and a machine for wrapping electric wires. (Id., p. 957, 971, 1,029.) He made his own galvanometers. Of his skill as a workman, complainants' own witness and his enemies have nothing but praise. Very few men would venture to offer advice to him. (Comp. I., Weaver, p. 380); and he was applied to by others to invent, and did invent machines for them. (Weaver, Id. p. 377.) The tack machine for Patton, the paper-bag machine for Sengsier, and a great many other machines for the pump company and for the axle company. A number of his inventions are enumerated in Dfts. vol. 2, pp. 895, 1,061, 1,062.

"He was a great mechanical genius." (Complts. vol. 2, p. 1,550); and "a great inventor." (Id. vol. 1, p. 864.) All the witnesses concur as to his sobriety, his truthfulness, and his incessant and tireless industry, and of his labors, extending far into the night.

He was careless of his own interests and generous and kindly in his nature. His children were sickly and died, and his wife made constant opposition to his schemes, as tending to take his attention from providing his family with the necessities of life.

The story of Mrs. Drawbaugh (*Add. proofs, p. 221*) presents a picture of the man as he appeared in domestic life, so naturally drawn by this plain woman, that it carries conviction of its truth in every particular. He was negligent in money matters, and when he had money "he would give away the last cent." She refused to sign the deed when Drawbaugh wished to sell their little home, to put money into the Talking Machine. (*Id. p. 225.*) There is a vast amount of testimony as to his poverty, in addition to Mrs. Drawbaugh's, abounding in illustrations, to which we only briefly refer.

HIS POVERTY.

He was manufacturing his patented stave machinery, at the outbreak of the war, and his machines, sold at the South, remained unpaid for, and left him with his liabilities at the North. He was thereby bankrupted. (*D. vol. 2, p. 843.*)

The testimony of the witnesses as to his financial condition from that time until 1876 is here barely referred to. Daniel Drawbaugh (*II, 843, 844*), John B. Drawbaugh (*D. Vol. I, pp. 594, 595*). For half of his faucet invention in 1866-7 he received a note for $1,000, which he had discounted; the maker failed to pay, and it passed into judgment and became a lien upon his property. *(*D. Vol. 2, pp. 866, 867, 868.*) His father and mother were helpless and poor, and when he received the money from this discount, he, with his brother Henry and brother-in-law, united in buying a home for them, applying all the money. Nothing of this property so purchased for the old gentleman ever came back to Drawbaugh, and when his father died Daniel was unable to assist in paying his debts.

He became a member of the company with five of his neighbors, and sold his patent right for pumps to them for $6,000. He was to receive for himself $5,000, and a sixth interest in the stock. December 5, 1870, it was decided to suspend operations, and the business was closed out. No dividends were ever declared (*See Gorgas, D. Vol. 1, p. 647; see Vol. 2, pp. 1,147, 1,148; Gorgas, Id. pp. 649, 653.*) Large assessments were made upon its members during the period of its operations. Of the $5,000 Drawbaugh received a portion of it in cash and the balance in notes from the other members, which notes were paid along from time to time, during 1867 and 1868. The assessments upon him amounted to $2,186.33. (*Gorgas, Vol. 1, p. 651.*) He actually paid in cash to the company in assessments $1,210. During the business of the company he was employed as superintendent, but received all told from 1867 to 1871, less than $175 for that work. He purchased the dwelling house and blacksmith shop with the proceeds of the sale of the pump patent, in the fall of 1867, for the price of $2,310, on which he paid $2,000. At about the same time he paid old debts to the amount of about $1,000 out of the same fund (*D. Vol. 2, p. 843; Taylor, D. Vol. 1, pp. 633, 634.*) A lien of $300 was left on the new homestead (*Id. p. 842*). He put repairs on the house, estimated at three or four hundred dollars. He also contributed for his parents, besides the $1,000 above referred to, not less than $400, so that of all he received from 1867 to 1870, a balance was left him of $269.27 for the support of his family in a period of nearly four years, besides what he took in in his little work in the shop and from renting a portion of his house to Daniel Fettrow, for which he received $80 in 1868 and $110 after that. During this period he had no other financial resources (*D. Vol. 2, p. 845*). Instances of his borrowing and of his poverty are related (*D. Vol. 2, pp. 845, 846, 847, 848, 849*). His venture in building hydraulic rams was a failure. (*See Sadler, C. Vol. 1, pp. 1036, 1054*). During the period from 1870 to 1873 he was subjected to extraordinary troubles, both financial and domestic. In November, 1871, two of his children died, and for a long time thereafter he had another child ill and so emaciated by disease as to be a curiosity to the people (*Dr. Bowman, Vol. 1, p. 612; H. F. Drawbaugh, Id. p. 402; Com. Vol. 1, p. 905*). Another child was an invalid (*D. Vol. 1, p. 402; D. Vol. 2, p. 751*). He was too poor to procure medicines (*H. F. Drawbaugh, D. Vol. 1, Ans. 52, p. 402*). He was not able to pay the physician who attended the family and was sued by him February 10, 1873, for a bill of $122.67, (D. Vol. 21, p. 851, and record of judgments in D. Exhibits, 151–2). July 9, 1873, he received

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*See opinion to the points that he was a mere surity.

$425 from the distribution of the proceeds of the sale of the company's property. From this he immediately paid $45 on Dr. Bowman's judgment, and nearly all the balance was paid out on the Neidhammer judgment of $300 and interest, which had been standing for six years. In 1874 the partnership of M. M. Grove & Co., was formed, for the manufacture of axles. It was dissolved in 1876. They employed Daniel Drawbaugh, to some extent, from May, 1875, to March 31, 1876. Paid him in 1875, $310.22; in 1876, $143.84. During this period, from 1869, in April, to this date, he had been desirous of selling his homestead, but his wife refused to sign the deed, except for the purpose of purchasing another. She had always been bitterly opposed to his experimenting and inventing, instead of giving his attention to mechanical labor. (D. Vol. I., H. F. Drawbaugh, 401; H. K. Drawbaugh; Id. 567; Holsinger, Id. 365; Brenneman, D. S. Reb. 106; Mrs. Brown, Id. 164; Springer, D. Vol. I, 186; Chellis, Id. 526; Fettrow, Id. 374–5; Mrs. Drawbaugh, Add. proofs, 221.)

He then conceived the idea, in 1875, of going to Mechanicsburg, five miles distant, to get other employment, and he bargained with his tenant, Daniel Fettrow, to sell him the Milltown property for $2,200, clear of incumbrance. Fettrow had the title examined, found a $1,000 lien upon it, and paid Drawbaugh, on getting the deed, at different times up to April 1, 1876, $1,200. At the same time a house was purchased in Mechanicsburg for $1,740, of which $1,000 was paid in cash April 1, 1876, the balance to be paid in three annual installments, secured by judgment notes. (Fettrow, C. 371; D. Drawbaugh, D. Vol. 2, 854–6.) This left Drawbaugh $200, and he had not a cent of it left after paying it out on his debts. (Id.,

p. 859.) His general financial condition is shown by Renecker's testimony. (D. Vol. 1, p. 236; Hertzler, D. Vol. II, 701; Shettel, D. Vol., Id. 211, 213; George Leonard, D. Vol., Id. 1200.) On March 13, 1877, he bought two pigs from John Rennart at public sale, for $15, and he was obliged to give his note and get his brother John to endorse it for the amount. (D. Vol. 2, p. 836.) On April 1, 1876, the execution on the Good judgment (D. Exhibits, p. 35) was returned *nulla bona* Frees and Yetter testify to illustrations of his poverty (D. Vol. I, pp. 132–35, 135–38.) Village Constable Shank testifies instances of his poverty. (Id., 29, 31.) As do Zacharias (Id., p. 50), Carl, the butcher (Id., p. 159), Scherich, insurance agent (Id., pp. 180–1), I. D. Kahney (Id., p. 204), C. Eberly (Id., p. 117), Smyser (Id., 78–9), Baylor (Id., p. 153), Snyder (Id., p. 515), Smith (Id., p. 340), Condry (Id., p. 142), Brooks (Id., p. 44), Baisley (Id., pp. 194–5), Bricker (Id., 511), Bates (Id., 419), Herr (D. Vol. 2, 668), Wolf (Id., p. 675), M. Fry (D. Vol. I, 182–6), Good (D. Vol. I, p. 199), Dellinger (Id., p. 443), Milner (D. S. Reb., 514), Kline (D. Vol. I, 627), Clifford (Id., 516), Clendenning (Id., p. 523), Hamacher (Id., p. 293), Chellis (Id., p. 525), Millard (Id., p. 331), Hiler (Id., p. 383), Kohler (Id., p. 545), Geo. W. Drawbaugh (Id., p. 603), Jeffries (D. Vol. 2, p. 684).

Though an active inventor, yet from the year 1867 he applied for no patents until the time when the Clock Company and Chellis furnished the money for the faucet and clock patents in 1878 and 1879. For a list of all his patents to the year 1880, see D. Exhibits 82, 97. It is almost beyond belief that this record should be attacked by specious arguments and assumptions in the effort to break down the evidence. The assumption that all the money required was the mere fee for getting the invention patented is absurd on the face of it; but even this money he never had at hand. It would almost seem unnecessary to support the theory that Drawbaugh was poor, by doing more than cite the public records of the county.

Certain it is that those records should preclude any assertion that the theory of poverty was formulated to fit the case. Judgments are a lien upon real estate in Pennsylvania, and defendant's book of exhibits shows the following liens upon the equity of redemption—it can hardly be called the ownership—in the homestead:

April, 1868, to May 3, 1869, $310, interest and costs.

May 3, 1869, to Mar. 26, 1870, $1,810, interest and costs.

March 26, 1870, to May 17, 1871, $910, interest and costs.

Nov. 17, 1871, to Jan. 11, 1872, $910, interest and costs.

Jan. 11, 1872, to Feb. 20, 1873, $1,910, interest and costs.

Feb. 10, 1873, to March 17, 1873, $2,022.67, interest and costs.

Mar. 17, 1873, to July, 1873, $2,113.49, interest and costs.

July, 1873, to Dec. 18, 1875, $1,805.49, interest and costs.

Dec. 13, 1875, to April, 1876, when the house was sold to Fettrow, $1,833.30, interest and costs. (*Defendant's Exhibits, p. 26, et. seq.*)

It will thus be seen that during the whole time of the ownership of the two pieces of property it was incumbered, sometimes to its full value, and that the credit they gave to Drawbaugh he was forced to use to its fullest capacity.

Notwithstanding the undoubted testimony that his wife refused to join in utilizing the equity in the property to raise money to put into the talking machine, it is gravely urged against Drawbaugh that his story is improbable because he did not sell the homestead, to raise money to introduce the telephone.* But the court below says, in effect, that the story of his poverty was a fabrication formulated in the answer. The answer was "formulated" and filed in January 1881. The complainants' witness, Matthews, of whom the learned judge speaks most approvingly in the opinion, in his Baltimore American article (*I Comp., p. 541, 543, top*), in speaking of the impression made upon his mind by a visit to Drawbaugh in April, 1878, says: "This unlettered country mechanic came very "near anticipating Edison and Bell in the invention of the "telephone. *Nothing but his poverty prevented him from* "*conducting his experiments to a successful issue.*"

And the court below says that Drawbaugh is "dishonest" in his pretense of poverty!

WAS DRAWBAUGH A CHARLATAN?

The able opinion of the Circuit Judge is exhaustive in its treatment of Drawbaugh as a conspirator, a perjurer and as a general fraud.

We have discussed the evidence upon which this theory rests, with the exception of that on which this charge rests. It is found in J. C. Nesbit's testimony (*1 Comp. 687*), in "The History of Cumberland County, Pennsylvania, by Rev. Conway P. Wing, D.D., and others, 1879," published by the Herald Printing Co., of

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*See opinion, p. 16.

Carlisle, Pa., and containing at p. 200 of said publication an article headed, "Lower Allen Township, by J. C. Nesbit."

The court assumed that the biographical sketch (I Comp. p. 705) was written by Drawbaugh himself; but it appears distinctly on the defendant's cross-examination of the witness and the production of the original manuscript, which was under the control of the complainants, and not by them at first produced, that it was in the writing of Hull. It even left the date of Drawbaugh's birth blank, which was supplied in the published article.

Now, the main facts in this biographical sketch are undoubtedly truthful, as is shown by the whole record here. The florid style of the article, on which alone the charge of charlatanry is based, is evidently that of the provincial newspaper man, and entirely foreign to Drawbaugh's. It abounds in terms not possible to Drawbaugh, as shown by his simple methods of thought and expression in the 332 pages of his deposition, which conclusively answers this last attempt to picture his opposite as Daniel Drawbaugh.

V.

A BRIEF SKETCH OF THE CONCEPTION AND PROGRESS OF DRAWBAUGH'S TELEPHONE.

He himself says he cannot remember the date when he began to study the subject, and that "it was a long while ago." He had experimented with the vocal organs by placing his hand upon the throat and feeling the vibrations of the vocal chords, and the fact that sound had the effect to set up vibrations in solid substances he had learned by noticing the effect upon the surface of partitions, and by experimenting in the effects produced by extending a light wooden bar between partitions, and then by causing a vibration upon one partition, discovering that the bar transmitted the same vibration to the opposite partition. He pursued the principle always, that the current must not be broken, and from the first his conception was of a continuous current.

His idea of pulverized matter is, in this connection; interposed in the current, not breaking it, but causing a greater or less flow, as the particles form a greater or less resistance to the passage of the current as they might be pressed together with more or less force. He speaks of conversing with medical students at Washington, D. C., about the transmission of sound as long ago as January, 1861, the date of the visit being fixed positively by a receipt taken in Washington *(D. Vol. 2, p. 752)*, and states that he then had his mind employed on the subject.

Henry B. Averly *(D. Vol. 1, p. 184)* testifies that between 1861 and 1864, and during the war, Drawbaugh, in the mill office (Averly's grist mill), in the presence of several witnesses, including the witness, spoke of attaching an instrument to the office in the mill, by which he could hear all that was going on there without leaving his house. Averly moved away in 1873, in May, and has never been to the county since, and Drawbaugh moved out of that house in April, 1868, and never again lived in it while the witness was a resident of Cumberland County.

In the argument below counsel for complainants said of David Stephenson, resident of Harrisburg, that he was a machinist, and " worked for and with the Faucet Com-" pany (of which Drawbaugh was superintendent), as a " maker of patterns, in 1867 and 1868, and that he and " Drawbaugh had many and intimate relations with each " other ever since. They appear to have been partners or "jointly engaged in the manufacture of certain pnmps. "He has been and still is a friend of Drawbaugh's. Now, "here is a machinist and a machine-shop man, a keeper of "machinist's supplies stores, intimate with Drawbaugh, "having worked for him in his shop—quasi-partners. " * * * If there was a telephone there he must "have known everything about it; but they did not put "him upon the witness-stand." (*Complainants' Argument*, "*pp. 201, 202, and quoted in witness' testimony*). In the Additional proofs taken in the "*Overland*" case, this gentleman, who is highly spoken of, was put upon the witness-stand, and he testifies that he *did* know all about Drawbaugh's Electric Speaking Telephone; that Drawbaugh showed it to him while Drawbaugh lived, in that house close to the grist-mill, during Drawbaugh's first occupancy of that house, which occupancy terminated in the spring of 1868. He shows that Drawbaugh repeatedly experimented with the instruments, with his assistance. He shows that the instruments were connected by wires, and that the wire came from the outside of the building from a porch, and that the wires ran zig-zag (back and forth) "to give length to the wires," and that Drawbaugh told him it was operated by electricity. He talked through the instrument from one room to another. Later, in 1874–5, he says (*Add. proofs, p. 145*): "He sent me to the cellar, "and after giving me a small instrument in my hand, he "suggested that he would go onto the upper floor and "speak to me and I should let him know what he said, and "how distinctly I heard it. * * * I heard him speak- "ing short sentences and singing, and then went up-stairs "and met him coming towards me, and told him what he "said. I heard him very clearly, and I didn't miss any

" words in repeating what he said, excepting his singing; I " didn't repeat that.

Q.—" How did the sounds, heard through the machine " that day, compare in loudness and distinctness with those " which you heard through the old machine at the shop at " the grist mill, as you have testified?

A.—" With more force and clearness at that last " time."

He is corroborated as to the later dates by his daughter.

We have the testimony of Prof. Samuel B. Heighes as to Drawbaugh's great interest in physics and particularly in electricity and of his talking of speaking through an electric wire by electricity in 1859 and 1860, and witness *saw* the telephone there in 1871-4. (*D. S. Reb. p. 91*).

Mr. Lory, a carriage-maker, (*D. Vol. 1, pp. 225-7*), says that Drawbaugh told him in 1864 that he was about making a machine to talk through a distance of twenty miles; it would work like a telegraph, but that you would have to talk into it. Witness had understood that Drawbaugh had conceived it and had plans made and was going to make the machine. Witness was never at Drawbaugh's shop since that fall. The date is fixed by the witness being at the grist mill to fix Christian Eberly's buggy wheel, and John B. Drawbaugh fixes the date by a book of entry. (*D. Vol. 1, p. 85.*)

Samuel H. Bates (D. S. Reb. 380) testifies to a talk about Drawbaugh at that early period, and of his claim of inventing a talking machine.

Mrs. Mary Ann Darr testifies to having heard Drawbaugh's talking machine talked of in 1866, before her daughter worked in Drawbaugh's family. Same point of date, 1867, Christian Eberly (D. Vol. I, pp. 113-14).

James A. Smith, the postmaster at New Cumberland, of the date of 1866. He moved away in 1867, and he states that Drawbaugh told him that he and his daughter Emma had talked together with a floor and two partitions between them. The daughter referred to died November 18, 1871. (D. Vol. I, p. 751.) Drawbaugh himself is corroborated as to the form of the instrument, by Lory (*supra*), who testifies his first telephone apparatus was a teacup, and thinks he had that machine before he took out his two faucet patents, November 20, 1866, and knows that he then made his shop in the old clover mill now occupied by him. The date of this removal is fixed at 1867.

The teacup transmitter is not in existence, but its construction and mode of operation are set out by Drawbaugh (*D. Vol. 2, pp. 756, 764*), and is illustrated by the sketch on page 788, and illustrated by another sketch of its construction and of its use in a battery circuit on page 795.

Here was the principle of the telephone, and of the carbon transmitter, beyond any sort of question, though the low conductor used at first was not carbon, but was of earth and of other materials. He cannot fix the point of the evolution at which he can describe exactly what he used as a receiver at first, as he was repeatedly experimenting, trying one thing and another, and the first that he is able definitely to describe is shown in the sketch on page 762 of his testimony.

The early experiments prior to 1868 are further shown by the following witnesses ; Mrs. Jane M. Brown, (*D. S. Reb. 163-170* ; Mrs. Darr, (Id., p. 110) ; Mrs. Brenneman, (Id., p. 309); Samuel Snell, who remembers an experimental telephone line from the shop to the office of the grist-mill in 1867. (*D. S. Reb., pp. 412-18*). The witness had never been in Milltown to stop since the day he saw that machine in 1867. By James Davis in 1867, after harvest, when Drawbaugh's shop was in the clover-mill. (*D. S. Reb., pp. 418-421.*) George B. Eyster, sheriff of Cumberland County, (*D. S. Reb., pp. 890-91*), was at the clover-mill in company with Geo. B. Heck, who died in July—see Barber, (Id., pp. 272-3); Natcher, (Id. p. 150). By John B. Heck, (Id., p. 192), who looked at some of Drawbaugh's inventions. By Henry Kilmore, (Id., pp. 1,124, 1,128) of 1867, who saw talking machines right back of grist-mill, in company with Michael S. Drawbaugh —who died March 16, 1871. (*Date of death fixed by Kilmore, Millard, Adam Drawbaugh, Id., pp. 1040, 1,098, 1100*).

By Jacob A. Graham, (*Id. pp. 1,357, 1,069,*) as of 1867.

By Geo. Murphy, of Newville, of Ahl & Sander's distillery, from Nov. 22, 1866, to June 1, 1867, (*Id. pp. 1,063, 1,066*).

By John S. Dougherty, merchant of Newville, (*Id. pp. 1,131, 1,134*), as of 1867.

By Wm. Darr, one of the complainants' rebutting witnesses, (*C. Vol. I., p. 358*). This is the witness who advised Drawbaugh to try Yellowbreeches Creek first, before he tried to talk across the Atlantic Ocean.

By his wife, (*D. S. Reb., p. 110*).

With the exception of the old tea-cup transmitter, (*2 D., p. 756*); representtions of all the instruments are in evidence, in whole or in part; parts of those produced prior to the instrument "I" of 1871 being in evidence, and "I," with all thereafter produced being in evidence in their entirety. The temporary experimental structures, the changes in parts and construction, great and small, in working out the great discovery, are not here, and of the thousand and one efforts made in the progress of the invention, there is no memorandum. We submit, it is not to be conceived that any mere memory could recall them. (*Drawbaugh, D. Vol. 2, p. 828.*) Harmon K. Drawbaugh knew generally of their experimental constructions Henry F. Drawbaugh, (*D. Vol. I, p. 406*).

Faraday's experiments, which resulted in the discovery of the induction current, marked an era in electric science, and to reach it he experimented from 1824 to 1831. He kept a record of his experiments. Had he not, imagine Faraday at a period subsequent to his discovery, attempting to give from memory the first and second, and the myriad of other things, and details, small and great, the smallest of the greatest results, and the greatest of the smallest, during these years leading up to the result. And, yet, one of the strongest criticisms of Drawbaugh appearing in the arguments of counsel, and even in the opinion of the learned judge at circuit, was that he was unable to describe all of his first experiments.

In the series of instruments and drawings produced, the development from one to the other appears to have been perfectly natural, from the loose, pulverized, low conductor, to that of the closely confined, so that the pressure might be rendered more easily adjustable; the evolution from the first rude instrument sketched in Drawbaugh's testimony just referred to, to the tumbler transmitter "F." (*P. 7 of Defts'. Instrument Exhibits.*) In this also is seen the progress to the wooden cover and mouthpiece upon the diaphragm, in which the membrane diaphragm had given place to the metal one. (*Id. p. 8.*)

In experimenting with the receiver we find him abandoning the unnecessary parts in the tin can ".B" (*Id. pp. 2 and 3*), as from the latter is evolved the later and more perfect instrument " C." (*Id, p. 4*). Upon using " C," and finding that it would transmit, though feebly, using " B " as a receiver, he then places a permanent magnet against the heel of the electro-magnet and finds a great improvement, and Exhibit " C " as a transmitter is the result. (*Id. p. 5.*)

In the next improvement in this machine he encloses the parts, and, of necessity, makes them compact. The experimental magnet is then arranged, and from this comes Exhibit " I " (*Id. p. 13*), with its several improvements, until Exhibit " A " is the result; later " C " and " I," still having a large diaphragm, were observed to give out a false vibration, and then he conceived the idea of dampening them to prevent the false vibration, by means of an adjustable rubber pad, and then moved the mouth orifice to one side and applied the dampened pad and screw. This not succeeding, he then determined to reduce it in size, and found the best results. After having made crude instruments to test and settle the matter, and finding his conclusions verified, he reconstructed the two into two compact working instruments, " D " and " E," in February, 1875. (*Id., p. 6.*)

From the time of his discovery that the instrument " B, " as improved in " C ," would act as a transmitter, by application of the permanent magnet, he had thus far proceeded directly in the line of improvement of the magneto transmitter, and had done nothing with the carbon instrument, although he used it quite commonly in connection with his other experiments. At this period, in 1875, he turned his attention again to " F, " the carbon-transmitting instrument. He experimented with carbon, and Halsinger saw him baking carbon composition into cakes (I Defts., p. 366). After experimenting with these cakes in the trial tumbler instrument (Halsinger, Id.) he rearranged them and produced Exhibits "L" and "N," (Id. p. 17 and 18), and combined in them the receiver and transmitter. Then he constructed a pair of transmitters with hard carbon, without combining the receiving mechanism in the same instrument, and from this we have "G" and "O," (Id. p. 7, right; p. 20, left).

The story of Drawbaugh then, and of the record, overwhelmingly corroborated by the witnesses for the defense, is as follows:

Early conception and experiments with the continuous current, 1862, 1866 and 1867.

Teacup transmitter and receiver, 1866 and 1867.

Tumbler and tin cup and mustard can ("F" and "B"), 1867 and 1869.

Improvement upon "B" ("C"), 1869, 1870.

Further improvement upon "C" and the more perfect magneto instrument "I," 1870, 1871.

Mouth-piece changed to center, and adjusting screw inserted (Exhibit "A"), 1874.

"D" and "E," perfectly adjusted and finished magneto instruments, January and February, 1875.

"L," "M," "G" and "O," from February 1875, to August, 1876.

"H," August, 1876.

"J," "N" and "P," 1878.

In connection with the later instruments there is a piece of testimony that seems to us conclusive in favor of Drawbaugh, upon the question of his ability to invent the telephone, and in favor of our theory of the gradual progress of his experiments from the crude instrument, patentable, and a speaking telephone, to the perfected and nicely adjusted one.

It is a matter of history, as well as in the record, that the Blake carbon transmitter is in use upon the most of the Bell instruments at this time. Blake's sworn statement in the Patent Office, in an interference, shows that he never even conceived the Blake transmitter invention until after July 4, 1878, and that he never made a Blake transmitter until late in the fall of 1878. The other side have put in evidence Blake's patent, which was not granted until long after the date of the commencement of this suit, so that by law and by the rules of the Patent Office, Drawbaugh could have got no knowledge from it. It is further in evidence in complainant's testimony (*See Ziegler, Vol. I, Comp. tes., p. 1,032*), that the Blake transmitter instruments were not put into use until the spring of 1880, and that the telephones in use prior to that time were of a form known as the "Phelps' Snuff-box" instrument, and the "Crown" and "Pony Crown" instruments, so that it is not possible, under any conceivable circumstances, that Drawbaugh could have derived any ideas from the Blake transmitter as early as May, 1878. Drawbaugh's perfected carbon instruments "N" and "J," as shown by Stees and Johnson (*Add. proofs, pp. 956, 970*), who testify in the most minute, circumstantial and positive manner, corroborating Drawbaugh in his testimony, were taken to the office of William J. Stees, in Harrisburg, in 1878. They fix the time absolutely beyond doubt, as the 10th day of May, 1878, and that the instruments remained at Stees' office several months. They both identify the instruments positively, and testify that while they were at the office they put them on the telephone line and talked through them, and that they worked admirably; that they saw the instrument, "Exhibit J," and recognize the parts in it just as shown in the exhibit; and Stees further testifies to the important fact, that while the instrument "J" was at his father's office, he took it in his hands to carry it across the office, in order to change its location, when his father accidently ran against him, and he dropped the instrument, and that he discovered at that time that the small, hard carbons which the instrument contained had become loose and fallen out.

William J. Stees is the gentleman whom the complainants show introduced Drawbaugh to the Western Union Telegraph office, to look at a telephone (Ziegler, Comp. vol. I, p. 1,032), and was accidently killed at the very outset of taking defendant's testimony in the case. (Add. proofs, p. 970.)

WHY HE WAS SEEN BY SOME OF THE WITNESSES WORKING WITH THE EARLIER MACHINES AFTER THE PERFECTION OF THE INSTRUMENTS "D" AND "E," ON OTHER EARLIER MAGNETO INSTRUMENTS.

Some of the witnesses testify to seeing the tumbler "F" and the tin-can "B" as late as 1877. But the fact looses all force against the defense, when it appears indisputably proved, and is beyond the ability of conspiracy to have fabricated, that Drawbaugh, on discovering that the magneto receiver "B," as improved and organized in the improved "C" in 1870, would serve as a transmitter, temporarily abandoned the variable resistance transmitters, "F" and "B," and did not return to experiments and progress on them till 1875.* From them, through a series of experiments and improvement, came

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See Nesbitt sketch of Drawbaugh referring to the two kinds of telephones, I Complt., 706.

finally the perfect carbon instruments taken to Stees' office in 1878, above referred to.

THE TESTIMONY AND THE COMMENT THAT DRAWBAUGH WAS STILL EXPERIMENTING, AND SAID THE MACHINE WAS NOT PERFECT, AT TIMES WHEN DEFENDANTS' EVIDENCE SHOWS HE HAD ACCOMPLISHED THE INVENTION.

Aside from the fact already shown, that he was at work on the magento and carbon instruments at different times, there is a very simple answer which appears incidentally and naturally throughout the record. No effort was made to bring it out, and it appears in the testimony of witnesses, as in that of Drawbaugh, without consciousness on their part or his, that it was of any special consequence.

It is this: That the instrument in his view "was not loud enough for practical purposes" (*Drawbaugh, II Dfts. p. 1058, X. Q. 1612*), unless it would talk, without holding to the ear, and convey the sound as far as ordinary speech. He wanted it to talk out as a man talks.

As George Free (*Dfts. I., p. 488*) puts it of his conversations with Drawbaugh in 1876, 1877, 1878 and 1879: "He told me that he wanted to accomplish, and could do "it, to make a machine that you could stay in one corner "of the room, and putting the machine in the other "corner, and hear as distinctly as putting it to the ear," and that Drawbaugh told him that he had not done it yet, but "I am working at it and I am going to get it accomplished." See, also, Drawbaugh, D. Vol. 2, pp. 805, 829, 830, *et seq.*, and Jeffries, Id. 679.

When that journal of civilization, the *New York Tribune*, thought the only use of the telephone would be for "diplomats and lovers," (*C. Vol. I, 1, p. 250*); when the *Scientific American* summed up the public opinion of it as "a beautiful scientific toy," (*C. I., p. 273*); when Gardner G. Hubbard, a telegraph manager, and Prof. Bell's financial backer, "did not then believe the transmission of speech could be made commercially valuable." (*C. II., p. 1662, and Complts. Exhibits p. 959*); when President Orton, of the Western Union Telegraph Company, ignored it from 1876 to 1878 (*C. I., p. 270*); when all his friends laughed at him; it cannot be wondered at that Drawbaugh, in the little village of Miltown, years before, should not have realized that his instrument~~s~~ had reached practical perfection when it would talk, only by holding the receiver to the ear.

OF THE CRITICISM THAT DRAWBAUGH DID NOT MAKE KNOWN HIS INVENTION TO HIS ASSOCIATES IN THE SHOPS WHERE HE WORKED.

This charge, like many others, has nothing to rest upon.

The Axle Company carried on business at the shop now occuied by Daniel Drawbaugh. It was composed of M. M. Grove, Wilson Baer and Captain J. A. Moore. It commenced business on the 23d day of December, 1874, and dissolved on the 29th day of February, 1876. All three, Baer, Moore and Grove, testify to their knowledge of the talking machine (*D. I. 614, 635, 662*) during the operations of the company, and as we have seen, Drawbaugh applied for assistance to all of them.

Of the old Faucet Company, which commenced business in 1867, the secretary and treasurer, Dr. N. B. Musser, is dead; but it appears by the testimony of Prof. Samuel B. Heighes (*D. S. Reb., p. 95*) that Musser was with him at the examination of the talking machine in May, 1872. Musser was his brother-in-law. W. R. Gorgas, a bank clerk, now thirty-three years of age, residing at Harrisburg, testifies to the fact that the Faucet Company was a failure financially; that he left the shop in September, 1869, and took very little interest in the affairs of the company. He is not called by either party on the point of knowing anything about the talking machine. He testifies that he was sick of patent rights through the failure of the Faucet Company. He remembers that Drawbaugh came to him and wanted him to take a half interest in some invention, he forgets what; but as the witness had lost about $4,000 in the old company, he "had had a surfeit of it and didn't pay any attention to it." (*D. S. Reb., p. 1128.*)

John F. Hursh was a member of the old faucet company until 1871, and he testifies that he didn't know of the talking machines. For the value of his testimony we have no comment to make, save to cite his manner of testifying. (*I. Comp., p. 1060.*) "Q. 50.—Are you able to swear "that, as a matter of fact, Drawbraugh did not have elec-"tric speaking telephones in his shop for at least seven or "eight years prior to 1876, and show them to a great many "different persons during those seven or eight years? A.— "I am — that he did not have them. Q.—Do you swear "that positively? A.—I do. Q.—How many times were "you in Drawbaugh's shop in 1876, prior to your buying "the ram? A.—I can't say. Q.—How many times were "you in the shop in 1875? A.—I can't say. Q.—How "many times were you in the shop during the year 1874? "A.—I can't say. Q.—How many times were you in the "shop in 1873? A.—I can't say. Q.—How many times were "you in the shop in 1872? A.—I can't say. Q.—How "many times were you in the shop in 1871? No answer. "Q.—Do you remember any particular occasion of being "at the shop in 1872? A.—I don't. Q.—Do you re-

" member any particular occasion of being in the shop in " 1873? A.—No, sir. Q.—Do you remember any particular occasion of being in the shop in 1874? A.— " No, sir. Q.—Do you remember any particular occasion " of being in the shop between 1876 and the time you " ordered the ram? A.—No, sir. * * * Q. 69—Mr. " Grove, one of the members of the Axle Company, has " testified, after they went into business at Drawbaugh's " shop, which would bring it at a period early in 1875, he " saw a talking machine in Drawbaugh's shop; I suppose ' you don't know what Grove did or did not see at Drawbaugh's shop? A.—I could not tell about Grove; I don't " know. Q.—Mr. Baisley has testified that in Nov., 1875, " he saw talking machines in Drawbaugh's shop; I suppose " you don't know whas Baisley saw or did not see, do you? " A.—I don't. Q.—Mr. D. W. Smith has testified that " in 1874 he saw a talking machine in Drawbaugh's shop; I " suppose you don't know what he did or did not see, do you? " A.—No, sir. Q.—The same question as to Samuel S. " Crawford? A.—I don't. Q.—The same question as to " George L. Hale, in 1873? A.—I don't. Q.—The same " question as Henry Baylor, in 1873? A.—I don't. Q.— " The same question as to Smyser? A.—I don't;" and so on through the instances of the various persons who had sworn they had seen the telephone. " Q. 64 (p. 1,062)— " Are you willing to swear, as a matter of fact, Drawbaugh " did not have talking machines in his shop at least four " years prior to the beginning of the Centennial year, 1876, " and show them to many different persons during those " four years? A.—I am."

Now, here is a witness to depend on. He is a partisan, and he swears for his side, without regard to consequences.

Jacob A. Shettel, a member of the clock company, testifies, and fully and positively corroborates Drawbaugh. (D. I., p. 206.)

Emanuel A. Gregory, a member of the old faucet company, and his son Joseph, who both worked in the shop, fully and positively corroborate Drawbaugh. (Add. proofs, p. 181–5.)

John C. Schrader and E. B. Hoffman, and David Stephenson, hereinbefore referred to, connected with the faucet company, give the strongest possible testimony for the defense. (D. S. Reb., p. 467 ; D. I., p. 481; Add. proofs, p. 140.)

In the Axle Company, the work was largely done by Daniel, H. K. and J. B. Drawbaugh (*D. I. pp. 575--98*). Daniel Fettrow, John Wolf and Augustus Kahney (*D. I. pp. 347, 266--73; S. Reb., p. 254*), all testify to a perfect familiarity with the work on the machines and the machines themselves.

Theodore Grisinger (*I Comp., p. 511*), a member of the Clock Company, testifies for the defense. The Clock Company started in the spring of 1878. He testifies to a conversation with Drawbaugh in the spring or summer. The tendency of his testimony is to show that there was no telephone there, and that Drawbaugh was merely experimenting. Inasmuch as he swears he did not see Exhibits "F" and "B," and swears that, as a fact, he could not have seen them and have forgotten them, while we know that they were there, from the complainants' testimony, and they are admitted to have been there in 1876 and 1877, as we have seen. We submit his testimony is of no weight. He did see two telephones at some time, and says that he has seen Exhibit "A" somewhere, and must have seen it at Drawbaugh's shop.

The other member of the Clock Company is dead.

Jacob Carnes (*Comp. I, p. 883*), worked in the machine shop at Eberly's Mills for the Drawbaugh Manufacturing Co., from 1868 to 1871, and boarded in Drawbaugh's family. He testifies that he did not see any telephone and never heard that one had been invented *previous to 1880*. He is thoroughly contradicted by Mrs. Margaret Brenneman, (*D. S. Reb., p. 103*), who lived in the family at the time Jacob Carnes was a boarder there, and she is corroborated by her mother, Mary M. Darr (*Id., p. 109*), and by John C. Schrader, who boarded with him, *supra*. Of course, his testimony is absurd, because it is beyond question, and is admitted on all hands, that all the telephones were made prior to 1880.

VI.

DEFENDANTS' TESTIMONY.

We now refer to the testimony of the members of the community at and about Eberly's Mills, of the visitors there, and of former residents of that place, covering the period of Drawbaugh's history of his invention of the telephone, and of the various stages in its improvement.

WILLIAM H. ZEERING.

(D. S. Reb., p. 122): Age 41; Shiremantown; farmer, also Secretary of School Board of Lower Allen township. In the fall of 1873, witness went to Drawbaugh's shop to get a pair of steelyards re-lettered. He testifies that he took them there, and Mr. Drawbaugh looked them over and said he would re-letter them, and that witness should call in the course of a week or two, and he would have them finished. Witness testifies that several years before the time mentioned he had been at Drawbaugh's shop, and the latter had shown him a talking machine; but witness considered it "rather of a humbug," and so expressed his opinion to Drawbaugh. When witness went to get his steelyards, Drawbaugh again showed him his talking machine and talked through it to him, witness listening at the north-east corner of the building, on the third floor, and Drawbaugh talking somewhere down-stairs. Part of the conversation — and a very striking part — witness remembers, namely, that he heard through the machine the words "the steelyards are finished." The door of the room was closed, and witness could not have heard the words, except through the talking machine. The date of this occurrence is positively fixed by a book entry which the witness produces, as follows: "Nov. 25, for re-lettering steelyards, per (D. Drawbaugh) 35," and the testimony of witness that this was the only time that he ever had a pair of steelyards re-lettered by Drawbaugh. The witness further testifies that after hearing those words he considered the invention a success, instead of a humbug; and it is very natural that after the opinion which he previously formed of the instrument, and his distinct hearing through it of the words relating to his particular business at the shop at that time, that they should be indelibly impressed upon his memory. Whilst witness does not positively identify the instrument through which he heard these words, he says that "B" looks like the instrument which he saw when first at the shop, and "I" like the one he saw when the talking took place.

DR. C. B. UPDEGRAFF.

(*D. Vol 2, p. 1081*): Age, thirty-eight; residence, Philadelphia; formerly resided at Harrisburg; made three visits to Drawbaugh's shop, first on the 5th or 6th of May, 1874, and the second and third, as the witness supposed, in *April* and *May* — but as it subsequently appeared, in June, 1875, but certainly in the spring or summer of the year following, after the first visit of 1874. (See Boyle, Add. Proofs, pp. 45-6, Ansrs. 19, *et seq.;* Stackpole, Id., p. 73, *et seq.*, Ansrs. 18, *et seq.;* George F. Weaver, Jr., Id., p. 101, Ans. 5.)

The date of the third and last visit is fixed beyond all question by the testimony of numerous witnesses, besides those referred to. (*Add. Proofs, pp. 36, 113.*)

Witness has no recollection of ever having been at Drawbaugh's shop after the third visit, and left Harrisburg and went to Philadelphia early in the spring of 1876, where he remained all through the Centennial year. He removed his family to Philadelphia in 1877 and has ever since resided there. During the 1874 visit he saw the talking machines. Identifies "B," "C," and "I" and possibly "A," as seen at that time. During his second visit, which occurred early in June, 1875, he saw "D," "F," and "B," in addition to those mentioned before. His identification of "D" and "E" is very striking. He was a physician and surgeon, and had made a specialty of the eye and ear. He conversed with Drawbaugh on the internal organization of the ear, and testifies that the latter had an instrument which particularly attracted his "attention on account of the peculiar shape of the magnet. I had never seen anything like it before. It had a magnet of a peculiar shape. * * * It resembled the ear — the external part of the ear—in shape." It does not appear that he heard any talking through the telephone at his first visit; but he did at his second visit, and distinctly understood what Drawbaugh said to him through the talking machine. Witness cannot identify machines which were talked through, inasmuch as he handled them all, and cannot remember distinctly which ones were used. On this third visit he also saw talking machines, but did not listen to any speech through them.

The testimony of this witness is also important, as representing the enthusiasm of Drawbaugh in his invention, his confidence in its future utility and its electrial operation.

He is corroborated with regard to the dates of his visits by Thomas Updegrow (*D. vol. 2, p. 1,098*), John Henry Smith (*D. vol. 2, p. 1,093*), and by a number of witnesses hereafter alluded to.

In the argument at New York his dates were attacked mainly upon two grounds: first, because he testified that on this second visit he, in company with Boyle, floated down the Yellow Breeches Creek from Zacharias' Mill to Drawbaugh's shop—John J. Zacharias having testified that he lived at New Cumberland Mills, at the mouth of said creek, from the fall of 1868 to the spring of 1876. (*D. Vol. I, p. 48, Ans. 9; pp. 50, 51, Ans 39.*) Second, upon the ground that there was no store at Eberly's Mills in the spring and summer of 1875; Smith, who accompanied witness on the third vlsit, having testified (*D. Vol. 2, p. —, Ans. 3*), that he went to a grocery store at Eberly's Mills to get some things which were necessary for breakfast; but in the testimony which was brought forward in the Overland case, these criticisms were entirely overcome, first, by showing that John J. Zacharias was mistaken as to the date when he left the New Cumberland Mills, Elias Hake, the owner of the mill above Eberly's Mills (Add. proofs, p. 107, *et seq.*), producing a lease from himself to John J. Zacharias of his mill, dated March, 1875, for the term of one year from

April 1, 1875, and testifying, that under that lease Zacharias went into possession of his mill on the first of April, 1875; and, second, by the testimony of Jeremiah Fry (Add. proofs, p. 120), who testifies, that from March, 1875, up until October 1, 1875, when her husband opened a grocery store there, Harry Gardner, postmaster at Eberly's Mills, kept for sale a few grocery supplies, such as sugar, coffee and matches.

The testimony of this witness is further corroborated by the depositions of Updegrow (D. vol. 2, p. 1,098), J. H. Smith (D. vol. 2, p. 1,093), McGaffick (Add. proofs, p. 36), Breneizer (*Id.* p. 40), Boyle (*Id.* 44), Stackpole (*Id.* 72), Irwin (*Id.* 81), John H. Updegraff (*Id.* 83), Goldsmith (*Id.* 91), Strouse (*Id.* 93), John Young (*Id.* 97), George F. Weaver, Jr. (*Id.* 101).

M. P. SMYSER (D. vol. 1, p. 74): Age, fifty; residence, Lisburn, Cumberland County; auctioneer; was employed at the State Arsenal, Harrisburg, from June 1, 1870, till June 30, 1873 (see Diven, D. vol 1, p. 74), during which time he occasionally visited Drawbaugh's shop, on his way to and from Lisburn, where he then resided. During 1871, or 1872—not later than 1872—when he was fearing discharge, because of change of State administration, he stopped at Drawbaugh's shop with reference to a magic lantern which he contemplated exhibiting, in event of his discharge from service at the arsenal, witness being a crippled soldier, who had lost an arm in the Battle of the Wilderness. At this time Drawbaugh exhibited to him instruments "B" and "F," "F" being in the cellar, and "B" on the upper floor of the shop, two stories above, and the instruments being connected by two green cords similar to the wrapped wire of the electro magnet of "B," as now in evidence. Drawbaugh directed a boy to sing and talk in the cellar whilst he and witness went up stairs and listened at "B." So listening, witness distinctly heard the boy sing "Don't you want to be a Christian while you're young?" Not only distinguishing the music, but understanding the words. Drawbaugh thereupon opened the door and called down to the boy to whisper, whereupon witness heard the boy count "One — two — three — four — five," in a whisper. The doors were closed between the cellar and the upper floor. Drawbaugh told witness at the time that the instrument was operated by electricity, and that he could make a talking machine that could talk from there to California.

The evidence of this witness is further important as showing a continuous subsequent work of Drawbaugh on these instruments.

ISAAC B. MILLARD (*D. Vol. I, p. 324*):

Age, thirty-six; residence, Newberry Township, York County; farmer. (President of school board.) Was married November 11, 1869, shortly before which time he lived for awhile at Eberly's Mills. Moved to Harrisburg December, 1869, and continued to reside there until August 20, 1874, when he moved upon a farm in Newberry Township, York County, purchased by his father-in-law, and there continued to reside up to the time of testifying. Whilst living at Eberly's Mills, before his marriage, saw "B," and heard some one—he cannot remember whether it was Drawbaugh or some one who was with him at the shops—talk through it. Witness listened at "B," on the second floor of the shop, the person doing the talking being on the hill or bank outside of the shop and some distance away. Heard and understood. About the time witness moved upon the farm, and prior to the opening of the

Centennial, he saw at Drawbaugh's shop other talking machines, which he identifies, particularly "A," "D" and "E," through all of which Drawbaugh talked to him. When experimenting with "A," witness used it as a receiver in the upper story of the shop, Drawbaugh talking in the basement. Witness heard and understood what was said through it. When experimenting with "D" and "E," conversation was carried on both ways, witness using one of the instruments, both as a receiver and transmitter, and thus carried on conversation with Drawbaugh, so as to be mutually understood. The last of these experiments was made in cold weather, prior to the Centennial. Witness did not again visit Drawbaugh's shop until February or March, 1880.

Witnesses who talked through telephone:

ABRAHAM B. SHANK.

(*D. Vol. I, p. 19*): Age, forty-nine. Constable of Lower Allen township, Cumberland County, Pennsylvania, for the last seventeen years. First saw talking machine at Drawbaugh's shop "about in 1869" (Ans. 4). Fixes date by removal to new residence in spring of 1870 (Ansrs. 73, *et seq.*) Listened at "B" whilst Drawbaugh talked into "F." Understood and distinguished Drawbaugh's voice. Describes missing parts of instruments. Subsequently, at various times, heard Drawbaugh talking from floor to floor through different instruments.

This witness testifies to the electrical character of the instruments at the time he first saw them, in that they were connected by two wrapped wires. His deposition is also very important on other points, including the poverty of Drawbaugh, his continuous work upon the talking machine, its electrical character, etc.

WILLIAM J. MACLAUGHLIN. (*D. S. Reb., p. 750*):

Age, fifty-six; Harrisburg; painter and paper-hanger. Was at Drawbaugh's shop in company with E. B. Hoffman at the time of the great flood along the Yellow Breeches Creek in August, 1875, and saw and heard Drawbaugh speak through his talking machine; does not identify instrument at which he listened, but selects "I" as one, or similar to one, which he saw there at that time; Drawbaugh was up stairs and witness down stairs; talked both ways; understood and remembers words. Drawbaugh asked me through the machine "if I could understand him." I answered him, "Yes."

There can be no doubt as to the time of this visit. The flood on the Yellow Breeches Creek in August, 1873, is overwhelmingly established by the testimony of many witnesses, and is admitted by the complainants upon the record. (*See Complainants' vol. 3, top of p. 1,925.*)

JACOB H. RENEKER (*D. vol. 1, p. 233*):

Age, 50; residence, Lower Allen Township, near Eberly's Mills; farmer. Moved to present residence March, 1875. In May, 1875, visited Drawbaugh's shop and saw a number of talking machines there. Identifies "B" and "F," and thinks he also saw there at that time "A" and "C." Drawbaugh then and there talked to him through instruments not clearly identified, from one floor of the shop to another. Drawbaugh sang to him through the instruments, "Old Folks at Home;" witness distinctly understanding both the tune and the words. Understood also other words which he does not now remember. Could distinguish the voice of the speaker. Drawbaugh at the time explained the principle of the talking machine to witness, and told him that he thought it would take the place of telegraphing, and that "he thought he could make it that he could talk through it to Harrisburg." Witness further testifies to the continuous work on Drawbaugh's talking machine from the date of that visit up to the date of his deposition.

HIERONYMOUS GEISTWEIT *(D. Vol. 1, p. 457)*:

Age, fifty-five; New Cumberland; engineer. Heard Drawbaugh talk through "B" and "F," in July, 1870 and 1871. Witness testifies that his visit to Drawbaugh's shop was made in 1870 for the purpose of procuring a ratchet-drill to use in making some repairs on a mill in New Cumberland, where he was then employed. Complainants' witness, Henry R. Musser, by his book entries, fixes the time when these rapairs were made as a year later — 1871. *(See Complts. Vol. 1, p. 372, Ans. 26, et seq.)* Witness listened at "B." Drawbaugh talked into "F," the instruments being in different parts of the building and being connected by small wires and wrapped with colored threads. Drawbaugh spoke some few words through the talking machine, and "then holloed out whether" witness heard them. Witness replied that he did quite "plain and distinct," and now testifies that that was the fact.

GEORGE FREE:

(*D. Vol. I, p. 484*): Age, 41; white. Hill, Cumberland County. Cattle dealer. Was at Drawbaugh's shop on or about June 21st, 1875, during haymaking of that year, with John A. Eyster (*see Eyster, D. Vol. 1, p. 490*), and heard Drawbaugh talking through the talking machines. Listened at "A" in the cellar while Drawbaugh talked from two floors above. Heard and understood distinctly. Remembers that Drawbaugh sang Yankee Doodle, and spoke other words, and asked questions through the machines. Witness understood what was said and plainly distinguished the voice as that of Drawbaugh. "A" was connected by two wires with the transmitting instrument, which was also connected by two wires with a battery. The testimony of this witness is also valuable as showing the continuous work of Drawbaugh on the talking machine, and his effort to improve it so as to make it talk up distinctly into the room so as to be heard at a distance.

DANIEL FETTROW:

(*D. Vol. 1, p. 347.*) Age, 51; residence, Eberly's Mills; blacksmith; did smithing for the axle company, composed of Baer, Kline, Grove and Moore, the first of which appeared by his book entries to have been done March 26, 1875, (see also Defendant's Exhibits, p.——) his account extending to September, 1876. The co-partnership known as the Axle Company was formed December 23, 1874, (*Moore, D. Vol. 1, p. 416, Ans. 3*), and was dissolved February 29, 1876. (*Id., Ans. 4.*) The business, however, being continued on a reduced scale, first by Moore and Grove, and subsequently by Moore alone for a short time longer, the last axles, with the exception of a few for exhibition at the Centennial, being made in April, 1876. The machinery of the company was put into the shop known throughout this case as Drawbaugh's shop, during the latter part of March, 1875. (*Id., pp. 616-617, Ansrs. 15, 16.*)

The testimony of the witness Fettrow is so striking, and in many respects important, that a portion of it is here given at length. He says:

Q. 16—State how he come to show you the talking machines the first time you saw them?

A.—The time that Baer was starting this axle machinery, Drawbaugh was rather counted as the head man of getting up the machinery; that is, putting up the shafts, and Drawbaugh came to me and told me to come down to the shop, to show me to make some levers, and I went down. After he had showed me how they were to be made, and I was just in the act of leaving the shop, he said to me, "Oh, Daniel! see here," and he went on ahead, around in another apartment of the shop; then he showed me this machine, which was then called the talking machine amongst us at home there. Then he showed me how to hold it to my mouth and to my ear, and then he went around into another room, and then he spelled Harrisburg; after he was done with that he sang notes. Then I said into this machine, "All right;" then he came back to me.

Q. 17—Did you distinctly hear and understand him when he was spelling and singing into the machine?

A.—Yes, sir.

Q. 17½—When he came back to you, did he say whether he heard you, when you said, "All right" into the machine?

A.—Yes, sir; he did.

Q. 18—Please look at the machines now shown you, marked "A," "B," "C," "D," "E," "F," "G," "H," "I," "J," "K," "L," "M," "N," "O," and see if you find the machines by which you and Mr. Drawbaugh talked to each other at that time, as you have testified?

A.—Figures were not mentioned at that time, but there was a curl on like that (taking up "D"). I would not just positively say that is the one, but it was just like that. Now, here is one (taking up "E"), that when you take the lid off is just the same way, so that I could not positively say.

Q. 19—Do you remember whether the instrument Mr.

Drawbaugh talked into was like the one you listened at, or did you see the instrument he talked into?

A.—No, sir; I did not see that one.

Q. 20—I understand you that you used the same instrument to listen at and to speak into. Am I correct?

A.—Yes, sir.

Q. 21—How did the size of that instrument compare with the size of this instrument "D"?

A.—As near as I can tell, it was the same size. It had a mouth-piece the same as that.

Q. 22—State what conversation you and Mr. Drawbaugh had about the talking machine at that time.

A.—After he had talked to me through the machine, he came back to where I was, and he said that this would go ahead of telegraphing. He said then that if I would want to telegraph to anybody, I would have to pay so much a word, and with this machine (meaning the speaking machine, as we called it then), I could, for five, six, eight or ten cents, speak myself to the man or person that I would want to speak to myself, and it would be cheaper than telegraphing.

Q. 23—Was anything said at that time about how far you could speak with this machine?

A.—Yes, sir; he said I could speak ten, fifteen, or twenty miles, or even to California, if there was a wire extended.

Q. 24—Was anything said at that time about patenting the invention? If so, what?

A.—Yes, sir; I asked him whether he had a patent, and he said not. He said he had not the money, but he said he had talked to a couple of men to go in with him and get it patented."

Although this appears to have been the first time the witness ever saw a talking machine, he had known of it, through report, in the neighborhood before, and had heard people call it "tom-foolery," (Ansrs. 26–27), at about the same time witness saw instruments "B," "F," "I" and "A," and subsequently, from time to time, other talking machines.

The testimony of this witness is further very important, showing the poverty of Drawbaugh, and his continuous work on the talking machine.

DAVID STEPHENSON, JR.

(*Add. proofs, p. 141*). Age, fifty; Mechanicsburg; machinist. In the argument at New York complainant's counsel laid great stress on the fact that this witness was not called to testify in this case, inasmuch as according to the statement there made, that if there had been a telephone at Drawbaugh's shop witness must have known of it. When further testimony came to be taken in the Overland case, Stephenson was called, and the reason why he was not produced in the People's case was shown to be because he had difficulty in fixing dates. He had, however, informed John C. Comfort, the confidential agent of complainant's counsel, long prior to the New York argument, that he had knowledge of the subject, but could not fix dates positively. The bad faith of the comments (*given at large Add. proofs, p. 142*) made by complainant's counsel upon the absence of his testimony, is therefore apparent.

He testifies that his first knowledge of Drawbaugh's talking machine was when the latter still lived and had his shop in the old house behind the grist-mill. (He moved out of it into a house which he purchased upon the hill, in the spring of 1868 (*D. Drawbaugh, D. Vol. 3, p 842*).

and moved his shop down to the clover mill at the creek some time earlier. (*Id. 750, 873.*)

Drawbaugh then and there showed it to him and talked to him through it, Drawbaugh speaking in one room and witness listening in another, and the instruments being connected by wires—more than one wire—which ran zigzag from post to post along the porch, for the purpose of increasing the length of the circuit. Witness heard the sound faintly through the instruments, and seems to have understood words, although he cannot remember any of them. He also positively established the fact of having been at Drawbaugh's shop in the fall of 1874.

This witness also positively establishes the fact of being at Drawbaugh's shop with his daughters, Alice and Florence, in the chestnut season, prior to September 1, 1875; that is, not later than the month of November, 1874. The dates are fixed absolutely by his rent receipts and vouchers, showing where the witness was living, to wit, at the corner of Third and Chestnut streets, Harrisburg, at the time of this latter visit. While at Drawbaugh's shop on this occasion, the telephones were exhibited to him and his daughters, and Mr. Drawbaugh and the witness talked to each other through them from first story of the clover-mill shop to the basement, and heard and understood perfectly well the transmission of speech through them. Mr. Stevenson's daughters, Alice and Florence, corroborate the testimony of their father of this latter visit in every particular, and render it absolutely unanswerable. They fix the time of the visit as being in the chestnut season, while they were living at the house corner of Third and Chestnut streets, Harrisburg, by a circumstance which is absolutely conclusive, to wit: that on their return home that evening, they were conveyed across the railroad bridge over the

Susquehanna River upon a shifting engine, which the engineer stopped at the corner of Chestnut street, the block in which their house is situated, in order to let them off at the point nearest their home; this, they say, being the only time they rode on a railroad locomotive.

ORLANDO B. KAHNEY (*D. S. Reb., p. 224*):

One of complainants' negative witnesses (*see Complainants' Vol. II, p. 990*), who had previously testified that although he lived at or near Eberly's Mills from 1871 to 1879, he had no knowledge of Drawbaugh's talking machine until the fall of 1876, testifies that he was at Drawbaugh's shop in July, 1875, before the oats harvest of that year, and then and there saw and heard Drawbaugh talk through his talking machine. Understood what was said through the instruments. He was accompanied to the shop on this occasion by Milton Basehore, who was working with him at the time for Wilson P. Walters, and they went there for the purpose of grinding scythes to be used for cutting oats. It appears by the books of Walters (*D. S. Reb., p. 121*) that Orlando Kahney never worked for him after September 11, 1875. Witness is corroborated by Basehore (*D. S. Reb., p. 116*), who testifies with regard to the visit, fixing its date, and to the fact of seeing Kahney in the act of listening at the talking machine.

A striking circumstance may be here mentioned that the witness Kahney, after having testified for complainant, recalled the fact of this visit and his seeing talking machines then and there, and endeavored to induce complainants to allow him to come back upon the stand and correct his former testimony, but without success.

DANIEL RUPP (*D. Vol. 1, p. 427*):

Age 48; Spring Garden, Lancaster County; coachmaker. Drawbaugh talked through machine to witness in 1874. (Date fixed by building of house.) Witness listened at "A" and understood what Drawbaugh said. Repeated the language which he heard through the machine to Drawbaugh, who informed him that it was correct. He remembers that the names of the cities of Pennsylvania were spoken through the machine Instruments were connected by copper wire covered with silk or cotton, and Drawbaugh told him that his invention would take the place of telegraphing.

DR. GEORGE W. BOWMAN (*Add. Proofs, p. 173; recalled, p. 179*):

Age, forty-two; Mechanicsburg; dentist. Testifies that he was at Drawbaugh's shop prior to May, 1871, and saw and heard Drawbaugh talk through the talking machine. The circumstances which he relates and which are corroborated by the testimony of his wife, Mrs. Maggie E. Bowman (*Add. Proofs, p. 177*), fixed the date of the visit beyond all question. He testifies that Drawbaugh talked on the third floor, if his memory serves him right, and that he, witness, listened down in the basement. The instruments used are not identified, but witness remembers that they were connected by a wire of wires that hung loose, and he also remembers some of the words which he heard through them. His wife was at Drawbaugh's shop with him on that occasion, but remained in the buggy, and did not see the talking machines. She, however, corroborates him by testifying that when he came out of the shop he told her what had occurred, and she fixes the date with great positiveness that the visit was before her mother's death, which occurred March 14, 1871; Dr. Bowman and his wife having gone to Eberly's Mills at the persuasion of Mrs. Bowman's mother to attend a baptism.

HENRY B. MUSSER:

(D. Vol. 1, p. 315): Age 41; residence, Camp Hill; farmer. Went to Drawbaugh's shop June 27, 1874. (Date fixed by book entry, (*Ans. 8*), to have a reaper fixed, and whilst there Drawbaugh showed and talked to him through " B " and " F." " B " used as receiver. (Ans. 86.) Heard and understood. Drawbaugh then explained to him the principle of the talking machine, telling him it was operated by electricity, and spoke to him of high and low conductors. Ans. 19: " He showed me " there something that he had — low conductor and high " conductor; and two things flattened together, using his " hands with the palms together, to show me (thus), and " called it a low conductor; and the one raised, a high con- " ductor. I understood it in that way; he explained it in " that way to me, but I could not understand it." (The witness, in illustration, in the course of his answer, presses the palms of his hands together.)

Witness again visited Drawbaugh's shop June 28, 1876 (see Moore, D. Vol. 1, p. 623, Ans. 33), to have some repairs made to his mowing machine. He then saw " D " and " E," and Drawbaugh talked through them to him. Witness heard and understood what was said through the instrument.

WILLIAM SENSEMAN (*D. vol. 1, p. 640*):

Age, 43; residence, Boiling Springs, Cumberland County. Dealer in horses. Lived at Eberly's Mills from April, 1872, to April, 1873. Has never been at Drawbaugh's shop since the latter date. During the period mentioned, Drawbaugh showed him talking machines, and talked through them to him from the second floor of the shop to the basement. Wiiness could hear and understand some of the words. Does not name the instrument used for the talking, but identifies "B," "F," "C" and "I," as seen by him at Drawbaugh's shop.

JAMES BROOKS (*D. Vol. 1, p. 41*):

Age, sixty-eight; residence, Shiremanstown; present postmaster; millwright. Was at Drawbaugh's shop between December 16, 1873, and March 31, 1874 (which dates he fixes by certain work he did upon the grist mill at Eberly's Mills), and then and there heard conversation through "B" and "F," between the third floor and the cellar in the shop. Instruments were connected by two wrapped wires. Heard and understood distinctly and recognized the peculiarity of the voice of the speaker. Drawbaugh told him at the time that the machines were operated by electricity.

JACOB B. FRY.

(*D. Vol. 1, p. 98.*) Age, twenty; residence, Shiremanstown; occupation, laborer; lived at Eberly's Mills from last of March or April 1, 1873. (*See, also, Jeremiah Fry, Id. p. 143.*) First saw talking machines at Drawbaugh's shop, in May or June, after moving there. Identifies "D" and "E," remembering particularly the curled magnets on them. Heard Daniel Drawbaugh talk through the machines at that time, although he cannot state positively that "D" and "E" were the ones used. Heard Drawbaugh at that time say through the speaking machines that "Harrisburg was situated on the banks of the Susquehanna River." Those words he heard plainly and distinctly.

He also testifies to seeing other talking machines there at various times from 1875 to 1879, and to the fact that

Drawbaugh was at work, making improvements, from time to time during that period.

IRA D. KAHNEY.

(*D. Vol. 1, p. 201*): Age, 32; residence, Camp Hill; occupation, boss in a stone quarry. "Between 1871 and 1872" heard Daniel Drawbaugh talk through "B" and "F" from the upper part of the shop to the lower—Drawbaugh talking into "F," and witness listening at "B." Heard and understood distinctly. "Between 1873 and 1874," heard Drawbaugh again talk through talking machines from upper to lower part of shop, witness listening at "A." Heard and understood what was said, and could tell that it was Daniel Drawbaugh speaking. Witness also identifies other instruments seen at subsequent times, and testifies to Drawbaugh's desire to patent his invention, and to circumstances showing its electrical character.

WASHINGTON SUTTON (D. vol. 2, p. 1,103): Age, sixty-one; Lewisbury, York County; blacksmith by trade. Was at Drawbaugh's shop in August, 1873, which date he fixes by the date of a sale note (Ansrs. 3 and 4). At this visit he talked machines, and heard Drawbaugh talk through them. Is corroborated as to his date and statement by Rankin B. Sutton (D. vol. 2, p. 1,108).

JESSE EICHOLTZ.

(*D. S. Reb., p. 152; recalled, p. 160*). Age, 47; residence, Grantville, Dauphin County. Present occupation, carpenter. Formerly miller. Formerly lived at Oyster's Mill, on the Conodoguinet Creek, in Cumberland County, three miles or more from Eberly's Mills. First saw talking machines in summer of 1871, when he visited Drawbaugh's shop for the purpose of seeing them, having previously been told about them by Drawbaugh and invited by him to go and see them. Drawbaugh then talked through them to witness, who heard and understood distinctly what was said. Was again at Drawbaugh's shop November 6th, 1873 (which date he fixes by book accounts), in company with his wife. Drawbaugh then showed them his talking machine, and talked through it to them from the upper floor of the shop to the basement. Witness understood plainly what was said and remembers some of the words spoken. He testifies that when Drawbaugh first spoke through the machines to them on this occasion the shop was quiet; but that in order to illustrate further the capabilities of his invention, he started the machinery of the shop, and they still heard what he said through the machines. Witness does not positively identify the machine at which he listened and talked on the occasion of the second visit, but thinks he saw both "C" and "I" there at that time. He listened and talked at the same machine. He says: "(Drawbaugh) said he "would start the wheels now and go up and talk to us "again, and that we should listen and would still hear him. "I remember one word yet that he spoke to me. He "asked us, just as he was going to quit, 'Do you understand "me,' and I said, 'Yes;' then he came down and said, 'I "understood you, and you understood me.' I don't "remember what else he talked to us, but I mind that."

His date of November 6, 1873, has been attacked by complainants, because he testified that John Tehl rode along with him on "that day from Tehl's mill, where he was milling at that time," it having been shown by complainants (*Etter, Complts. Vol. 3, p. 274*) that Tehl had ceased living there some time before that date. But the statement of the witness that Tehl was milling there at that time is of no special consequence and cannot fairly be used to shake his date, a reasonable explanation being that Tehl happened to be at the mill on that day and rode with witness, who, residing at some distance from there, and knowing of Tehl's former connection with the mill, may not have been informed of any change; or if he knew it at the time, may have forgotten it when testifying. Witness is corroborated by his wife, Melinda M. Eicholtz (*D. S. Reb. p. 158*), in every particular as to his visit of November 6, 1873, and what took place then. She also testifies that she was never at Drawbaugh's shop, except on this occasion.

ABRAHAM MAY (*D. S. Reb., p. 1,028*).

Age, forty-seven. Residence, Centre Township, Perry County, Pennsylvania. Now farmer; formerly carpenter and builder. Worked at repairs on house of Daniel Hart, at Eberly's Mills, from August 22, to September 18, 1870 (dates fixed by account book produced), and during the progress of this work had occasion to go to Drawbaugh's shop to have a boring machine repaired. Then and there saw and heard Drawbaugh talk through his talking machine from up stairs to the basement. Heard and understood the words which were spoken.

BENJAMIN R. GOODYEAR.

(*D. S. Reb., p. 1,011.*) Age, forty-seven; Carlisle; lawyer. Formerly deputy sheriff. Whilst deputy sheriff in 1871, he made a levy under a writ of execution against George W. Kissenger, and on the 4th of December, 1871, held an appraisement of goods under the exemption laws. Upon that occasion he went to Drawbaugh's shop to summon John B. Drawbaugh as an appraiser, and then and there saw and heard Daniel Drawbaugh talk through the talking machine from floor to floor. Understood distinctly. The date is fixed by the certified copy of the record, which is offered in evidence, with depositions of this witness. So far as he can recollect, witness has never been at Drawbaugh's shop since.

WILLIAM H. MARTIN (*D. S. Reb. p. 827*): Age, thirty-five; near Pittsburgh, Pennsylvania; carpenter; resided in Cumberland County until April 1, 1876; went to Milltown or Eberly's Mills, in company with John Keefauver, to get George Hosler to make him a pair of boots whilst Hosler was living there. Hosler lived at Eberly's Mills only from March 5, 1872, to March 25, 1873. (*D. S. Reb., p. 368.*) Witness and Keefauver then and there talked through Drawbaugh's talking machine from the basement to the attic, using the same machine for both talking and listening. Understood what was spoken, and carried on conversation through the machines. Witness had, however, heard of Drawbaugh's talking machine long previous to this, to wit: 1869, 1870.

JOHN F. KEEFAUVER (*D. S. Reb., p. 837*):

Age, forty-one; Harrisburg; grocer. Corroborates Martin in every particular as to his visit to Drawbaugh's shop while Hosler lived at Eberly's Mills, and seeing and talking through the talking machines. Talked both ways and carried on conversation through them.

This witness also, on another occasion, talked through the talking machines from cellar to attic in Drawbaugh's shop when he was there in company with Jacob M. Sadler, now dead. Talked both ways and understood, and was able to carry on a conversation through the machines. The latest possible date of this visit is fixed by the fact that witness on this occasion went to Eberly's Mills to see George B. Heck, who died in July, 1873. (*See John B. Heck, D. S. Reb., p. 893, Ans. 10.*)

JEREMIAH KOHLER.

(D. Vol. 1, p. 543.) Age, 45; Bridgeport, Cumberland County. Miller. Lived at Eberly's Mills April, 1873, to April, 1874. (See, also, W. N. Miller, Id. p. 643, Ans. 5–10.) During that time Drawbaugh talked with him several times from floor to floor, through machines which are not identified, but which were connected with wires and a battery, and which witness understood were operated by electricity. Witness heard and understood what was spoken through the machines. He also identifies "B," "C," and "F" as machines seen by him at Drawbaugh's shop, during the period mentioned, and testified that he saw Drawbaugh making "A."

JOHN J. ZACHARIAS (*D. vol. I, p. 47*):

Age, forty-one; residence, Siddonsburg, York County, Pa.; miller. Testifies that he was at Drawbaugh's shop to get a mill-tram, between 1870 and 1874, the date of his visit, however, being fixed by Joseph B. Stretch (*D. vol. 1, p. 60*), by book account made at the time as in July, 1869, and never got but one tram. Saw "B" and "F," and heard Drawbaugh talk through them. Heard and understood what was said, and understood Drawbaugh's voice distinctly and recognized it. Sound was as loud as though a speaker was speaking in an undertone, and not so harsh as in ordinary conversation. Drawbaugh told him, at that time, that he could talk for miles and that his invention would eventually take the place of telegraphs. The machines were connected by wrapped wire.

GEORGE FRESSE (D. vol. 1, p. 132):

Age, sixty-two; residence, Shiremanstown; tailor; formerly burgess of Shiremanstown. Was at Drawbaugh's shop September 17, 1869. (Date fixed by book entry of Henry Yetter, Id. 135–6), to collect a small bill which Drawbaugh owed him for tailoring. At that time Drawbaugh showed him and talked to him through his talking machine. Witness heard distinctly. Identifies "B."

HENRY BAYLOR *(D. Vol. 1, p. 150)*:

Age, sixty-two; residence, York, Pa.; retired merchant. Was engaged in the lumber business from April, 1873, until the last of 1876 or beginning of 1877. First visited Drawbaugh's shop in June, 1873. This date is corroborated by the fact which witness testifies (Ans. 28) that he was after the faucet interest, and that he ascertained that it had been sold to a Mechanicsburg party after his visit to Drawbaugh's shop on that business. The faucet interest was sold to the Haucks, of Mechanicsburg, July 1, 1873, and possession given July 15, 1873. *(See Gorgas Vol. 1, p. 653, Ans. 30; and D. A. Hauck, Complts. Vol. 1, p. 789, Ans. 16–17.)* Witness testifies that Drawbaugh showed him his talking machine and talked through it to him at this time. Although witness cannot recall any words that were transmitted, he testifies that he could "plainly distinguish his" (Drawbaugh's) "voice," and that the latter talked to him in different tones of voice, witness hearing him even when "a very low voice" was used. Witness was much impressed with the invention, and upon receiving an offer from Drawbaugh of a half interest in it, if he would advance means to procure a patent upon it, seriously considered the matter, and "was almost induced to risk a few hundred dollars, and would have done so," had it not been for the fact that he was about that time greatly worried about some of his business affairs.

SAMUEL NICHOLS (*D. Vol. 1, p. 227*):

Age, 51; residence, White Hill, Cumberland County, Pennsylvania; civil engineer; heard Drawbaugh talk through "B" and "F," in the summer of 1870; Drawbaugh talking into "F," and witness listening at "B." Witness distinguished Drawbaugh's voice very plainly and understood all that was spoken through the machines. "B" and "F" were connected by two wires and located in different rooms.

This witness testified, that upon the occasion referred to, Samuel Bruce, his son-in-law, was along with him, and that there were others present whom he does not recollect. Complainants attempt to attack his date by showing that Bruce did not become his son-in-law until June 10, 1876 (see Spees, Complts. Vol. 2, p. 925). But it will be observed that witness does not testify that Bruce was his son-in-law at the time of the visit, but probably speaks of him in that relation, merely, for the purpose of identification. A weak attempt was also made by complainants to show by the testimony of witness' son, Edward Nichols (Complts. Vol. 2, p. 858), that witness could not have been well acquainted with Bruce as early as 1870, but in this they completely failed (see Edward Nichols, *Id.* p. 881, Cross-Ansrs. 256, 257).

JOHN SCHERICH:

(*D. Vol. 1, p. 176*): Age, 69; residence, Mechanicsburg; insurance agent; lived at Camp Hill, about a mile and a half from Eberly's Mills, from April 1, 1873, until April 1, 1875. Was at Drawbaugh's shop about four years prior to moving to Camp Hill, and saw "B" and "F," through which Drawbaugh talked to him from the basement to the third story of the shop. Witness listened at "B" and heard what Drawbaugh said. Whilst living at Camp Hill, and in the fall of the year, witness went to Drawbaugh's shop to make cider, (cider-mill sold by Drawbaugh to Hake in the summer or fall of 1875. See Drawbaugh, D. Vol. 2, p. 888, Ans. 759, and was in use at Hake's Mill in 1876. See Emminger, Complts. Vol. 2, p. 935.) That it was in use at Drawbaugh's shop as early as 1874. (See John Kahney, Complts. Vol. 3, p. 2,054, Ans. 180; p. 2,041, Ans. 62), and this was the last time witness was in Drawbaugh's shop. He then and there saw instrument "A," and heard Drawbaugh talk through the talking machines, witness listening at "A" on the third floor, and Drawbaugh talking in the basement in an instrument which resembled "I."

WILSON G. FOX, late Chief of Police of Harrisburg, Pa. (*D. S. Reb. 342-7*), saw the talking machine in Drawbaugh's shop in 1867 or 1868, when the old Faucet Company was in operation there. Prior to March, 1871, witness was employed in the carding room of the Harrisburg Cotton Mill, and Drawbaugh came there to get cotton to wrap his wire, which he intended to use for the talking machine.

JACOB BARBER (*Id. 371-7*) was a candidate for the office of County Commissioner of Cumberland County in the summer of 1873, and, in connection with that political campaign, had occasion to go to Drawbaugh's shop shortly after the death of Geo. B. Heck. While at Drawbaugh's shop saw the talking machine there. *Was never at the shop after July or the beginning of August, 1873.*

ABRAHAM MARQUART, Justice of the Peace and one of the most prominent citizens of Newville, Cumberland Co., formerly an insurance agent, gives testimony of the most conclusive character as to the existence of Drawbaugh's telephones (*Exhibits "D" and "E"*) as early as March, 1875. The witness was never at Drawbaugh's shop after that time, and the date is absolutely fixed by a business transaction which took him there and of which he made a record in his insurance book at the time. (*Add. proofs, p. 113*).

WILSON H. STRICKLER, (*Add. proofs, p. 233*), gives testimony of the most singularly conclusive character. He is a stock-raiser from Ford County, Kansas, and arrived in Pennsylvania on the 12th day of March, 1885, before he gave his testimony. He had formerly lived at Harrisburg, Pa., and he testified that he never was in Milltown (Eberly's Mill's), Cumberland Co., Pa., but once, and that he then made the acquaintance of Daniel Drawbaugh; that he had never seen him since the day he first made his acquintance, nor since he arrived from Kansas to give his testimony. He relates that he visited a friend near Milltown, and told him of a process he was then preparing to insulate telegraph wires with mica, and that he was desirous of ascertaining how insulated wire was covered with webbing, so as to know whether the ordinary process of covering with webbing would be a suitable means to enable him to insulate with mica. His friend took him to Daniel Drawbaugh. He had not then patented his conception, but was preparing to do so, and afterwards applied for it, and produced a patent bearing date April 20, 1875. The specifications and drawings were produced, showing that the specifications were filed August 22, 1874. He swears positively that he had not filed an application, and was not prepared to file an application at the time he visited Drawbaugh, and he names Mr. Geo. Free (a witness here, *supra*), as the friend who took him to Drawbaugh and introduced him on a Sunday morning; that Drawbaugh then and there showed him the mode practiced by him in insulating by wrapping it with insulated material, and showed him the several machines that he (Drawbaugh) had for covering wire. He then goes on to describe the talking machine which Drawbaugh showed him and explained how electricity operated it. He showed him the large horse-shoe magnet which he then was using; remembers the machines, and says that he understood and talked through them. He says that Drawbaugh talked, and that he, the witness, answered back over the wire; that Drawbaugh was not in the same room, but in another room. He remembers distinctly the "two spools" which were coiled with fine insulated wire (electro-magnet), and that these two spools were at the end of the horse-shoe magnet.

This witness then went *with the Examiner* to the room where the exhibits were, looked at the exhibits there in charge of the Examiner; looked at all the instruments in this case, and selected the instrument known as "C," and returned to the examining room with it.

This witness had formerly been the agent for the Society for the Prevention of Cruelty to Animals at Harrisburg; also had been Yardmaster at the Harrisburg Stock Yards.

William W. Snyder (*D. S. Reb., pp. 1,066–82*) was at Drawbaugh's shop Wednesday, February 5, 1873, and saw the talking machines. Witness fixes the date by an entry in his diary.

ABRAHAM DITTLOW (*D. S. Reb., p. 376*):

This was one of complainants' negative witnesses (*See Complts. vol. 2, p. 967*), who, under the skillful manipulation of his memory by complainant's agents, knew nothing of the talking machine until the spring of 1876, but he, himself, upon reflection, was able to remember having seen and heard talking through a talking machine in 1874, which date he fixes by the circumstance of his preparing a trapping kit at Drawbaugh's shop at that time. Witness listened whilst Drawbaugh talked from floor to floor, and understood "well enough" what was said through the machine, although at the time he, in order to plague Drawbaugh, told him that he did not understand. Alexander Hillner (*D. S. Reb., p. 512*) corroborates witness, testifying that witness told him about circumstances above related in the spring of 1876, in Indiana, and C. B. Clifford (*D. S. Reb., p. 515*) testifies to the same effect.

Without continuing an extended analysis we refer briefly, in addition to the foregoing, and in addition to the witnesses discussed and quoted under A DISCUSSION OF THE HISTORY, CONCEPTION AND INVENTION, CAPTION V, to the following equally strong and positive testimony:

Henry Yetter, keeper of the tavern at Milltown and butcher. (*D. I. 138.*)

David B. Carl, butcher and farmer. (*Id. 157–65.*)

Jacob S. Schopp, farmer and stock-grower. (*Id. 389–92.*)

Henry Bonholtzer, blacksmith. (*Id. 384–7.*)

Harmon K. Drawbaugh, teacher, of Harrisburg. (*Id., p. 550.*)

John B. Drawbaugh, machinist, and brother of Daniel. (*Id., p. 575.*)

Geo. W. Drawbaugh, son of John B., machinist (*Id. p. 597*).

John H. Stephen (*Id. p. 597*): Farmer. His dates are corroborated by Henry Ostot (*D. S. Reb., p. 361*), and fixes as the time 1870–71. Ostot was never in the shop after 1873, and was there with Stephen.

Peter Z. Zimmerman, wheelwright (*Id. p. 414*).

Elias Z. Good, miller and fence-maker. Saw the machines in 1872, before he moved away from Milltown on April 1, 1872 (*Id. p. 198*).

Jacob Hawn, blacksmith, fixes date as prior to May 27, 1872, when he moved away from Milltown. (*Id. p. 266*.)

John C. Smith, machinist (*Id. p. 334*).

Henry F. Drawbaugh, superintendent of the lumber yards at Newville (*Id. p. 396*).

Jacob E. Shettel, formerly member of Clock Company. Commented on as man of means and character by complainants. (Id. p. 206.)

Rufus K. Shireman, painter. (Id. p. 259.)

Dr. John W. Moffit, Harrisburg. (Id. p. 494.)

Henry N. Shoop, carpenter. (Id. p. 255.)

Jacob B. Smith, laborer. Saw the machines on his wedding trip in 1871. (Id. p. 165.)

Daniel C. Jones, clerk in the hat business at Harrisburg. Had not been at Drawbaugh's shop since 1871; saw the machines then. (Id. p. 503.)

Daniel B. Smyser, farmer. Saw the machines before his wife died; she died January 24, 1874. (Id. p. 607.)

Urias R. Nichols. (Id. p. 89.)

Jonathan Balsley, blacksmith. Fixes the date by the death of his wife. (Id. p. 107.)

Daniel B. Condry, miller. (Id. p. 138.)

William Epply, farmer. (Id. p. 280.)

John A. Oyster, farmer. (Id. p. 490.)

John F. Rupp, florist. (Id. p. 311.)

REFERRING TO VOL. II, DEFENDANTS' EVIDENCE.

Henry Herr, farmer. (D. Vol. 2, p. 667.)

N. N. Hubler, foreman builder at the Harrisburg Car Works. Was teaching school for four months, once a week, in the fall of 1873, at Milltown. (Id. 691.)

John Wolf; 75 years of age; retired farmer. (Id. p. 673.)

John H. Smith; cordwainer. Was with Dr. Updegraff. (Id. p. 1,093.)

Thomas Updegrove. With Updegraff in the spring of 1874. (Id. p. 1,098.)

REFERRING TO SUR-REBUTTING EVIDENCE.

George Hosler, shoemaker and Supervisor of the Roads. (D. S. Reb. p. 367.)

Jacob R. Vanansdale, steam thresher and agent for Hawk & Comstock's machinery, testifies to having seen "F" and "B," February 3, 1875, at the shop. Never was there after that. Fixes time by book entry and explosion of Wilson's store. (Id. p. 788.)

Jacob F. Emsinger. Corroborates Vanansdale, who was with him at the time. Railroad man on the Northern Central Railway. (Id. p. 808.)

Andrew and Mary Evans. Saw machines in December, 1875. (Id. pp. 1-61.)

CHARLES F. STEINBERGER:

Miller; now living in Perry County. Never was in Drawbaugh's shop since he moved away in 1871, in October. He identifies Exhibits "F," "B," "C" and "I" as having been seen by him in the shop in 1871. He never again saw the instruments " C " and " I " until the day when he gave his deposition, and " C " until he was actually on the stand. Just before he went on the stand defendant's counsel showed him some of Drawbaugh's old talking machines, but not " I." The witness told him there was one more and asked to see it, and described it so clearly that Exhibit " I," from his description, was brought. (*D. I., p. 344.*)

Jacob S. Shoop. (*Id. p. 387–92.*)

HENRY OSTOT: Was never in Drawbaugh's shop but twice; first time in 1870 or 1871, and the last time being on the day of the public sale of the effects of Geo. B. Heck, deceased. That sale is fixed by the papers at September 13, 1873 (John B. Heck, D. S. Reb., 892–3). Ostot saw the talking machines on his first visit to Drawbaugh's shop, but does not remember seeing any on his last visit. He identifies " C." (Id. p. 360–4.)

MRS. EICKHOLTZ: Was with her husband, Jesse Eickholtz, at the shop, November 6, 1873; never at the shop since. Corroborates her husband's account of the visit and of talking through the machines, in every particular. She had also heard they were Drawbaugh's talking machines before her husband went down to see it in 1870 and 1871 (Id. p. 151–8–60).

GEORGE B. EYSTER, sheriff of Cumberland County, corroborates Eickholtz' testimony. He was Eickholtz' partner and was told of the visit to Drawbaugh's shop at the time. (Id. p. 890–1).

E. B. HOFFMAN. (Recalled, Id., p. 660.) Identifies the time as of the time of the great flood. Complainants made an effort to break Hoffman's date of August, 1873, but utterly failed. (See Appendix D of closing brief, and D. vol. I, 481–4).

GEORGE L. HALE. (Id. p. 472.) Tinner and coppersmith. (Id. p. 472-7). Recalled, p. 694. Describes magnet and its position in "C" at the time of his visit in the fall of 1873. Describes the wires as covered with green wound around spools (electro-magnet), and that spools were arranged between the diaphragm and the permanent magnet.

RANKIN B. SUTTON *(D. Vol. II, p. 1,108-9):* Testifies that when Washington Sutton (*supra*) returned home from Drawbaugh's shop, in 1873, he told him of the talking machine, and says: "I heard Drawbaugh speak of them." The date is fixed by the testimony as immediately after the sale of the machinery to the Hecks, in July, 1873, and confirms the date of August, 1873, as fixed by the recollection of both the Suttons. Washington Sutton was never at Drawbaugh's shop after that. *(W. Sutton, Ans. 1.)*

WILLIAM F. LENIG: Machinist, at the Harrisburg Car Works. Saw the machines with Hubler when Hubler was teaching school at Milltown. Remembers the horseshoe magnet upon it. *(D. 2, pp. 698-9.)*

DAVID SPANGLER: Farmer and marketman. Lived on the Studebaker farm about March, 1875; was once at Drawbaugh's shop in 1874. Has since lived at Shiremanstown. *(S. Reb., pp. 454, 462.)*

THOMAS DRAPER, a prominent business man of Dover, Delaware, testifies, that he was at Drawbaugh's shop in 1874, for the purpose of ordering an hydraulic ram for his tenant Kissinger. He then saw and talked through instrument "C" and "I;" distinctly understood and heard what was said. Defendants didn't know of his information about talking machines until after the complainants had interviewed him and first got the facts. His testimony is before referred to under another head, and it is as to this witness that the dates were attacked in the ram controversy. (See Appendix " A " at the end of closing brief, and D. II, p. 1,123–35.)

William H. Bates, blacksmith, from Mountjoy, Lancaster Co. (D. I, p. 419–26.)

John Weber, farmer, was in shop of Drawbaugh December, 1874. Never been there since January, 1875. (D. I, p. 244.)

Andrew Evans, house painter, fixes the date with absolute certainty by the loss of his leg and employment for Mr. Baer, as the fall of 1874. (D. I. p. 62.)

Henry M. Darr. (Id. p. 272–5.)

Mary A. Evans. (D. S. Reb. p. 61–74, 55–60).

Jeremiah Fry. Tobacco farming and merchant. (D. I. p. 143.) Identifies " A," " D," and " E" as of April 9, 1875. (D. I. p. 143.)

Elias Graybill. Saw " D" and " E" before December, 1875. (D. S. Reb. p. 184, 206.)

Daniel A. Hammacher. School teacher. Was at the Drawbaugh shop with his scholars on Feb. 1, 1876. (D. S. Reb. p. 289, 312.)

Augustus Kahney. Day laborer. (D. S. Reb. p. 254.)

Michael Konn. A laborer. (D. I. p. 129.)

Robert McCleaf. Miller. Never was in shop but once, nor since the blowing up of Wilson's store on Jan. 19, 1875. (D. S. Reb. p. 815.)

Jacob M. Peterman. Laborer on Pennsylvania R. R. (D. S. Reb. p. 471–6).

John F. Rupp: Was a pupil with D. A. Marquart on his visit to shop, February 1, 1876. (D. I. pp. 311, 314.)

John Simmons: Was at the shop with Jacob Evans in November, 1875, and saw the talking machines. (D. S. Reb. p. 427.)

John M. Waggoner: Operates an electro-galvanic battery for the cure of diseases, and runs a country store. (D. I. pp. 122–128.)

Joseph M. Wisler: Heater at Steel Works in Steeltown. (Id. pp. 392–396.)

George A. May. Laborer. Heard and understood through machine in March, 1875, while he was working for Jonathan Fry (D. S. Reb. p. 982).

John H. Stephen (D. I. p. 248): Farmer.

Margaret Jane Erb. Was with her brothers Andrew and Jacob Evans, and her sister and Jacob Evans' wife at the time referred to by Andrew Evans. Corroborates him and identifies "D" and "E" (Id. p. 47). Also, by Sarah E. Evans, of same, pp. 55, 60, and by Mary A. Evans, wife of Jacob, pp. 65, 74.

EPHRAIM R. HOLSINGER AND HIS PUBLICATION OF A CARD FOR DRAWBAUGH, NOT INCLUDING IN ITS LIST OF INVENTIONS THE TALKING MACHINE.

(D. vol. I, p. 360): Age, 38; Saxton, Bedford County, Pa. Newspaper man and job printer. Lived at Eberly's Mills from September 13th, 1873, to November 27, 1876, but was never there after he moved away, at the latter date. During this time he was much at Drawbaugh's shop, and assisted the latter a great deal in experimenting. He identifies a large number of instruments as having been seen by him at Drawbaugh's shop, to wit: "A," "B," "D," "E," "F," "I," and testifies that he helped to experiment with all of them. He thus describes some of their experiments:

Q. 26.—Did you and Mr. Drawbaugh ever operate the machines "B" and "F"?

A.—We did.

Q. 27.—What did you do with them?

A.—We connected them with wires through partitions and floors; spoke into one, listened at the other. We had them through the partition, and again through two floors into the basement.

Q. 28.—When you listened at one, and Mr. Drawbaugh talked into the other, did you hear and understand distinctly what he said through the machine?

A.—Yes; very distinctly. Could tell talking and music apart.

Q. 29.—Could you hear and understand the words that were spoken when he talked into the machine?

A.—Yes, sir; he would use such words which have familiar sounds, knowing them to be more hard to understand than those having contrast in sound.

Q. 30.—After you saw Mr. Drawbaugh making the machine "A," did you take part with him in experimenting with the machine and listening to see how the words came through it?

A.—I did.

Q. 31.—How well did that operate?

A.—Somewhat better than the first experiment in which I had acted a part.

Q. 32.—Did you see him make the machines "D" and "E"?

A.—I did.

Q. 33.—Did you talk with him through those two machines while you lived there?

A.—Yes, sir.

Q. 34.—To the best of your recollection, about what time was it when you and Mr. Drawbaugh first experimented with those two machines, " D " and " E "?

A.—About the middle of the summer, 1875.

Q. 35.—Did you and he, after you first saw those two machines, " D " and " E," experiment with them a good deal, or not much ?

A.—Very frequently.

Q. 36.—Did you hear and understand distinctly what was said through those machines ?

A.—We did; we could speak through this one (holding up " D ") and hear what the other one said with it also; and the same with " E."

* * * * * *

Q. 53— In any of your experiments with Mr. Drawbaugh at his shop, did one of you whisper through the machines, or make any other noises than talking and singing, to see how they would convey such sounds?

A.—We did. We whispered, we scratched on pieces of wood, with pieces of old file, we rubbed paper together between our fingers, and then would ask one another whether one could tell what the other one done, or how the noise was made. We asked this through the machines and otherwise. We would hold the paper, or whatever we used, by which the noise was made, to the mouth-piece of the machine.

Q. 54—And could you distinguish through the machine how any of those various noises were made?

A.—Most generally.

This witness was called by the Complainants (Comp. vol. II, p. 1,210), who proved by him that he published a card for Drawbaugh (Id. p. 1,213), before June, 1874, containing a partial list of inventions and not mentioning the telephone. This card figures in many places in complainant's brief, and seems to have taken up considerable space in the opinion of the court.

We say of it:

(1.) It was prepared by Holsinger, without Drawbaugh's supervision, and as a sort of return for Drawbaugh's aid to him in getting him assistance to start a new paper (Id. x. 2, 29, p. 1,219, Q. 5, p. 1,211). It bears internal evidence of inaccuracy in describing inventions of Drawbaugh's, notably in its description of the electric clock.

(2.) *It purports only to give a list of patented inventions.* It omits the stamp canceller, the siphon pump, the machine for wrapping wire, the weather indicator, the gas governor, the automatic boiler feed, all proven by complainants as before that time. It inaccurately gives as patented some things not patented; but Holsinger knew well that the *telephone* was not.

(3.) It purports to give a list of those things likely to bring money-earning business from the surrounding neighborhood, in practical and every-day tools among the people where the card was issued. The only electrical machine mentioned is referred to with a special emphasis on its *simplicity* and the absence of a battery, thus giving assurance of a practical machine for practical uses among the country people.

(4.) As a card issued to farmers, millmen and housewives in Milltown, the advertisement for sale of a double machine for telephoning would have been absurd.

(5.) It was early in 1874, and Drawbaugh had no telephone machines ready for sale, and the card purports to advertise only for sale to the class of people about there, and it omitted the gas governor and wire 'wrappers and the stamp canceller, for the same reason, *i. e.*, such people did not use them.

(6.) As Drawbaugh was then experimenting to make it "talk out," and had not patented it, but was negotiating to get financial aid in the enterprise, he would not care to advertise to patent pirates the matter of his greatest work, to no good purpose

(7.) Drawbaugh was said to be a fool and insane at the same time on account of his devotion to this invention; his labors had come to be unremunerative, and his object was, as shown by his moving to Mechanicsville, the next year, to get every-day work, and let the people know he was doing it without calling marked attention in that community to his "hobby," and the subject of adverse criticism, which was notorious among the people whose custom he sought by the card.

(8.) Holsinger talked through the, to him, perfect, because finished, machines "D" and "E" (not finished until February 1875) in the summer of 1875, a year after the card! and the "experiments," as he calls them, of 1874 were with the rude and unclosed machines "F," "B" and "C."

Finally—After this testimony, and after his memory was refreshed by the card, the witness distinctly and emphatically states to the complainants that his testimony for defendants, as above analyzed, is correct, and says his memory is unchanged. (Complts. II, 1,218.)

Any one of the foregoing reasons are a more complete explanation of the card, than the assumption that this reputable and unimpeached citizen and the host of corroborative witnesses are perjurers, or that Drawbaugh did not advertise the telephone because he did not have it.

Cyrus Orris: Miller. *(Dfts. 1, p. 170).*

Ezekiel Worley (*Id., p. 253-5*): Corroborated by John K. Taylor (*Id., p. 632*).

David K. Ernst (*Id., p. 618*).

David M. Dittlow (*Id., p. 573-4*).

Mrs. Lydia Drawbaugh (*Id., p. 694-6*).

George Natcher (*D. S. Reb., p 141-8*).

Mrs. B. B. Spangler, sister of George Natcher (*Id. p. 176-8*).

George Frederick (*Id., p. 328*).

Henry M. Hamme (*Id., p. 322*): As to January and February, 1876.

DATES.

Of the foregoing witnesses, all, with the exception of those where later dates are given (eight), give their testimony as to having seen or talked with the machines prior to June 2, 1875, the date of Bell's invention; and in every case the testimony shows that the date has been fixed accurately by collateral and convincing circumstances. To illustrate, the dates are as accurately fixed in a great majority of instances as in the case of ex-Congressman Haldeman, of Harrisburg. But to corroborate the dates we call a number of witnesses, who testify as to being told of the machines and of the common report of the machines at the dates which the foregoing witnessess have fixed as the time they saw them; and this latter class of witnesses as accurately fix the dates. There would seem to be no possible collusion here, as when a witness has testified to a collateral fact, we have in almost every instance called a stranger to the witness, giving the direct testimony, to establish the date of such collateral fact.

Springer (D. I, p. 182).

Huyler (Id. p. 375).
Byers (Id. p. 509).
Strong (Id. p. 375).
Byers (Id. p. 382).

HENRY SNYDER (Id. p. 513): This witness testified in the original record, of Drawbaugh's application to him for assistance ; could not fix the date accurately, but thought it was a little earlier than 1875. On sur-rebuttal, Maj. Snyder, since giving his testimony, having died, we called his son, John H. Snyder (Sur-reb., p. 160), and a neighbor, Edward W. Eby (Id. p. 179), who fix the date with absolute certainty as not later than June 19, 1873, Maj. Snyder having pointed out to them Daniel Drawbaugh, and having related to them that he was trying to get him into partnership in a talking machine. Eby fixes the date, because after that date he and Maj. Snyder fell out on a settlement, and were not on speaking terms. The settlement itself is produced, bearing date June 19, 1873.

Dr. Z. Bowman, Id. p. 612.
Ambrose Knaub, S. Reb. p. 38.
Moses Evans, Id. p. 78.
Mrs. Mary Evans, Id. p. 72, who heard her father speak of it, he dying in 1873.
J. M. Brenneman, Id. p. 114.
Miley, Id. p. 170.
John Sprenkel, Id. p. 281.
J. E. Sprenkel, Id. p. 364.
S. H. Bates, Id. p. 380.
Danner, Id. p. 402.
J. E. Spangler, Id. p. 462.
Mrs. Hardesty, Id. p. 483.

Geo. Martin, Id. p. 307.
David Evans, S. Reb. p. 52.
Elizabeth Evans, Id. p. 75.
Mrs. E. Rentzel, Id., p. 83.
M. H. Natcher, Id. p. 135,
William Natcher, Id. p. 49, both Complts'. witnesses.
Mrs. E. Natcher, Id. p. 174.
Krohn, Id. p. 388.
L. J. Klein, Id. p. 377.
E. Ditlow, Id. p. 389.
Blair, Id. p. 410.
Reed, station agent, with books, Id. p. 476.
Salome Hardesty, Id. p. 489.

Harmon Hardesty, Id. p. 493.
Mrs. Kate Young, Id. p. 536.
Mrs. Reynolds, Id. p. 612.
Hackett, Id. p 690.
Zimmerman, Id. p. 822.
Magonnell, Id. p. 963.
N. Egolf, Id. p. 1,023.
Geo. Bricker, Sr., D. I. p. 510.
S.A. North, S. Reb. p. 1,105.
Rev. J. H. Young, Id. p. 1,112.
Bailey, Id. p. 1,119.
Hamlin Hardesty, Id. p. 509.
Wm. Young, Id. p. 539.
Chambers, Id. p. 671.
Mrs. Ella H. Nichols, Id. p. 731.
Mrs. M. Swigert, Id. p. 869.
Scheible, Id. p. 1,020.
Kilmore, Id. p. 1,037.
Samuel North, D. S. Reb. p. 1,102.
Woods, Id. p. 1,107.
J. A. Smith, Id. p. 1,114.
Gher, Id. p. 321.
Burgner, Id. p. 1,137.

To illustrate the method of fixing these dates, Spafford and McHenry (D. S. Reb. pp. 1,089-92), and Bricker (Id. p. 1,083), were commissioners appointed under an act of the Pennsylvania Legislature, of April 3, 1869, printed on Dfts. S. Reb. 1,089. Having filed their report of the complete adjustment in the Court of Common Pleas of Clinton County, November 1, 1869, — a certified copy is shown in this record (Id. p. 248-9). They never saw each other after this survey was completed until they met in Harrisburg to testify in this case. Bricker (Ans. 19, 22), Spafford, (Ans. 11), McHenry, (Ans. 5 and 8). Spafford and McHenry were persons of high standing in the community, and were personally named in the act of April 3, 1869, as commissioners for this important work. Spafford and McHenry were never in Milltown, but heard of Drawbaugh's talking machine from Bricker in October, 1869, while adjusting the Clinton County line, and it was talked of fully by the commissioners at that time. Bricker got his information with regard to it from Henry Drawbaugh at Newville.

Bolye, Brenziger, Goldsmith, Irwin, McGaffic, Stackpole, John H. Updegraff, Mrs. Fry, Mr. Hake, Mr. Young, Mr. Strouse and Mr. Weaver. (Add. proofs, 40, 44, 91, 81, 36, 72, 83, 120, 107, 97, 93, 100), fix the date of Dr. C. E. Updegraff's visit at May 1, 1875, and the dates are fixed by these witnesses conclusively by fixing the time of the visit and the place they started from in Harrisburg and the details of the visit, through the records of the Odd Fellows' lodge, of the places they were boarding in, and by the testimony of fellow-boarders, and of their telling of the talking machine on their return.

THE IDENTIFICATION OF THE MACHINES.

The witnesses for the defense who saw and talked through the machines, identify them as of dates, in harmony with Drawbaugh's testimony as to making them, which, according to the latter's testimony, were in the succession already shown, down to and including "D" and "E," (which are conceded by the other side to have been perfected machines), and all prior to March, 1875.

THE NEW YORK AND PHILADELPHIA TESTS OF THE REPRODUCED TUMBLER INSTRUMENT "F" AND THE TIN CAN INSTRUMENT "B," AND THE MAGNETO INSTRUMENTS "C" AND "I."

A number of the original parts of these instruments exist and are in evidence, and from the parts and from the testimony of Drawbaugh and other witnesses describing them, reproduced instruments were constructed, in order to show the court how they appeared and acted, when completed in all their parts. Of the reproductions "F" was the only one of the four which was a carbon instrument.

It is in evidence that they had been made some time before the New York tests, and had been very roughly handled, and their adjustments were in a loose and shaky condition. It is said that these instruments failed to operate successfully in the New York tests, although they all transmitted words, and even sentences. The court below lays great stress upon the failure of these instruments to do satisfactory work in these tests. The instruments were again reproduced and properly adjusted at Philadelphia, and worked perfectly. It was impossible for the complainants' experts to find any difference between the reconstructed and adjusted machines tested at Philadelphia and the description of them and of their parts and adjustment, as given by Daniel Drawbaugh in his testimony in 1882. It is difficult to see how the criticism could be justly made that the witnesses who testified that they talked through these old instruments, as they originally existed, must have falsified, because of any failure of the New York tests on the reproduced instruments, in the light of these considerations and in the light of the complainants' own testimony. In the original case, complainants' expert, Mr. Pope (*Comp. II, p. 1,419-22*), testified as follows, agreeing with the defendants' expert, Mr. Benjamin:

C. Q. 267.—"What mechanical part essential to a tele-" phone receiver, do you find in Bell's instrument, illustrated " in Fig. 7 of his patent of March 7, 1876, that you do not " find in Drawbaugh's instrument, 'Reproduced B'?

A.—" Nothing; I regard the two receivers as sub-" stantially alike.

C. Q. 268.—" What mechanical part essential to a " telephone transmitter, do you find illustrated in Fig. 7 of

" Bell's said patent, that you do not find in Drawbaugh's " instrument, 'Reproduced B'?

A.—" No essential part, but in answering this I assume " that a source of electricity must be used in connection " with each to constitute it a transmitter. The instruments " themselves are substantially the same.

C. Q. 269.—" A continuous electric circuit, including " a battery and two of Drawbaugh's 'Reproduced B' in" struments would present substantially the same contriv" ance and arrangements as is shown in Fig. 7 of Bell's " patent of March 7, 1876; would it not?

A.—" It would.

C. Q. 270.—" What mechanical part essentially to a " telephone transmitter or a telephone receiver do you find " represented in Fig. 7 of Bell's said patent that is not " contained in Drawbaugh's reproduced instruments 'C' " and 'I'?

A.—" Assuming 'C' and 'I' to be coupled together " in a continuous circuit, there appears to be nothing " essential contained in Fig. 7 of the patent that is not " found substantially in instruments 'C reproduced' and " 'I reproduced.'

C. Q. 271.—" Answer the same question, assuming a " continuous circuit with Drawbaugh's instrument 'C re" produced' and his instrument 'A' in the line?

A.—" I make the same reply to this question, with the " understanding that a battery is placed in the continuous " circuit with the Drawbaugh instruments.

C. Q. 272.—" Answer the same question, assuming a " continuous circuit with a battery and with Drawbaugh's " instrument 'I reproduced' and his instrument 'A' in " the line?

A.—" The same answer is also applicable to this couple.

C. Q. 273.—" Answer the same question, with Draw-" baugh's instrument 'B reproduced' and his instrument " 'F' in a continuous circuit with a battery?

A.—"The same answer is also applicable to this couple.

C. Q. 274.—"Answer the same question, with Draw-" baugh's instrument 'B reproduced' and his instrument " 'D' in a continuous circuit with a battery?

A.—"*Assuming 'D' to be in a working condition,* " *which it was not when I saw it, I again repeat the* " *answer with reference to this couple.*

C. Q. 275.—"Answer the same question, with Draw-" baugh's instrument 'C reproduced' and his instrument " 'E' in a continuous circuit with a battery?

A.—" I again repeat the same answer as to this couple.

C. Q. 276.—" Answer the same question, assuming " Drawbaugh's instrument 'I reproduced' and his instru-" ment 'E' in a continuous circuit with a battery?

A.—" I repeat the same answer as to this couple.

C. Q. 277.—" Answer the same question, assuming " Drawbaugh's instrument 'C reproduced' and his instru-" ment 'D' in a continuous circuit with a battery?

A.—" I repeat the same answer, on the assumption, " as before, that 'D' is in working order.

C. Q. 278.—" Answer the same question, assuming "Drawbaugh's instrument 'I reproduced' and his instru-" ment 'D' in a continuous circuit with a battery?

A.—" I repeat my answer, which is the same as to the " preceding question.

C. Q. 279.—"Answer the same question, assuming " Drawbaugh's instruments 'D' and 'E' in a continuous " circuit with a battery?

A.—" My answer is the same as to question 277."

(Recess until 3 P. M.)

C. Q. 280.—" Answer the same question, assuming " a continuous circuit with a battery, with Drawbaugh's " instruments 'A' and 'reproduced B' in line?

A.—"*I find no mechanical part essential to a telephone " transmitter or telephone receiver represented in Fig. 7 " of Bell's patent that is not contained in the instruments " referred to in the question*, assuming, as before, that they " are placed *in a continuous circuit with a battery*.

C. Q. 281.—" Answer the same question, assuming " Drawbaugh's 'reproduced B' and 'reproduced C' in a " continuous circuit with a battery?

A.—" I repeat my last answer as to this couple.

C. Q. 282.—" Answer the same question, assuming " Drawbaugh's 'reproduced B' and 'reproduced I' in a " continuous circuit with a battery?

A.—" I repeat my answer to question 280, as to this " couple.

C. Q. 283.—" Answer the same question, assuming " a couple of Drawbaugh's instruments 'reproduced C,' in " a continuous circuit with a battery?

A.—"I repeat my answer to question 280, as to this " couple.

C. Q. 284.—"Answer the same question, assuming a " couple of Drawbaugh's instruments 'reproduced I,' in a " continuous circuit with a battery?

A.—" I repeat my answer to question 280, as to this " couple.

C. Q. 285.—" Answer the same question, assuming a " couple of Drawbaugh's instruments 'E' in a continuous " circuit with a battery?

A.—" I repeat my answer to question 280, as to this " couple.

C. Q. 286.—" Answer the same question, assuming

" Drawbaugh's instruments 'A' and 'E' in a continuous " circuit with a battery?

A.—" I repeat my answer to question 280, as to this " couple.

C. Q. 287.—" Answer the same question, assuming " Drawbaugh's instruments 'A' and 'D' in a continuous " circuit with a battery?

A.—" I repeat my answer to question 280, as to this " couple, assuming 'D' to be in its original uninjured con- " dition.

C. Q. 288.—" *Answer the same question, assuming a " couple of Drawbaugh's instruments 'D' in a continuous " circuit with a battery?*

A.—" *I repeat my answer to question 281, as to this " couple, assuming 'D' to be in its original uninjured " condition.*

C. Q. 289.—" In a speaking-telephone line, it is not " necessary to have a battery in the line, provided the " electro-magnet of the transmitting instrument is polarized " by a permanent magnet; is it?

A.—" It is difficult to get any results without a bat- " tery, unless the transmitting and receiving instruments " are both polarized. *The results are, at least, very infe- " rior, and I should rather say that the battery is necessary, " unless both batteries are polarized.*

C. Q. 290.—" *In Drawbaugh's instruments, 'D,' " 'E,' 'Reproduced C' and 'Reproduced 'I,' the electro " magnets are polarized by a permanent magnet, are they " not?*

A.—" *They are.*

C. Q. 291.—" Suppose we should couple those instru- " ments together in a continuous circuit without a battery " in any of the following couplets, to wit: C and D C;

" and E; C and I; D and E; D and I; E and I; or should " use a pair of the same instruments as C and C; D and D; " E and E; or I and I; what part essential to a speaking " telephone transmitter or receiver do you find represented " in Fig. 7 of Bell's patent of March 7, 1876, that you " would not find contained in each of said couplets?

A.—" *Every part essential to a speaking telephone* " *transmitter or receiver, which is represented in Fig. 7,* " *of the patent, is represented by a corresponding part in* " *each of the couples enumerated in the question. The* " *construction is not precisely the same, nor are the proportions similar in many cases. And the source of electricity, which in the patent is a battery, is replaced by a* " *permanent magnet in each of the couples.*"

We now quote from the same expert as to the reproduced instruments which were satisfactorily tested at Philadelphia. (*Add. proofs, p. 422, Ans. 4.*)

" I have compared the instruments referred to in the " question very carefully, part by part. The Philadelphia " instruments are constructed in a much more thorough and " workmanlike manner than the New York instruments, and " are generally much better finished. Every separate part " of each of the Philadelphia instruments is of better workmanship and better proportion than the corresponding " parts of the New York instruments. *One very important* " *point of superiority in the Philadelphia instruments is the* " *rigidity of all the parts intended to be fixed, and the* " *greater accuracy of movements in the adjustable parts,* " *thus affording an adjustment which is positive, and which* " *may be relied upon to maintain itself, while at the same* " *time it may be made very delicate.*"

" In respect to the transmitters, I noted especially " that the diaphragms were well made, carefully fitted into "their seats, and rigidly clasped; that the rods were "securely fastened and the plunger very securely fitted, "yet capable of moving freely in the tumbler containing "the carbon powder. All these improvements are of a "character to greatly increase the efficiency of the apparatus,"

It is difficult to see wherein the essential parts of these machines differ, and it is perfectly plain that the New York tests failed of perfect action from the rough treatment the machines had had, and, from having been shaken out of adjustment. Complainants' witness, Prof. Wright, of Boston, in his notes of the tests of the instruments used in New York, states the results as follows: "'F', reproduced as transmitter; Drawbaugh talking, "Tisdale receiving — heard very well; understood very "well, numerals counted, and conversation." Whatever instruments were used by complainants' experts, Pope, Cross and White, in their private tests, were not put in evidence, and they were unable to say they were reproductions of the instruments used at New York and Philadelphia, and they never tested the reproductions used by Prof. Barker at Philadelphia. (See Pope, cross interrogatory, p. 23.)

The evidence of the Philadelphia tests appears at p. 543 Additional proofs; the New York tests, 4 Complts., pp. 481, 474; Complts. Exhibit 4.

RECAPITULATION.

One—The defendants' testimony-in-chief, excluding Drawbaugh's, is of such positive character, relating to exceptional and unusual facts; is so copious from many and widely disconnected sources, and withal so consistent and harmonious, that, in the language of the learned Judge below, it "IS SUFFICIENTLY FORMIDABLE TO OVERCOME "THE LEGAL PRESUMPTION OF THE VALIDITY OF THE "COMPLAINANTS' PATENT." (Opinion, p. 21.)

Two—The complainants' proofs in reply, do not, under the settled policy of the law of evidence, create a flaw upon the face of the case made, much less destroy it.

Three—Case authorities to the point that doubtful direct testimony in support of the claims of an alleged inventor, may be overthrown by evidence of his inconsistent conduct, fraudulent fabrications or evil tendencies, have no application in weighing direct evidence of the higher order presented here. If it had been shown that he was a rogue and a falsifier, Drawbaugh would not be beyond the pale of the law for the protection of inventors, if the evidence otherwise established his claim to an invention.

Four—But Drawbaugh's story, his character and conduct, and the conditions in which we find him, are all consistent with, and corroborate, the case otherwise made.

In this regard every premise of the opinion below, upon which this decree rests, is at fault. These premises are:

(*a*.) That a man of Drawbaugh's education and environment could not have invented the telephone.

(*b*.) That a man who busies himself with minor "mechanical contrivances" could not have produced a great invention. In other words, a great discovery in physics could not be made by a man unless his mind had always been on great discoveries; an *a priori* argument that to establish a claim to a great invention, the claimant must show some previous invention approximately as great.

(*c*.) That the issue of an advertising card, to the farmers, millers, mechanics and housewives of a country village, soliciting trade for his shop, is an admission that he was not working upon and had no telephone at a period when seventy unimpeached witnesses, and himself, testify positively that he had the telephone, and that he was so working at that time.

(*d.*) That Drawbaugh fabricated the story of his poverty, when the court records of his judicial district show judgment after judgment against him, on claims for the necessaries of life, medical attendance for his fatally ill children, and for the roof that covered his head; and when the community in which he lived corroborates the record.

(*e.*) That Drawbaugh was a charlatan, beause a provincial scribbler was florid in the style of a printed notice of him.

(*f.*) That Drawbaugh and these witnesses, when they say that they talked through the more or less crude instruments made prior to 1875, falsify, or are mistaken in their statements, on the following grounds:

Some of the original parts having been lost or worn out, two sets of reproductions were made, both in exact correspondence with the original machines, and when tested at different times, one set being older and shaken out of adjustment, did not work perfectly; though the other, with accurate and firm adjustments, stood all the tests as practical telephones.

We submit that the decree should be reversed and the bill dismissed.

DON M. DICKINSON,
Of Counsel.

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126-2

Supreme Court U. S.
FILED.
JAN 18 1887
JAMES H. McKENNEY,
CLERK.

IN THE

Supreme Court of the United States.

OCTOBER TERM, A. D. 1886.

THE PEOPLE'S TELEPHONE COMPANY ET AL.,
Appellants,
vs.
THE AMERICAN BELL TELEPHONE COMPANY ET AL.,
Appellees.

THE OVERLAND TELEPHONE COMPANY ET AL.,
Appellants,
vs.
THE AMERICAN BELL TELEPHONE COMPANY ET AL.,
Appellees.

APPELLANTS' BRIEF ON THE BELL PATENTS.

GEORGE F. EDMUNDS,
DON. M. DICKINSON,
CHARLES P. CROSBY,
LYSANDER HILL,
T. S. E. DIXON,
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CHICAGO LEGAL NEWS CO. PRINTERS, 175 MONROE STREET

IN THE

UNITED STATES SUPREME COURT.

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THE OVERLAND TELEPHONE COMPANY ET AL.,
Appellants,
vs.
THE AMERICAN BELL TELEPHONE COMPANY ET AL.,
Appellees.

STATEMENT OF ERRORS.

1. The court below erred in holding the Bell patents in suit, or either of them, valid.

2. It erred in holding said patents, or either of them, to have been infringed by the defendants, or any of them.

3. It erred in holding that Daniel Drawbaugh was not the first and original inventor of the inventions here in suit.

4. It erred in not holding Elisha Gray to have invented the electric speaking telephone, in its variable resistance

5. It erred in not holding the Bell patent of March 7, 1876, here in suit, to be fraudulent and void, in view of the evidence as to fraudulent changes in the application therefor, and the fraudulent introduction of Gray's inventions into said application, while pending in the patent office.

6. It erred in not holding the Bell patent of January 30, 1877, here in suit, to be fraudulent and void, in view of the evidence as to the fraudulent introduction of Elisha Gray's said inventions into the same.

7. It erred in not holding Bell to have surreptitiously and unjustly obtained both of said patents for that which was in fact invented by another (to wit: by Elisha Gray), who was using reasonable diligence in adapting and perfecting the same.

8. It erred in not holding Bell to have surreptitiously and unjustly obtained both of said patents for that which was in fact invented by another (to wit: by Daniel Drawbaugh), who was using reasonable diligence in adapting and perfecting the same in his various improved instruments.

9. It erred in not dismissing the appellees' bill for want of equity and right, in view of the frauds shown by the appellees' own evidence to have been perpetrated upon the Patent Office, Elisha Gray and the public in the procurement of the patents, and remaining in the patents, on which said bill is founded.

10. It erred in construing said patent of March 7, 1876, here in suit, to cover anything more than a magneto-electric current generated by the vibration, by sound waves, of a body of inductive material in the presence of a body susceptible of receiving induction therefrom; and it further erred in not holding such a patent for a *current* to be a

patent for an "effect," "mode of operation" or "principle," and therefore void.

11. It erred in not holding said patent of March 7, 1876, to be limited to the described apparatus of its figure 7—there being, as the appellees contend, no "art" then known, and there being no equivalents for this apparatus described in the specification.

12. It erred in not holding said patent of January 30, 1877, to be invalid and void, by reason of its claiming matters described and shown, but not claimed in Bell's prior patent of March 7, 1876, the application not having been filed till after the former patent was issued, and said matters not having been reserved in said prior patent as matters to be afterwards applied for, but having been abandoned to the public by describing and showing without claiming them, in said prior patent.

13. It erred in not limiting the scope of the claims of the patent of January 30, 1877, here in suit, to mere improvements in the form of the parts mentioned in said claims.

14. It erred in holding that the specification of Bell's patent of March 7, 1876, describes the speaking telephone invention with the clearness, fullness and exactness which the statute requires in such cases; and that the patent is not invalid for want of a proper description and specification of said alleged invention.

15. It erred in holding that Bell, in the sense of the patent law, completed or made any invention of an electric speaking telephone before a date later than March 7, 1876; and, therefore, in not holding the patent void, as being for an invention not made, at or prior to its date, by the patentee.

16. It erred, throughout its opinions in the case

against the People's Telephone Company, in treating of the evidence as to Drawbaugh's priority of invention, by ignoring, misconstruing, misstating, and misunderstanding the evidence; by assuming things of which there was no evidence, or which were contrary to the evidence; by misunderstanding and misapplying the law; and by attributing different degrees of probative force to the same kinds of evidence accordingly as it found the same on the one side or on the other side of the case. These errors are too numerous to be set out here in detail, but reference for them is to be made to appellants' brief on the Drawbaugh evidence herewith filed, pages 277 to 311 inclusive, where the same are set forth in detail.

L. HILL,
Of Counsel for the People's Telephone Co.,
and the Overland Telephone Co., Appellants.

Supreme Court of the United States.

THE PEOPLE'S TELEPHONE CO. ET AL.,
Appellants.
vs.
AMERICAN BELL TELEPHONE CO. ET AL.,
Appellees.

THE OVERLAND TELEPHONE CO. ET AL.,
Appellants.
vs.
SAME,
Appellees.

Appellants' Brief on the Bell Patents.

In this brief, we shall first review the history of Alexander Graham Bell's connection with the invention of the Electric Speaking Telephone, and shall then consider the questions of what he attempted to patent; after which, we shall discuss, in their logical order, various matters that we regard as conclusive of the invalidity of both patents, as well as of non-infringement by the appellants.

For convenience and clearness we prefer to discuss the history of Mr. Bell's connection with the development of the speaking telephone in the form of a review of his own account of it, as contained in a preliminary statement filed by him in the telephone interference in the Patent Office, in November, 1878.* (C. Exhibits, p. 997.)

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* NOTE.—The appellee's four volumes of proofs will be cited in this brief as C., Vol. 1, C., Vol. 2, C., Vol. 3, C., Exhibits, or Vol. 4—C. meaning complainant below.

The appellant's six volumes will be cited as D., Vol. 1, D., Vol. 2, D. S-reb., D. S-rej., D., Exhibits, and D. Add. Proofs.—D. meaning defendant below.

This preliminary statement is as follows:

DEFENDANTS' EXHIBIT BELL'S PRELIMINARY STATEMENT IN THE "SPEAKING TELEPHONE INTERFERENCES."

Complainants' Record, page 1695.

IN THE MATTER OF THE INTERFERENCE
between
ALEXANDER GRAHAM BELL
and

PRELIMINARY STATEMENT OF ALEXANDER GRAHAM BELL.

I am a native of Great Britain, and left that country in 1870, for Canada. My chief subject of study from my boyhood upward has been the mechanism and nature of speech. The fact that this study has been my father's professional pursuit had directed my own studies in the same direction, and my father always intended that I should follow the same pursuit. *Two or three years before I left England I became acquainted with Helmholtz' experiments concerning the analysis and synthesis of vocal sounds. I was especially interested in his experiments for reproducing vowel sounds by means of tuning forks set in vibration by electrical currents.*

On thinking over these experiments, the thought occurred to me that if it were possible to reproduce vowel sounds by means of an electrical current, surely some means could be found to reproduce electrically the other elements of articulate speech, and that it would become one day feasible to speak by telegraph. I had at this time too slight a knowledge of electrical subjects to apprehend fully the operation of the apparatus employed by Helmholtz *and I did not then form any idea of any means* by which my conception of the possibility of producing articulate sounds, other than those which Helmholtz had produced, could be accomplished. *I did not even at that time propose to attempt the solution of the problem.* I merely looked upon it as a problem that some one would surely solve. The explanation which was given me of Helmholtz' experiments so interested me that I devoted myself to the study of electricity, my special object being to acquire a sufficient knowledge of the subject to enable me to understand Helmholtz' experiments. I was thus led to the study of telegraphy as a branch of electrical science, and to the conception of a method of transmitting simultaneously, along a single circuit, a number of distinct telegraphic messages by means of musicial sounds of long or short duration, giving signals to the ear similar to those that the Morse recording instruments give to the eye. The plan which I conceived was to use transmitting instruments of different pitch, each similar to the transmitting tuning fork employed in Helmholtz' vowel experiments, the receiving instrument to consist of an instrument like a piano with electro-magnets beneath the strings. I conceived that a current from a local battery, connected with each tuning fork, could be sent over a main line and set in vibration the string corresponding in pitch to that of the tuning fork brought into the main circuit.

The interruption of this current by a key for longer or short intervals might be made to give sound signals from the receiver corresponding to the visible signals made by a Morse recorder. I did not construct this apparatus while in England, but I made some efforts to reproduce the experiments of Helmholtz.

After arriving in Canada, I pursued my electrical and acoustical studies, and made such experiments relating to multiple telegraphy as I had the means of making at my father's residence. I had good facilities for study, but very insufficient means for experiments. In October, 1872, I removed to Boston with the intention of making the United States my permanent residence. My professional occupation at this time was giving instruction in articulation to deaf mutes and lecturing upon the mechanism and nature of speech to teachers of the deaf and dumb who came to me from different parts of the world. My spare time I devoted to electrical studies and experiments with a view to perfecting multiple telegraphy.

In developing my plan of multiple telegraphy certain difficulties made their appearance, and I devoted myself during a summer vacation spent in Canada, in 1874, to devising means to overcome these difficulties, and also to devising new methods of studying sound optically, as aids in teaching articulation to the deaf. The means I proposed to employ for transmitting musical signals simultaneously in both directions along the same circuit was to induce an intermittent current upon the line wire, by opening and closing with extreme rapidity the primary circuit of an induction coil the secondary wires of which were in circuit with the line. Upon reasoning out the effects produced, I saw that a current in one direction would be induced in the secondary circuit when the primary circuit was closed, and a current in the other direction when it was opened, and I feared that the alternate, positive and negative impulses would be insufficient to set my receiving instrument into musical vibration, unless these impulses, which acted upon the plate or spring, were at equal intervals apart, and the plate or spring, which constituted the armature of the receiving electro-magnet was itself permanently magnetic, so as to be attracted and repelled as the pole of the electro-magnet was changed by the reversal of the current.

To make this plate permanently magnetic I proposed to attach it to one pole of a permanent magnet. It then occurred to me that if this magnetic vibrating plate or armature were set in motion mechanically, it would induce positive and negative currents like those which I had proposed to send through the instrument to set the armature in vibration; I then saw that two similar instruments might be placed in a circuit and that the vibration in the armature of one would produce corresponding vibration in the armature of the other, and if the vibration of the armature of the inducing instrument was such as to produce a musical tone, the corresponding vibration of the other armature would produce the same musical tone. It will be understood, of course, that both armatures were to be tuned to the same pitch.

I then conceived the plan of attaching a number of springs, of different musical pitch, to each pole of a permanent horseshoe magnet, so that the two sets of springs should lie in parallel planes; between the ends of these springs, which by their attachment to the permanent magnet became themselves magnets, an oblong electro-magnet was to be placed.

The vibration of any one or more of the springs would induce corresponding electric currents in the electro-magnet when its circuit was closed, and if a second similar instrument was placed in the circuit I conceived that the armatures of this instrument would vibrate, which corresponded in pitch to those which were vibrating in the first instrument, and would give out the same musical tones. It then occurred to me that, not only would the armatures of the second instrument respond to notes of similar pitch, but that the loudness of the sounds produced would be dependent upon the amplitude of vibration of the armature of the first instrument, for the strength of the electrical impulses produced by the armature of the first instrument, would depend upon the amplitude of their vibration, and the amplitude of the vibration of the armatures of the second instrument would depend upon the strength of the electrical impulses; hence, if a number of armatures of the first instrument were to be set simultaneously in vibration with different relations of force, the corresponding armatures of the second instrument would be thrown into vibration with corresponding relations of force.

It at once occurred to me that the results obtained by Helmholtz in the reproduction of *vocal sounds* might be obtained by this instrument. Helmholtz obtained his effects by causing tuning forks of different pitch to vibrate simultaneously, increasing the loudness of the sounds by external re-enforcement by the means of resonators. It seemed to me that *the same result* could be obtained by causing the armatures of my instrument to vibrate with greater or less force, and that this could be done by simply uttering a sound in the neighborhood of the first instrument. When a sound is uttered in the neighborhood of a musical instrument, like a piano or harp, each vocal sound is analyzed by the instrument into its component musical elements, and those strings of the piano or harp which correspond in pitch to the fundamental and overtones of the sound, are thrown sympathetically into vibration by the action of the air, and the relative amplitudes of the vibrations of the different strings correspond to the relative loudness of the fundamental and overtones of the sound. Hence I conceived, that if a sound should be uttered in the neighborhood of the first instrument, certain of the armatures, corresponding in pitch to the fundamental and overtones of the sound uttered, would be thrown into vibration with the proper relations of force, and the armatures of the second instrument corresponding in pitch to the fundamental and overtones uttered, would be thrown into vibration with corresponding relations of force, and would thus produce a sound having the same components as the original sound. Reflecting upon this arrangement and its likeness to the internal organ of hearing in the human ear, known as Corti's organ, convinced me that *if we could have a multitude of armatures comprehending the whole scale of musical sounds audible to the human ear, the successive notes being so close together as only to differ infinitesimally from one another in pitch*, then upon speaking to such an instrument, the consonant and vowel sounds affecting the armatures of the first instrument would be reproduced by the armatures of the second instrument.

In fact sounds or noises of any kind made in the neighorhood of the first instrument would be reproduced by the second instrument.

All these reflections occurred during this visit in Canada in the summer fo 1874. At the same time, as I have already mentioned, I was making an optical study of sound for the purpose of exhibiting to the eyes of the deaf the shapes of the vibration due to vocal sounds, so that they might compare these shapes with the shapes which they, in their own attempts to produce sounds, saw exhibited in the manometric flame of Koenig.

For that purpose I had taken with me to Canada a human ear in hopes that I might be able to use the ear itself as a phonautograph, as suggested to me by Dr. Clarence J. Blake, of Boston, who kindly lent me the ear to experiment with.

I have still in my possession a number of glass plates with tracings of the vibrations of the human ear, caused by uttering different vocal sounds. These tracings bear dates in July and August, 1874, which dates were made upon the plates at the time the tracings were taken.

Studying these tracings in connection with Helmholtz' researches, I was led to see that they represent graphically the resultant vibration of the air caused by the fundamental and overtones of the voice. I was also struck with the fact that so small and delicate an organ as the membrane of the ear should be able from the impulses of the air to put in motion the comparatively large and massive bones contained in the tympanum.

Helmholtz has pointed out that a graphical representation of the vibrations of the air caused by simple musical tone, or in other words, a simple pendulous vibration is a simple curve of a peculiar kind, called a sinusoidal curve, and that the graphical representation of the vibration of the air, caused by a sound of any other kind is the resultant of a number of sinusoidal curves superposed, one upon the other, representing graphically the fundamental and overtones that go to make up the sound.

I conceived in like manner that an analogous electrical effect would be produced upon the line wire between the first and second instruments previously described, caused by the superposition of currents due to the vibrations of the armatures corresponding to the fundamental and overtones of the sound uttered.

I was thus led to the idea that a single armature might be put in motion in such a way as to produce directly a current which should correspond to the resultant current due to the vibration of the armatures which would respond to the fundamental and overtones of the sound.

The question then arose in my mind, whether an armature might not be set in motion by a membrane similar in shape and structure to that in the human ear, so as to produce a current which should correspond to the vibrations of the air. *I did not, at this time, devise any method of combining a membrane with an armature or attempt to construct any apparatus upon the plans I had conceived.* I now constructed the instrument which I have described, made up of a number of armatures attached to a permanent magnet and tuned to different pitches, and which I had devised with special reference to multiple telegraphy, *because I thought that the currents which would be induced, would be so exceedingly weak that no useful effect would be produced by them corresponding to what I had theoretically attributed to them.* I therefore *turned my attention to other modes* of working out my plans of multiple telegraphy, which I was thoroughly bent upon reducing to practice immediately. I did, however, explain to my father and to other friends, in Canada, my ideas as they occurred.

When I returned to Boston in September or October, 1874, being without means of prosecuting my experiments, I made arrangements with Mr. Sanders and Mr. Hubbard to furnish funds for the prosecution of my experiments, and to enable me to patent my inventions. *At their earnest request I devoted myself to the development of my system of multiple telegraphy, and applied for patents in the winter of 1874 and 1875.*

I did, however, shortly after my return from Canada, have several interviews with Dr. Blake for the purpose of showing him the experiments I had made and of obtaining further information with regard to the structure and mechanism of the human ear, to aid me in my efforts to devise a method of producing vocal sounds electrically; and we carried on, conjointly, a series of experiments to obtain tracings of the vibration of the bones of the human ear. At one of these interviews I explained to him the various plans which had occurred to me for multiple telegraphy and the transmission of speech; and I made a number of rude sketches in his presence, illustrating these plans. Among them is to be found a sketch of an instrument showing two free reeds or springs attached to the poles of a permanent magnet and surrounded like harmonium reeds with casings adapting them to be vibrated by wind. Another figure on the same sheet exhibits two horseshoe permanent magnets with their poles placed opposite each other, surrounded by helices forming part of an electric circuit. Between the poles of the magnets vibrating reeds are placed, which were to be of steel. The mechanical vibration of these reeds would produce electrical currents alternately in one direction and the other, and varying in strength at different parts of the vibration of the reeds, so as to produce an undulatory current regular in point of time, but varying in strength during any single vibration of the reed, in proportion to the different velocity of the reed in the different parts of its path.

On the same sheet is a representation of the instrument I have before referred to, where several springs were attached to the poles of a permanent magnet having between them the poles of an elongated electro-magnet, over a portion of which each spring could vibrate.

I am certain that I made sketches of these devices while in Canada, but I am unable to find any earlier than these given to Dr. Blake.

I had an apparatus constructed for a receiving instrument, in which a free reed, to be set in vibration by an electro-magnet, and produce a musical sound, was attached to the pole of a permanent magnet. This was in the winter of 1874 and 1875, and is described in one of my applications for patents made in February, 1875.

While in Washington attending to this business I called upon Prof. Henry and explained all my inventions to him.

His appreciation encouraged me very much, and *he pronounced my plan for the electrical production of articulate speech the germ of a great invention.*

I recollect explaining to him the idea of an instrument with a number of armatures tuned to different pitches which I have be-

fore described, and it was with reference to this apparatus that he made the above remark. He showed me the various electrical and acoustic instruments which he had in the Smithsonian Institute *including Reis' telephone. I had previously seen in the Institute of Technology, in Boston, the receiving instrument of Reis' telephone; and was acquainted with the construction of the whole apparatus by diagrams and printed descriptions,* but I had never before seen the transmitting portion of the apparatus.

We had some conversation *about the mechanical power of stretched membranes,* I can not recollect the details of it, but I remember that the effect of his remarks was rather discouraging as to my being able to obtain the results from a stretched membrane which I had hoped. I remember that the impression left upon my mind *was that each stretched membrane would have a rate of vibration peculiar to itself.*

On my return to Boston from Washington, as my partners, Mr. Hubbard and Mr. Sanders, considered the system of autograph telegraph for which I had obtained Letters Patent, likely to be more immediately valuable than any others of my inventions. *I devoted my attention chiefly to the details of an autographic instrument,* but I continued studying the subject of the electrical production of articulate sound.

I had an apprehension, I may call it a belief, that the varying currents which would be produced by the means which had previously occurred to me, and to which I have already alluded, *would be too weak to produce the results which I desire to obtain; that they would not be able to set their armatures in vibration to the extent requisite to produce audible sounds.* I had then no idea of the extreme minuteness of amplitude which can produce a sound, and I remember that my thoughts were directed to utilizing the current derived from a battery, the strength of which should be made to vary by varying the resistance of the circuit through which it was passed. I sought to discover some method of varying this resistance proportionally to the varying vibration of the air. In a letter which I wrote to a friend on the fourth day of May, 1875, and which is now before me, I referred to this subject in the following language: "Another experiment has occurred to me, which, if successful, will pave the way for still greater results than any yet obtained. The strings of a musical instrument in vibrating undergo great changes of molecular tension. In fact, the vibration represents the struggle between the tension of the string and the moving force impressed upon it. *I have read somewhere that the resistance offered by a wire to the passage of an electrical current is affected by the tension of the wire.* If this is so, a continuous current of electricity passed through a vibrating wire should meet with a varying resistance, and hence pulsatory action should be induced in the current. If this turns out to be the case, the oscillations of the current should correspond in amplitude, as well as in the rate of movement, to the vibration of the string.

One consequence would be that the timbre of a sound could be transmitted. The plan for transmitting timbre that I explained to you before, viz., causing permanent magnets to vibrate in front of electro-magnets, is chiefly *defective on account of the feebleness of the induced currents.* If the other plan is successful, the strength of the current can be increased *ad libitum* without destroying the relative intensities of the vibration."

On the 2d of June, 1875, I wrote the following letter, referring to an experiment which I will relate:—

SALEM, MASS., June 2d, 1875.

DEAR MR. HUBBARD:

I have accidentally made a discovery of the very greatest importance in regard to the transmitting instruments. Indeed, so important does it seem to me, that I have written to the organ factory to delay the completion of the reed arrangement until I have had the opportunity of consulting you. *I have succeeded to-day in transmitting signals without any battery whatever.* The musical note produced at the receiving end was sensibly the equivalent of that at the transmitting end, in loudess *as well as pitch.*

I shall call upon you to-morrow (Wednesday) evening as there are several matters I wish to talk over with you. In haste. Yours Respectfully, A. GRAHAM BELL.

GARDINER G. HUBBARD, Esq., Brattle Street, Cambridge.

I had arranged an apparatus relating to multiple telegraphy, which consisted of several transmitting instruments and two sets of receiving instruments to correspond, representing three stations on a circuit. The transmitting instrument consisted of a steel spring, which was thrown into vibration by the action of an electro-magnet and local battery. In the course of its vibration it struck alternately two fixed platinum points, one connected with the local circuit the other with the main. The depression of a key directed the intermittent current from the main battery on to the line wire through the receiving instruments.

Each receiving instrument consisted of U-shaped electro-magnet having a coil upon only one of its legs; a metal spring was clamped firmly to the uncovered leg of the magnet and its free end was over the other pole. When an intermittent current passed through the coil of the receiver, the spring armature was set in vibration, when its normal pitch corresponded to the pitch of the transmitting instrument which interrupted the current.

On the 2d of June I was trying this apparatus with my assistant, Mr. Watson. I was at the transmitting station where I operated the keys. The receiving instruments of the second station were in the same room where I could observe them. Those of the third station were in an adjoining room, under the observation of Mr. Watson. I pressed down the keys of the transmitting instruments successively, and the corresponding receivers responded, excepting in one case.

Thinking that the spring armature of this receiver at Mr. Watson's end might be sticking to the pole of the magnet underneath, I called to him to pluck it up. At the moment he did so, I observed that the armature of the corresponding receiver at the second station was thrown momentarily into vibration, although I had depressed none of the transmitting keys, so that there was no battery upon the circuit. This seemed to me so extraordinary that I immediately determined to investigate the matter, and called to Mr. Watson to continue plucking the spring until I told him to stop. I cut the line wire between the transmitting instruments and my receiving instrument, and made a circuit through the receiving instruments independently of the battery, and the effect was produced as before.

I then silenced the transmitting instruments and placed the spring armature of each of the receiving instruments against my ear, and heard distinctly in every case the sound of Mr. Watson's plucking the spring, although only the armature of the instrument corresponding to the one plucked was thrown into visible vibration.

I also recognized the timbre of the sound produced by the plucking of the spring. We finally removed all the receiving instruments from the circuit except two, one at each end.

The same effects were observed, although neither permanent magnet nor battery was included in the circuit.

At once my speculations in Canada, in the summer of 1874, occurred to my mind, and I saw that I had been hasty in coming to the conclusion that magneto-electric currents, induced by the vibration of a plate or spring, would be too feeble to set corresponding armatures in vibration so as to produce audible effects; for, in the experiment I had just made, the residual magnetism of the armature and core of the electro-magnet, though it must have been exceedingly slight, was able, when the spring was thrown into vibration, to induce a current sufficiently strong to set the armature of the other instrument in the circuit into visible vibration so as to produce audible effects.

It will be noticed that *the apparatus I have just described is essentially the same as that represented in Fig. 5*, of the drawings annexed to the patent granted to me March 7th, 1876, and numbered 174,465, which is the subject of this interference, excepting that a battery is included in the circuit in the drawing, to give a greater amount of magnetism in the core of the electro-magnet. I did, in fact, on the second day of June, 1875, repeat these experiments with a battery included in the circuit, and then completed so much of the invention embraced in that patent as is represented in said Fig. 5.

My mind immediately recurred to the use of a membrane as a means of operating an armature so as to correspond with the vibrations of the air caused by vocal sounds; and either on the same day, *or shortly after*. I gave orders for the construction of two instruments in which the armature of an electro-magnet should be moved by the vibrations of a stretched membrane, to which it was connected.

Such an instrument was constructed by Mr. Watson, during the month of June, 1875, but I am unable to fix the exact day.

Upon putting it into a circuit with a battery, the strength of the magnet and the weight of the armature were such as to tear the latter from the membrane, which was composed of gold-beater's skin.

Portions of this instrument are still in existence, and I annex a drawing, marked " A " which corresponds in size with the parts now in my possession, and which correctly represents, as I believe, the instrument as originally constructed.

So far as I can recollect, it was not until the first of July, 1875, that we were able to get the instrument in condition for trial. I fix this date and the nature of the experiment by a letter which I wrote on that day, a copy of which is as follows:

SALEM, MASS., July 1, 1875.

DEAR MR. HUBBARD:

The experiment to which I alluded when I saw you last promises to be a grand success. On singing this afternoon in front of a stretched membrane attached to the armature of an electro-magnet *the varying pitch of the voice* was plainly perceptible at the other end of the line, no battery or permanent magnet being employed when the vibrations are received upon another stretched membrane in place of a steel spring, it is possible—nay, it is probable—that the "timbre" of the sound may be perceived. I hope to try the experiment to-morrow afternoon. This morning in dipping into a French work upon telegraphy, I came across a full description of the "Typo-Telegraphe de M. Bonelli." I find it to be identical with our autograph arrangement, save that five telegraph wires are required instead of one for transmission. Bonelli gets over the difficulty of prepared ink by setting up his message in type. The brush of wires is passed over the raised surface of the letters securing perfect contact at the proper places. I have an engagement to meet Prof. Lovering to-morrow morning at ten o'clock, and shall call upon you before returning to town.

With kind regards,

A. GRAHAM BELL.

GARDINER G. HUBBARD, ESQ.,
Brattle Street, Cambridge.

I have not seen this letter since I wrote it, until within three days, and I had forgotten that I had made any such record of this experiment. It is obvious from this letter that the effects produced must have been due to the residual magnetism remaining in the armature and core of the magnet after having been previously magnetized by the passage of a battery current.

Another instrument with stretched membrane was immediately constructed and the experiment spoken of in said letter was tried of transmitting speech.

One instrument was placed in my experimental room at the top of the building, and the other in the work-shop below. I spoke from my room to Mr. Watson and he spoke to me from below. *I heard nothing*, but Mr. Watson soon rushed up-stairs and said he could hear my voice, *but could not make out what I said.* We then changed places, but *with the same result;* he heard my voice *but I could not hear his.* I am unable to say whether we used the instruments with a battery or without, as on the previous occasion refered to in the letter to Mr. Hubbard. *I am free to say that the results were not as good as I expected, but I believe that the failure to obtain better results was due to the imperfect construction of the instruments, or to their parts not being properly proportioned.* I fully believed that the elements combined in that apparatus were capable of giving better results than I attained in these experiments, and that the instruments embodied an important and valuable invention.

I saw clearly that a current was induced different from that which attended the use of any other apparatus with which I am acquainted, and which was characterized, not by makes and breaks of regular or irregular intervals or even by regular waves or impulses of equal strength or duration, but by impulses which corresponded to the vibration of the air which moved the membrane. I had combined elements which had never before been combined, and had produced entirely new results.

A few weeks after this I was obliged to go to Canada and I was therefore compelled temporarily to suspend my labors upon these inventions. I commenced the draft of the specification for my patent involved in this interference while I was in Canada, and I also endeavored to interest the Hon. George Brown, of Toronto, in my inventions, with a view to have him take out patents for me abroad.

I returned to Boston early in October and resumed work on my specification with a view to placing it in the hands of Mr. Brown, in case of his accepting my proposition. I delayed making out an application for a patent in this country, though repeatedly urged to do so by Mr. Hubbard, in order to make some arrangement with Mr. Brown or some other person to take out foreign patents. I heard nothing from Mr. Brown until my visit to Canada at Christmas, 1875. I visited Mr. Brown in Toronto, at his request, the 28th of December, 1875, and *on that evening, while in Toronto, I made rough pen drawings representing my various inventions, including the apparatus heretofore described, which was constructed in June, 1875, and tried on the first and subsequent days in July.*

Mr. Brown took the specification, and these drawings I had prepared, to England, but did not make an application. The specification and drawings have been in his possession ever since, till within a few days.

I annex a heliotype copy of one sheet of these drawings representing this apparatus, marked "B." There is also upon this sheet a memorandum referring to the trial of this apparatus, *which memorandum was made by me at the same time with the drawing.*

I completed the specification for my American patent early in January, and sent it to Mr. Hubbard in Washington, to be examined by Mr. Pollok. I am not able to fix the date when I sent it, but on the 18th of January I received a letter from Mr. Hubbard, expressing his satisfaction with it, and it must have been returned to me then or immediately after, as I made oath to it in Boston on the 20th of January, 1876, and sent it back to Mr. Hubbard. The reason why it was not filed immediately was that it was deemed important that I should meet Mr. Pollok and go over it with care.

We met in New York shortly after and spent a day in considering the specification. No change whatever was made in it, and Mr. Pollock took it back with him, and filed it in the Patent Office on his return.

I ought to state that I did not, before the filing of my application, construct the devices described in my specification for varying the resistance of a voltaic circuit as means for producing an undulatory current. I was in Washington *the first few days in March*, and *immediately on my return I constructed an apparatus having a wire attached to a stretched membrane, dipping into a vessel containing water*, forming part of a circuit, the resistance of the circuit being varied by the vibration of the membrane, which caused the wire to dip more or less deeply into the liquid. *On the 10th of March Mr. Watson and myself tried this apparatus as a transmitter, using the steel spring armature depicted in my patent as a receiver*, and obtained *intelligible articulation*. I exhibited an instrument constructed in this way at the Centennial Exhibition in June, 1876, before Sir William Thomson and other judges of his department.

(Signed) ALEXANDER GRAHAM BELL.

COMMONWEALTH OF MASSACHUSETTS, SUFFOLK, *ss:*

This twentieth day of November, 1878, personally appeared Alexander Graham Bell, and made oath that the foregoing statement by him subscribed is true. Before me,

[L. S.] CHAS. EUSTIS HUBBARD,
Notary Public.

To this statement it may be added that the devices exhibited by Mr. Bell at the Centennial were crude, experimental and imperfect; that he, during the following fall improved them and perfected his magneto-telephone; that on December 9, 1876, he applied for and obtained an English patent showing and claiming both the apparatus of his March 7, 1876, patent and the telephone improvements made after that date; and that on January 15, 1877, he applied for a U. S. patent for his telephone improvements, and obtained said patent January 30, 1877.

SUMMARY.

From this sworn preliminary statement the following facts clearly appear, viz:

First. That prior to the summer of 1874 Mr. Bell had formed no conception of any means for the transmission of speech.

Second. That in the summer of 1874, stimulated by Helmholtz' experiments in the electrical transmission of *vowel* sounds by means of a series of tuning forks of different pitch, Mr. Bell conceived the possibility of accomplishing "the same results" by substituting a series of vibrating reeds armatures in place of Helmholtz' tuning forks. (This imaginary apparatus which is generally referred to in the evidence as the "harp apparatus," is illustrated in Fig. 8, C. Vol. 1, p. 118, and is fully described in Mr. Bell's answer 37, pp. 118, 119, of the same volume.) But he never, then or at any subsequent time, made or attempted to make or test such apparatus, because he believed it utterly impracticable and incapable of producing any useful result.

Third. That in the summer or fall of 1874, he also formed an inchoate mental conception of the possible production of a similar result by means of a "*membrane similar in shape and structure to that in the human ear,*" but, although he spoke of the plan to Dr. Blake in October, 1874, he *did not devise any method of combining the membrane with an armature, nor attempt to construct any apparatus upon the plan*, because he believed it, like the "harp apparatus," to be utterly impracticable and incapable of producing any useful result.

Fourth. That in March, 1875, he explained his "harp apparatus" to Prof. Henry, and it was of *this* apparatus, and not of the membrane apparatus, that Prof. Henry spoke as containing "the germ of a great invention."*

Fifth. That about May 4, 1875, he made an experiment to test the transmission of an electric current through piano strings in vibration. (This experiment is fully described by Mr. Bell, in his answer 64, C. Vol. 1, pp. 130–132 and answer 362, C. Vol. 2, pp. 1610, 1611, in which latter answer Mr. Bell says, "My general impression is that we either obtained no results or indifferent results, but I can not assert this positively. My impression further is that whatever results were obtained we thought the construction of the piano not suitable for the experiments.") Watson (C. Vol. 1, p. 202) confirms the statement that the experiment was a failure.

Sixth. That on June 2, 1875, Mr. Bell *accidentally*, while experimenting for multiple or autograph telegraph purposes, with instruments that he had long had in his possession, discovered that with two multiple-telegraph instruments arranged in circuit as shown in Fig. 5 of his subsequent patent of March 7, 1876, he could, upon plucking one of the reeds with his finger, hear an audible response from the other, of the same pitch as the normal pitch of the transmitting reed, and with something of the *timbre* of that reed.

Seventh.—That thereupon Mr. Bell, for the first time in his life, conceived the *practical* possibility of transmitting articulate speech by a membrane instrument, and set about to construct one.

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* And it was this "harp apparatus" that Mr. Bell, in March, 1875, regarded as the most important plan he had yet thought of for the electrical transmission of speech. In his letter of March 18, 1875, to his parents, he speaks of it as "the apparatus which I have designed for the transmission of the human voice by telegraph," and he does not, in that letter, mention the other alleged apparatus that the complainants would now have us believe to have been in his mind.

One was completed on July 1, 1875, and another a few days after, and, with these two instruments Mr. Bell and Mr. Watson experimented in July, and, at the end of that month, discontinued their experiments *without having heard a word of speech through the device, and even without Mr. Bell's having been able to hear a sound!*

Eighth.—That no further experiments were made till March 10, 1876, after the date of the first patent here in suit; but, on March 10, the experiments were resumed, *not with the instruments of July, 1875*, but with *a liquid transmitter* and *one of the old multiple-telegraph instruments as a receiver*, and then, for the first time was obtained, to use, Mr. Bell's words, "*intelligible articulation.*"

Reviewing these several facts, it will be noted that the alleged "harp apparatus" conception, and all that relates to it, must be laid out of consideration as utterly irrelevant and immaterial to this controversy. It is not the invention disclosed in Mr. Bell's patent of March 7, 1876, nor that of his patent of Jan. 30, 1877, but is of a different principle altogether, to wit, synthesis of sound by combining the effect of a series of armatures each having a fixed rate of vibration—a mere modification of Helmholtz's experiment.

It will also be noted that the experiment of May 4, 1875, with the piano strings, must be laid out of consideration, as it resulted unsuccessfully, and was not a telephone nor any part of a telephone nor was it intended as such. It was merely to test the correctness of something that Mr. Bell says *he had read*, viz: "that the resistance offered by a wire to the passage of an electrical current is effected by the tension of the wire"—the discovery of some prior investigator—and was done to increase Mr. Bell's stock of general electrical knowledge, of which he had confessed to Prof. Henry his great deficiency. We may, therefore, disregard all these matters as irrelevant, and confine our inquiries to the following points, viz:

First, the alleged inchoate mental conception, in the summer *or fall of 1874, of the possibility of employing a membrane apparatus for transmitting speech electrically.*

Second, the instruments made and tested in July, 1875, and the results of those tests.

Third, the accomplishment of "intelligible articulation" in the spring of 1876:—these being the only points of any materiality or pertinency to the discussion, as set forth either in Mr. Bell's sworn history, above quoted, or in the evidence submitted in this case on behalf of the complainants.

We shall discuss these three points in their order, but before entering upon such discussion it is proper to note (1) that *prior to June 2, 1875, Mr. Bell never made a telephone instrument or experiment,* his work being confined exclusively to his multiple and autograph telegraph inventions, and to his professional work as a teacher of the deaf. He testifies to this fact, in substance, throughout his deposition and sworn preliminary statements, but explicitly and pointedly in his answer to cross-interrogatory 342, C. Vol. 2, p. 1600, where he says:

> "*Cross-I. 342.*—From the summer of 1874, till at least as late as June 2, 1875, your experimental work was confined almost, if not quite, exclusively to your multiple telegraph inventions, was it not?
>
> "*Ans.*—Yes, excepting so far as my professional experiments in teaching correct articulation to deaf mutes and persons with defective speech was concerned. During the early part of the period referred to my professional experiments occupied most of my time."

In the next following answer he sets forth the different multiple telegraphs on which, during the period referred to, he applied for letters patent, and from which it appears that his attention must have been quite absorbed by the telegraph, to the exclusion of other electrical studies or work. In his letter of May 24, 1875, (C. Vol. 1, p. 132) he speaks of having given up his professional work and devoted himself exclusively to *telegraphy.* (2.) During the period prior to June 2, 1875, he was only *speculating* on the possibility of transmitting articulate speech electrically—he was not *working* on it. He seems to have repressed even his speculations on the subject in the latter part of the spring of 1875, for he says, in his letter of May 24, (C. Vol. 1, p. 133) "However, *this is kept in the background just now*, as every effort is to be made to complete the autograph arrangement, so as to have it used on some line." He was experimenting on the multiple telegraph on June 2, 1875, when he accidentally made the so-called "discovery" of that day.

Recurring now to the three material points of the discussion above referred to:—

First. The alleged inchoate mental conception, in the summer or fall of 1874, of the possibility of employing a membrane apparatus for transmitting speech.

It will be noticed that Mr. Bell, in his sworn preliminary statement (C. Exhibits, p. 1002) does not even pretend that this alleged conception was the conception of a complete apparatus, but, on the contrary, says: "I did not, at this time, devise *any method of combining a membrane with an armature*, or attempt to construct any apparatus upon the plans I had conceived." It was a mere transient speculation upon the possibility of using a membrane *somehow* in connection with an electro-magnet and an electric circuit, and was not worked out even mentally and speculatively.

It will further be noticed that, while not worked out even speculatively, it was instantly condemned by Mr. Bell himself as utterly impracticable and useless and not worth even a test or an experiment. He admits this in his preliminary statement, (C. Exhibits, p. 1002). Again in his testimony, (C. Vol. 1. 1, p. 121) where he says:—

"*Int. 42.* Did you, at that time, construct the apparatus described in your fortieth answer?

"*Ans.* I did not.

"*Int. 43.* Why not?

"*Ans.* Because I had the idea that the magneto-electric currents produced by the operation of the voice would be too feeble to produce practically useful results."

Again in his testimony, C. Vol. 2, top of page 1591: "As I have already explained, I had had the idea since the summer of 1874, that vibrations produced in this way would be of very slight amplitude, and that they might not prove sufficiently violent to produce audible effects that would prove practically useful, either for the purpose of the reproduction of articulate speech, or for the purposes of multiple telegraphy. The experiments described above (those of June 2, 1875,) convinced me that this was a mistake."

Again, referring to the same matter in his answer to cross-question 293, C. Vol. 2, p. 1577, he testifies as follows:—

"The chief doubt in my mind at that time was as to the practical value of the reproduced speech. I saw that while the reproduction of the original vibrations would, theoretically, be perfect, they would be copied in miniature—they would be, as it were, microscopic photographs of the originals. While we may not be able to see all the details of a microscopic photograph, we may be firmly convinced that they are all there, and that we have only to enlarge them in order to render them appreciable by the eye. In a similar manner, I was firmly convinced, in the summer of 1874, that articulate speech would be reproduced by the apparatus I had devised, but *I was doubtful whether the unassisted ear could perceive the vibrations as sound*, and *whether, if so, the minute details of the vibrations*, upon which depend the character or quality of the sounds produced, would be perceived by the sense of hearing."

In other words, he did not have the idea for a moment, that the slightest audible effects would be produced by his imaginary apparatus, and so he never gave the matter any further attention.

To realize how strong was his utter disbelief in the feasibility of the "plan," we have only to look at his situation, the means which he had at hand for testing the question as to whether audible effects would be produced by such an apparatus or not. The ease with which the experiment could be made—absolutely without cost—and the importance of making such test; gathering these facts from his own testimony, where they were wrung out of him on cross-examination; and it will be interesting to note how reluctantly he testifies, and how he endeavors to color the facts even to the extent of palpable misrepresentation, in order to avoid the force of the legal conclusions necessarily resulting from them. All this will be found in C. Vol. 2, pp. 1594 to 1608, answers 324 to 350. In answer 341, p. 1600, he admits that, for the purposes of reproducing articulate speech by electrical means, it was of great importance to have determined whether audible effects would or would not be produced through an electric circuit by vibrating a permanent magnet or inductive plate (armature) in front of an electro-magnet.

Here, then, was a powerful *motive*, constantly present, urging him on to make the experiment if his mind was in any *doubt* about the result.

Then he admits, in answer 330, 1595, that all the while he had in his possession the *instrumentalities* requisite for making the experiment. He had them in his possession from as early as November, 1873. This admission he repeats near the top of p. 1606, where he says: " It did not occur to me to try the experiments referred to in the question, *although I had the means at hand*, until the discovery of June 2, redirected my attention to the point inquired about."

" Redirected !" His mind had left the idea entirely, long before June 2, and had to be " redirected " to it.

Thus having from his own evidence established the facts that, if he was harboring his alleged conception at all between the summer of 1874 and June 2, 1875, and had even the slightest suspicion of its possessing any utility, he was under the influence of a most powerful motive to test the question, and had the means right at his hand for making the test at any time within those six or eight months, we summed the whole situation up in one question—cross-question 344, C. Vol. 2, pp. 1600, 1601—as follows: " *Cross-Q.* 344. Then the doubt which you speak of in your 340th answer was so strong and the hope so weak, that although the generation of undulatory currents in a circuit by the inductive energy of a vibrating magnet or plate in front of the pole of an electro-magnet suggested itself to your mind as early as July, 1874; and although for the purpose of reproducing articulate speech by electrical means it was of the greatest importance to determine whether electric undulations so caused in the line would produce sonorous vibrations at the receiving end or not; and, although you had in your possession all the instrumentalities necessary for the demonstration of that question; and, although having those instrumentalities the experiment was an exceedingly easy one to make; yet, from July, 1874, till June 2, 1875, you never made the experiment nor attempted to make it, nor attempted to ascertain whether your doubt was well founded or not, and the experiment of June 2, 1875, which finally resolved your doubt, was an experiment relating to the multiple telegraph, in which the resolving of your doubt was purely an accidental matter; am I correct?" *

Mr. Bell, when this interrogatory was put to him, realized the terrible force of the fact which it presented, and, although his reply occupies only five and one half printed pages, of which one page is mere quotation, yet it took him *twenty four hours* to complete it. It is a labored attempt at an apology; a plea that from July, 1874, to June 2, 1875, he was so driven with his professional work and his multiple telegraph inventions, that he had not the *time*, and so destitute that he had not the *money*, to make the experiment. The whole answer can be condensed into ten words;—"I was too busy and too poor to do it." And yet this was not true—he was neither too busy nor too poor, for having the instrumentalities already in his possession, he could, at any time in those eight or ten months, have made the experiment *in three minutes without the outlay of one penny of money!* These facts he is obliged to admit in the next three answers immediately following his labored apology, (answers, 345, 346, and 347, p. 1607,) and they completely destroy the whole attempted structure of excuse.

In the course of this labored but abortive attempt at excuse, how adoritly he weaves in the insinuation that he could not use the time and money of Messrs. Hubbard and Saunders for making said experiment, because he "was in honor pledged to" them to devote all his "spare time and thoughts to the development of multiple telegraphy" (p. 1601); he "felt it" his "duty to devote all" his "spare time and thoughts to the development of multiple telegraphy" (p. 1603); and (p. 1606); he "considered" his "legitimate work to be the development of multiple telegraphy"! *Now this excusatory insinuation is simply intended to mislead, and is not true in fact.*

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* Every statement of this interrogatory is absolutely true, on the complainants' evidence, and had been established by that evidence before we put this 344th cross-interrogatory to Mr. Bell. *He does not deny* any one of these statements, but, on the contrary, tacitly admits and tries to apologize for his inaction.

The experiment in question was equally as important for the multiple telegraph as for the telephone. *The idea was originally conceived for the multiple telegraph.* He tells us, C. Vol. 1, pp. 116, 117, that he first conceived, but never made, an imaginary apparatus for multiple telegraph purposes, which he illustrates by Fig. 7, p. 117; also (pp. 118, 119,) that the imaginary harp apparatus, illustrated in Fig. 8, p. 118, referring to which he says (C. Exhibits, p. 1002), "which I had devised with special reference to multiple telegraphy," followed the conception shown in Fig. 7, p. 117, and, elsewhere, that the imaginary membrane apparatus conception of 1874 grew out of the equally imaginary "harp" conception. All three of these inchoate conceptions (including that of Fig. 7, p. 117, which is an organ reed set in an enclosing frame and capable of *very powerful vibrations* by means of air currents produced mechanically, as in an organ), he at once condemned for one and the same reason, to wit, because they would none of them give currents sufficiently strong to produce appreciable or audible results. To discover that they *would* give currents strong enough to produce such results was, therefore, equally as important for his multiple telegraph inventions as for his alledged telephone investigations, and if he was "in honor pledged" to develope the multiple telegraph, he was thereby in honor pledged to make some experiments to settle this question, and, if necessary, to use the time and money of Messrs. Hubbard and Sanders for the purpose; yet he never did it, nor attempted to do it, till June 2, 1875, simply because he had discarded and abandoned the whole idea as chimerical and worthless.

That he did abandon all three of the said alleged "plans," to wit, that illustrated in his fig. 7, p. 117, that illustrated in his fig. 8, p. 118, and the membrane plan, for one and the same reason, viz., their supposed impracticability, appears from the following:—The plan shown in Fig. 7, p. 117, is the same plan shown in Fig. 15 of drawings attached to his preliminary statement in the harmonic telegraph interference, C. Exhibits, p. 994; and the "harp" plan shown in Fig. 8, p. 118, is the same plan shown in Fig. 16 of said drawings, C. Exhibits, p. 995. Referring to these two plans, both devised "with special reference to multiple telegraphy," he specifically admits that he abandoned them, in his said preliminary statement, C. Exhibits, p. 996, where his language is as follows:—

"Fearing that ridicule would be attached to the idea of transmitting vocal sounds telephonically, especially by those who were unacquainted with Helmholtz' experiments, I said little or nothing of this plan."—(the 'harp' plan). "Indeed, reflection *convinced* me that, however feasible the scheme looked upon paper *it was impracticable*, as the induced currents would be far too feeble to overcome any great resistance. *For the same reason the plan shown in Fig. 15*" (the plan of Fig. 7, page 117, C. Vol. 1), "*seemed impracticable save in theory;* and *I began to look about for some other method* of inducing alternate positive and negative impulses which should succeed each other at equal intervals of time; and at last hit upon the plan of making and breaking contact by means of a revolving cylinder, as shown in Fig. 17.

Again, in his other preliminary statement, viz., that of the telephone interference, (C. Exhibits, p. 997) he substantially repeats the statement. Commencing with the words, "In developing my plan of multiple telegraphy" (near the bottom of p. 998) he occupies nearly a page in explaining the conception shown in Fig. 7 of C. Vol. 1. p. 117. Then, beginning with the words, "I then conceived the plan of attaching a number of springs," (near the bottom of p. 999) he describes the "harp" conception shown in Fig. 8, C. Vol. 1, p. 118, and, (from the middle of p. 1000 to the middle of p. 1001) explains how, after he had conceived this plan for multiple telegraph purposes, it occurred to him that by increasing the number of springs or armatures so as to comprehend the whole scale of musical sounds audible to the human ear, the apparatus might possibly reproduce consonantal sounds as well as the vowel sounds of Helmholtz. Then, in concluding the matter of these "plans," (p. 1002) he admits again that he considered them impracticable, for the reason above stated, and says: "I *therefore* turned my attention to *other modes of working out my plan of multiple telegraphy*, which I was thoroughly bent upon reducing to practice immediately."

His pretense, in cross-answer 344, that he did not make any experiment to test the matter until it was accidentally done on June 2, 1875, because he was "in honor pledged to" Messrs. Hubbard and Sanders not to use their time and money except for multiple telegraph matters, is therefore a sham. The question to be determined pertained directly and particularly to multiple telegraph matters, and both of the "plans," Fig. 7, p. 117, and Fig. 8, p. 118, C. Vol. 1, which he abandoned without making a model, drawing, or experiment, by reason of his utter disbelief in their producing an audible sound, were plans admitted to have been "devised" by him "for multiple telegraph purposes."

Moreover, to still further expose this shallow pretense that his obligation to Messrs. Hubbard and Sanders to complete the multiple telegraph inventions prevented his making any effort to determine the question above referred to, look at his acts on June 2, 1875, and for two months thereafter. The crucial experiment which he had refused to make because "convinced" that it would be useless, had been made at last, by mere accident. From that moment, did he have any scruples about following it up by the use of Messrs. Hubbard and Sanders' time and money? Not at all. He set Watson immediately at work, in their time and with their money, to make and experiment with instruments with which to endeavor to get articulate speech.

"*Cross-Q. 372.* Who paid the expense of having the instruments and experiments made between the 2d of June and the end of July, 1875, referred to in your examination-in-chief, interrogatories, 74–93?

Ans. Mr. Hubbard and Mr. Sanders."

(Bell, C. Vol. 2, p. 1614.)

When he applied for his patent of March 7, 1876, which he now says is for the speaking telephone, he had no scruples about burdening the same gentlemen with the expense o procuring it.

"*Cross-Q. 442.* Who paid the expense of procuring your patent of March 7, 1876?

"*Ans.* I do not know; I presume *Mr. Sanders and Mr. Hubbard.*"

(Bell, C. Vol. 2, p. 1643.)

And he says, (2d p. 1613, Ans. 371) "My understanding *always* was that the speaking telephone was included in the inventions that belonged to Messrs. Hubbard and Sanders from the autumn of 1874."

In addition to all this, let it be always remembered that the experiment *required neither time nor money,* as he is obliged to admit on p. 1607.

Still further, in his answer 344 he gives the court to understand that his obligation to Messrs. Hubbard and Sanders prevented him from using the time to make this very important experiment; *but it appears that he found time to make other experiments* which *he says* had relation to the transmission of sound or speech. He found time, in March, 1875, to spend a portion of two days with Prof. Henry, in Washington, and to explain the empty coil experiment (which he says was new and surprising to Prof. Henry, but which was an old experiment of De la Rives (see Ans. 248, C. Vol. 1, p. 194); and he found time, in May, 1875, to make the piano-string experiment (C. Vol. 1, p. 130, 131, &c.), to ascertain whether something which he had read was correct or not—each of these experiments requiring much more time and involving much more trouble than the accidental experiment of June 2, 1875.

It is, therefore, not to be believed that he neglected this great and convincing electrical experiment from the summer of 1874, till June 2, 1875, simply because he had not the time or money to make it and did not feel at liberty to use Messrs. Hubbard and Sanders' time for the purpose.

The pretense is "too thin" for credibility, and is too thoroughly contradicted by his own acts and circumstances at the time.

Again, and lastly, even admitting, for the purpose of the argument, that Mr. Bell did have, in 1874, a crude and inchoate conception of a membrane and reed armature in connection with an electro-magnet, it is altogether probable that this conception, like those of Fig. 7, p. 117, and Fig. 8, 118, C. Vol. 1, was for multiple telegraph purposes. Facts sustaining this theory are as follows:

1. Bell did, in the fall of 1874, contemplate *some kind of a stretched membrane armature* for his multiple telegraph, and mentioned it in his caveat prepared for filing that fall. This caveat is referred to in his testimony, C. Vol. 2, p. 1602, and p. 1656, Ans 490, where it was offered in evidence. It is found in C. Exhibits, pp. 857 to 868. By reference to it, C. Exhibits, p. 858, it will be seen that it described his proposed multiple telegraph transmitting instruments as follows:

"These consist of *devices for opening and closing the electrical circuit a definite number of times per second.* This may be accomplished by the employment of *vibrating armatures* (consisting of metallic plates or rods, wires, *stretched membranes*, tuning-forks, &c.) revolving cylinders, stringed or wind musical instruments, or by the use of other contrivances. The intermittent current may also be induced upon the line-wire by means of a *permanent magnet* in place of a battery. And, in the same caveat. (Id. p. 862.) "The said *armatures* may be made of any material or materials whatever, so long as they are capable of being set in vibration *by electro magnets.* They may consist of tuning-forks, rods, plates, strings or *membranes*, or may take any form capable of *definite* vibration." It will be observed that the description, C. Exhibits, p. 858, makes the proposed *stretched membrane* do duty as *one form of vibrating armature*, and in the plainest terms distinguishes it from "stringed or wind musical instruments, which are not catalogued as a form of vibrating armature, but, on the other hand, as a distinct *alternative or substitute* for all forms of armature as well as for "revolving cylinders."

This "stretched membrane" "armature" "capable of being set in vibration by electro-magnets," for multiple telegraph purposes was, therefore, probably the thing that Mr. Bell had in mind in 1874, and which it is now sought to convert into a telephone conception.

The story that it was then thought of as a telephone conception rests upon the mere statement of Mr. Bell and Dr. Blake. Both of these witnesses are proved to be unreliable: Bell is shown to be unreliable by his answer 374, on this very subject, C. Vol. 2, p. 1614.

"Did you, prior to June 2, 1872, *contemplate* the use of a membrane in connection with the vibrating reed in your multiple telegraph instrument, *or any of them?*

"*Ans: I don't think so.* I had in view the possibility of using stretched membranes in multiple telegraph apparatus of some kind, but so far as my recollection goes I simply had the idea of utilizing some of the ordinary musical instruments in which stretched membranes are used. I of course contemplated the use of a membrane in connection with a vibrating reed similar to that in my multiple telegraph, but *not clamped so as to give it a definite pitch;* for the purposes of the speaking telephone as early as the summer of 1874. I understood your question to refer to the use of this combination in the multiple telegraph. *It was never intended for this use,* although it might be possible to make some application of this kind."

Yet the caveat, written in the fall of 1874, shows conclusively that Mr. Bell's testimony is wrong—that it *was* contemplated for multiple telegraph purposes; that the reed *was* to be "clamped so as to give it a definite pitch," "opening and closing the electrical circuit a definite number of times per second," (p. 858) and "capable of definite vibration" (p. 862); and that it was *not* one of the applications of stringed instruments, but the application of a "vibrating armature" as distinguished from the other alternative ideas of the stringed instruments and the revolving cylinders. Mr. Bell's testimony is, therefore, contradicted by his own caveat, as to the contemplated use of this alleged membrane conception of 1874.

And it is contradicted by his sworn preliminary statement made in 1878 in the Telephone Interference, C. Exhibits, p. 1002. He there states under oath, "I did not, at this time, devise any method of combining a membrane with an armature," &c., whereas, in his answer 374, C. Vol. 2, p. 1614, given in 1883, five years afterwards, he is ready to testify that he did devise such a method, and to describe even the details of the method devised—the membrane he here says, was to be combined with a vibrating reed similar to that in his multiple telegraph, and the reed was not to be clamped so as to give it a definite pitch.

These contradictions, in 1883, of facts established by his own evidence in 1874 and 1878, show that we can not rely upon his testimony as to what he did or did not conceive mentally in 1874.

As for Dr. Blake, his own deposition, carefully read, shows him to be an exceedingly "swift" witness in regard to whose statements large allowances should be made for partisan or personal bias. He is ready to swear (Ans. 50 C. Vol. 1. p. 344) that Bell expressed an opinion which Bell, himself, admits he did not entertain, to wit, that the currents generated by the vibration of an armature in front of the pole of an electro magnet would be sufficient to reproduce in a receiving reed, the same vibrations imparted to the transmitting reed. He is ready to swear that, though he is utterly unfamiliar, practically, with electrical science, (Id p. 345, Ans. 52) yet he had no doubt about the strength of such currents being sufficient for the purpose, (Id Ans. 51). He even makes the extraordinary and incredible statement that, after the interview, and as a result of it, he lost all further interest in Bell's investigations because he saw that he (Bell) had attained the result which was sought, to wit, "the transmission of articulate speech electrically" (Id p. 346, Ans. 61, 62, 65,) although Bell had not made nor attempted an experiment towards that result and did not himself believe such currents practical for any purpose whatever. He is ready to describe in detail that Bell contempleted "the attachment of a metal reed to a membrane," (Id Ans. 5, 46, 69,) although Bell says in his preliminary statement (C. exhibits, p. 1002) that he did not devise any methed of combining a membrane with an armature. He swears, (Ans. 79) that he first described the proposed instrument to Mr. Bell, then denies it in Ans. 80, then admits it in Ans. 82. Having sworn, (Ans. 61), that Bell had apparently attained the solution of the problem, and also (Ans. 51), that he, (Blake) had no doubt about the strength of electrical currents so generated, he proceeded to tell us, (Ans. 86,) that he *did* have a very important doubt about the practicability of the proposed apparatus, to wit, he "doubted if a plane membrane would reproduce with sufficient accuracy the sound waves resulting from the human voice!" And he (Ans. 56, 90) proposed a curved membrane, as, for instance, the drum membrane of the human ear or the ear of some animal, having its centre depressed below the level of its periphery. He says, in Ans. 89, that he and Bell discussed "pretty thoroughly" the reasons for preferring the curved membrane, and, in Ans. 91, that they discussed said reasons "very briefly," and in Ans. 93, that they did not discuss the reasons at all, but simply talked of the fact:

"We did not discuss the reason why, the talk was simply of the fact."

He produces four sketches, *on one sheet of paper*, all relating to *the multiple telegraph* (even if we include Fig. 4, the harp apparatus "which," Mr. Bell says (C. Exhibits p. 1002) "I had devised with special reference to multiple telegraphy," and in Ans. 49, C. Vol. 1, pp. 122, 123, "I had conceived for the transmission of vocal utterance electrically" and he states (Ans. 4 to 14, pp. 339, 340, C. Vol. 1.) that other sketches were made at the time and were subsequently given to Mr. Bell at his request—as many as three or four sheets of sketches, of which Mr. Bell sees fit to put in evidence only this one sheet—but he does not pretend that even a loose sketch of this alleged membrane apparatus was made—it was all talk, "mere words," always easily capable of misrecollection, misconstruction and misrepresentation.

He states (Ans. 7, C. Vol. 1, p. 338; Ans. 56, p. 345) that the reason why this proposed "human ear," or membrane apparatus was not made and tested was "because we did not wish to dismount the human drum membrane which we were using as a phonautograph;" Mr. Bell, however, (Id. p. 121, Ans. 43) states that the reason was "Because I had the idea that the magneto-electric currents produced by the operation of the voice would be too feeble to produce practically useful results."

Bell and Blake thus contradict each other, again and again, as to material facts, and Bell contradicts his own caveat made at the time and which proves conclusively that in October, 1874, (C. Vol. 2, p. 1602) the time of the Bell-Blake interview (C. Vol. 1, p. 335, Ans. 2, p. 343, Ans. 40) Bell was indeed contemplating the use of such a membrane and armature, *but for the purpose of making and breaking the circuit a definite number of times per second, for multiple telegraph purposes.*

At the best, it was, to use Dr. Blake's own description of it in Ans. 32, p. 341, C. Vol. 1, merely "a desultory conversation in which other points relating to acoustics were discussed;" The proofs of the alleged "conception" are conflicting and contradictory. The conception itself is uncertain and, from Bell's statement (C. Exhibits p. 1002), that he "*did not devise any method of combining a membrane with an armature,*" it was confessedly inchoate and incomplete; it was never followed up with a single experiment or test or even an attempt at one; and it was abandoned at the time as "impracticable" and useless.

And what was Mr. Bell doing from October, 1874, till June 2, 1875, so far as his hope of transmitting speech electrically was concerned? The question can be answered in his own words—not experimenting, not working, but "dreaming." "During this period it must not be supposed that I had forgotten or neglected my ideas concerning the speaking telephone. Although, as stated above, I felt it my duty to devote all my spare time and thoughts to the development of multiple telegraphy, I could not help *thinking* and *dreaming* of the speaking telephone. It was constantly in my mind." (C. Vol. 2, p. 1603).—He was asleep, so far as any development of the telephone was concerned, and it was the subject only of dreams.

The law, however, requires not sleep nor dreams, where the inventor seeks to carry the date of his invention back in point of time as against other inventors; but it requires diligence and *work*. The great chasm between the summer of 1874, and the second day of June, 1875, can not be bridged by *dreams*.

"A patentee whose patent is assailed upon the ground of want of novelty, may show, by sketches and drawings, the date of his inceptive invention, and *if he has exercised reasonable diligence* in 'perfecting and adapting' it, its protection will be carried back to such date; and in a race of diligence between rival inventors, the one who first perfects an invention and embodies it in a distinct form, is entitled to priority. * * * * Independent of this provision" (Sect. 15 of the Act of 1836) "he is entitled to priority of right to a patent who first reduces his invention to a fixed, positive form adapted to practical use."

Reeves vs. *The Keystone Bridge Co.*, 4 Fish. 462 (McKennan, J., 1877.)

Mr. Bell produces no "sketches" or "drawings," made in 1874 to represent his alleged membrane conception, and no diligence whatever—not a solitary act—between that date and June 2, 1875. On the contrary, he shows immediate *abandonment of the alleged idea*, because it was deemed by him to be impracticable.

"In considering this question of reasonable diligence, it is not sufficient to answer that he used diligence in relation to some *other* invention or machine. The question is, Did he use diligence in perfecting that invention which he has made of the feeding apparatus?"

Johnson vs. *Root*, 1 Fish, 368 (Sprague, J., 1858.)

"The date of the invention is the date of the discovery of the principle involved and the *attempt to embody that in some machine.*"

Colt vs. *Mass. Arms Co.*, 1 Fish. 120 (Woodbury, J. 1851).

Along in May, 1875, when his alleged membrane conception had been for months abandoned as worthless, Mr. Bell was working with increased energy on his multiple and autograph telegraph inventions. In his letter of May 24, 1875, to his parents, (C. Vol. 1, pp. 132—134) he uses this expression: "Since I gave up my professional work and devoted myself *exclusively to telegraphy*." He was giving little or no attention to the transmission of speech, even in his dreams. "*This is kept in the background just now*, as every effort is to be made to complete the autograph arrangement so as to have it used on some line." (Id. p. 133.)

On the well settled principles of law above stated, Mr. Bell is not entitled to carry the date of his invention back to 1874; and his alleged inchoate and confessedly incomplete speculations of that date may be dismissed from further consideration, on the ground that they are utterly immaterial and irrelevant to the question at issue.

Let us, then, turn to the second and third points under discussion.

Second. The instruments made and tested in July, 1875, and the results of those tests.

Third. The accomplishment of intelligible articulation in the spring of 1876.

The accidental discovery of June 2, 1875, was simply the discovery of an electrical fact and not of the speaking telephone, viz., that the vibration of an inductive reed in front of the pole of an electro-magnet in a circuit, will produce currents of sufficient strength on the line to vibrate audibly another similar reed, similarly arranged, at the other end of the line. (C. Vol. 2, Ans. 324, p. 1594).

This discovery was made with multiple telegraph instruments such as are shown in Figs. 5 and 6 of his patent of March 7, 1876, (C. Vol. 2, pp. 1589, 1590; C. Exhibits, 1007), and which were in substance the same as the instruments shown in Fig. 3, p. 111, C. Vol. 1, which he had had in his possession from November, 1873 (Ans. 330, p. 1595,

C. Vol. 2; Ans. 18; pp. 110, 111, C. Vol. 1), but had never knowingly combined together on one line before (C. Vol. 2, Ans. 325 to 330, pp. 1594, 1595).

Having made this "discovery," Mr. Bell (in strange forgetfulness of his obligations of "honor" to Messrs. Hubbard and Sanders), set Watson at work to construct instruments with which to test the possibility of transmitting speech. And here, again, his conflicting statements show the unreliability of his testimony. In his preliminary statement (C. Exhibits, p. 1008) he says he gave the order to Watson "on the same day or *shortly after;*" in his testimony five years later than his preliminary statement, his evolutionary memory had so developed that he is prepared to state (C. Vol. 1, 139), that the order was given "immediately upon this same 2d of June, 1875." The instrument was made soon afterwards. In his preliminary statement (C. Exhibits, p. 1008), he says: "So far as I can recollect, it was not until the 1st day of July, 1875, that we were able to get the instrument in condition for trial." In his testimony (C. Vol. 1 pp. 140, 141), he says it was during the month of June, 1875, that the experiment with it was made. The experiment was tried as soon as the first instrument was made, for he says (C. Vol. 1, pp. 140, Ans. 77): "I was anxious to try the instrument at once, and could not wait to have the duplicate receiver made; so, immediately upon its construction, I attempted to use it *with one of my harmonic receivers.*"

He thinks that at these tests a battery was used in line, because the current employed was so powerful as to frequently tear the armature from the membrane (Ans. 77, 78, C. Vol. 1, pp. 140, 141). Of the results, he says, "I do not remember definitely what the results were, excepting that I was encouraged by them to *reconstruct the instrument* with a lighter armature" (Id. Ans. 77). This reconstructed instrument was then tested in the same manner as the other had been, and the results are stated in his letter of July 1, 1875 (C. Vol. 1, p. 143) as simply enabling him to distinguish the varying *pitch* of the voice—a result long before

Colt vs. *Mass. Arms Co.*, 1 Fish. 120 (Woodbury, J. 1851).

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Third. The accomplishment of intelligible articulation in the spring of 1876.

The accidental discovery of June 2, 1875, was simply the discovery of an electrical fact and not of the speaking telephone, viz., that the vibration of an inductive reed in front of the pole of an electro-magnet in a circuit, will produce currents of sufficient strength on the line to vibrate audibly another similar reed, similarly arranged, at the other end of the line. (C. Vol. 2, Ans. 324, p. 1594).

This discovery was made with multiple telegraph instruments such as are shown in Figs. 5 and 6 of his patent of March 7, 1876, (C. Vol. 2, pp. 1589, 1590; C. Exhibits, 1007), and which were in substance the same as the instruments shown in Fig. 3, p. 111, C. Vol. 1, which he had had in his possession from November, 1873 (Ans. 330, p. 1595,

C. Vol. 2; Ans. 18; pp. 110, 111, C. Vol. 1), but had never knowingly combined together on one line before (C. Vol. 2, Ans. 325 to 330, pp. 1594, 1595).

Having made this "discovery," Mr. Bell (in strange forgetfulness of his obligations of "honor" to Messrs. Hubbard and Sanders), set Watson at work to construct instruments with which to test the possibility of transmitting speech. And here, again, his conflicting statements show the unreliability of his testimony. In his preliminary statement (C. Exhibits, p. 1008) he says he gave the order to Watson "on the same day or *shortly after;*" in his testimony five years later than his preliminary statement, his evolutionary memory had so developed that he is prepared to state (C. Vol. 1, 139), that the order was given "immediately upon this same 2d of June, 1875." The instrument was made soon afterwards. In his preliminary statement (C. Exhibits, p. 1008), he says: "So far as I can recollect, it was not until the 1st day of July, 1875, that we were able to get the instrument in condition for trial." In his testimony (C. Vol. 1 pp. 140, 141), he says it was during the month of June, 1875, that the experiment with it was made. The experiment was tried as soon as the first instrument was made, for he says (C. Vol. 1, pp. 140, Ans. 77): "I was anxious to try the instrument at once, and could not wait to have the duplicate receiver made; so, immediately upon its construction, I attempted to use it *with one of my harmonic receivers.*"

He thinks that at these tests a battery was used in line, because the current employed was so powerful as to frequently tear the armature from the membrane (Ans. 77, 78, C. Vol. 1, pp. 140, 141). Of the results, he says, "I do not remember definitely what the results were, excepting that I was encouraged by them to *reconstruct the instrument* with a lighter armature" (Id. Ans. 77). This reconstructed instrument was then tested in the same manner as the other had been, and the results are stated in his letter of July 1, 1875 (C. Vol. 1, p. 143) as simply enabling him to distinguish the varying *pitch* of the voice--a result long before that time attained by the Reis Telephone with which Mr. Bell was already familiar, and which he testifies (Ans. 435, 437, 438, p. 1642, C. Vol. 2) is not capable of transmitting articulate speech.

On July 1, 1875, Mr. Bell gave orders to Watson to construct a second instrument like that already made, and it was done within a day or two thereafter (C. Vol. 1, p. 144, Ans. 84). The two instruments were then put in line and tested, in July, 1875, one as a transmitter and the other as a receiver.

At the end of July, 1875, Mr. Bell discharged Watson, who had been in his employ since the beginning of 1875, and made no more electrical experiments till after the issue of his patent (Watson, C. Vol. 1, p. 316, Ans. 179; Bell, C. Vol. 2, p. 1581, last sentence of Ans: 296, Ans. 297; Id. p. 1666, Ans. 534). When his patent issued, the whole matter stood just where it was left at the end of July, 1875:—

> "*Cross-Q.* 283. Am I to understand you that when your patent of March 7, 1876, issued, you had attained no better results than the results which you attained in June and July, 1875? And if that is not your meaning, please explain more fully what you meant by the last part of your last answer?
>
> "*Ans. That is my meaning.* (Bell, C. Vol. 2, p. 1575, Ans. 283.)"

Now, then, as the first membrane instrument was "not in condition for trial till the first day of July, 1875," and as the second membrane instrument was not made till a few days after that, and as it took the two instruments in circuit to complete the apparatus, and as the experiments ceased at the end of July, 1875, and were not resumed until after the patent issued on March 7, 1876, and as he had never attained any better results up to the date of his patent than he attained in June and July, 1875, it is only necessary to inquire into the results of July, 1875. What were they—did he achieve the transmission and reproduction of articulate speech or not? The answer is, emphatically, *he did not.*

It is fortunate that we have, on this point, *the most abso-*

lutely conclusive record evidence, made by Mr. Bell at the time, and at various times before he was subjected to great temptation to exaggerate the facts, and while his mind was unbiased and his memory fresh; otherwise his present testimony, with his wonderful skill in coloring facts by a mere turn of expression, might mislead the Court. He *now* endeavors to have the Court understand that speech was actually heard in July, 1875:—

"*Cross-Q. 281.* When did you first succeed in getting your electric speaking telephone to transmit vocal speech so that it was heard and understood from the receiver?

"*Answer.* Somewhere about June or July, 1875. The articulation of the instrument was *not entirely intelligible at this time* (*!*), but I feel perfectly sure that many words were understood, although *I can not recall the details of any experiment made at this time when the words were fully understood.*

" *Cross-Q. 282.* Can you state the circumstances under which any experiment was made in June or July, 1875, at which *any word* was heard and understood through the instrument?

"*Answer. My recollection of these experiments is very vague,* but I remember distinctly that on one occasion I was speaking to a membrane telephone (of the form marked in this case as telephone of 1875) in the top part of Mr. Williams' factory, 109 Court street, Boston, while Mr. Thomas Watson was listening to an instrument in the workshop below. I was interrupted by the sudden appearance of Mr. Watson, who had rushed up stairs in a state of great excitement, and who declared that he had heard vocal sounds proceed from the instrument to which he had been listening, and that he could almost understand what was said. We then changed places, but I was unable to hear anything on that occasion. This inability I attributed at the time to the noise of the machinery in the workshop, and to the fact that Mr. Watson was unable to throw out his voice with sufficient force to set the membrane of his telephone into good vibration. I have a general recollection that numerous similar experiments were made during June and July, and that I, myself, obtained audible results. It is my impression that a few common words or sentences were occasionally understood, but I can not give the details of any particular experiment in which this was the case. I only remember that the results were such as to lead me to the firm conviction that the speaking-telephone was a *fait accompli.* In consequence of this I took out a patent for the speaking telephone without waiting to obtain better results.

"*Cross-Q. 283.* Am I to understand you that when your patent of March 7, 1876, issued, you had obtained no better results than the results which you attained in June and July, 1875? And if that is not your meaning, please explain more fully what you mean by the last part of your last answer.

"*Ans.* That is my meaning.

"*Cross-Q. 284.* Did Mr. Watson assist you in all your telephone experiments in June and July, 1875?

"*Ans.* He did.

"*Cross-Q. 285.* In the experiment to which you referred in answer to cross-question 282, when Mr. Watson interrupted you by rushing up and announcing that he had heard vocal sounds, he also informed you that he could not make out through the instrument what you said, did he not?

"*Ans.* He did; he said "he could almost understand what I said.

"*Cross-Q. 286.* He did not state any word that he thought he had heard, did he?

"*Ans.* I don't remember; I can not recall the experiment in any detail; I simply have the general remembrance of the excitement which he manifested, and of my disappointment at not being able to hear what he had.

"*Cross-Q. 287.* From his excitement I should judge that that experiment had produced better results than any prior experiment; is that your understanding?

"*Ans.* It may be so.

"*Cross-Q. 288.* When you exchanged places with him during that experiment you were not able to understand any words through the telephone, were you?

"*Ans.* No.

"*Cross-Q. 289.* And if I understand you correctly you were also disappointed in not being able to personally verify Mr. Watson's statement as to the result obtained. Am I correct?

"*Ans.* Yes, in regard to that experiment.

"*Cross-Q. 290.* Do you remember any other experiment which you made between that time and the issue of your patent of March 7, 1876, in operating, or attempting to operate, speaking telephones?

"*Ans.* I remember that I made a number of experiments during June and July, the details of which I have forgotten.

"*Cross-Q. 291.* Then your memory of that particular experiment, in which Mr. Watson rushed up stairs and made the announcement above referred to, is more distinct than your memory of any other experiment made after that and prior to March 6, 1876, is it?

"*Ans.* Much more distinct than any single experiment made between those dates. While I can not recall with any distinctness the details of any *particular experiment*, I do have a very clear recollection of the general results of them all. I felt convinced that I had solved the problem of the reproduction of speech by electrical means.

To say that this testimony is highly colored is, in view of the facts proved in this case, inadequate to the subject—it is essentially untrue.

It is proved by Mr. Bell's own writing at the time, that he did not get speech in 1875, and that when he ceased his experiments at the end of July, his mind was simply in this condition, to-wit: *that he had discovered a principle, namely, the undulatory magneto electric current,* which he thought would be necessarily used in a speaking telephone should such an apparatus ever be invented by anybody, but that the had not devised means for utilizing that principle on telegraph lines.

Only fourteen days after the cessation of his experiments and the discharge of Watson—while the matter was perfectly fresh in his mind—he wrote a letter to his financial backer and prospective father-in-law, Gardiner G. Hubbard, (C. Vol. 2, p. 1675) of which the following is a copy, the italics being ours:

SALEM, MASS, August 14th, 1875.

DEAR MR. HUBBARD:

"On glancing back over the line of electrical experiments, I recognize that the discovery of a *magneto electric current generated by the vibration of the armature of an electro magnet in front of one of the poles,* is the most important point yet reached. *I believe that it is the key* to still greater things. The effects produced, though slight in themselves, appear to me so great in proportion to their cause, *that I feel sure that the future will discover means of utilizing currents obtained in* *this way on actual telegraph lines.* So important does it seem to me to protect the idea that I think some steps should be taken immediately towards obtaining a *caveat*, or patent *for the use of a magneto electric current*, whether obtained in the way stated above (by the vibration of permanent magnets in front of electro magnets) or in any other way. I should wish to protect it specially as a means of transmitting simultaneously musical notes differing in *intensity* as well as in pitch. I can see clearly that *the magneto electric current* will not only permit of the actual copying of *spoken utterance*, but of the simultaneous transmission of any number of musical notes (hence messages) without confusion.

"The more I think of it the more I see that the method of making and breaking contact so many times per second, is only the *first stage* in the development of the idea.

"When we can create a pulsatory action of the current, which is the *exact equivalent* of the aerial impulses, we shall certainly obtain exactly similar results. *Any number of sounds* can travel through the same air without confusion and any number should pass along the same wire.

"It should even be possible for a number of spoken messages to traverse the same circuit simultaneously, for an attentive ear can distinguish one voice from another, although a number are speaking together.

"Don't you think it would be well to take out a *caveat* for the use of *the magneto-electric current? In its present undeveloped state*, it might be unwise to let Gray know anything about it, unless indeed, we could secure the *principle* of it in a patent."

Yours Respectfully,
A. GRAHAM BELL.

GARDINER G. HUBBARD, ESQ.,
Cambridge.

This letter is conclusive evidence that, in Mr. Bell's belief at that time, the speaking telephone had not been invented, but remained for "THE FUTURE" to discover. All he could say was, that he felt sure that the future would discover it. His language concerning its discovery is all in the future tense:

"I believe it is the key to *still greater things:* I feel sure that *the future will discover* means for utilizing currents obtained in this way on actual telegraph lines; *when we can* create a pulsatory action of the current which is the exact equivalent of aerial impulses, *we shall* certainly obtain exactly similar results; *in its present undeveloped state*, it might be unwise to let Gray know anything about it, unless indeed we could secure the *principle* of it in a patent," etc., etc. "So important does it seem to me to protect *the idea*, that I think some steps should be taken immediately *towards obtaining a caveat* or patent *for the use of a magneto electric current*," etc.

This is the language of a man who thought he had discovered an underlying principle, but had not discovered or invented the means for applying it. If he had obtained even a single word of articulate speech in his July experiments, he would have known positively that he had already invented the "means for utilizing" these currents; and how different his language concerning it would have been! How swift he would have been to proclaim the great fact to Mr. Hubbard, and to base his conclusions upon it!

But we have still more conclusive record evidence upon the point: On the 28th day of December, 1875, he had his interview with Mr. George Brown, at Toronto, Canada, for the purpose of securing his pecuniary assistance in taking out patents in England on all his electrical inventions; and, in that interview, he informed Mr. Brown of his July experiments and their results. He was, of course, under strong pressure to represent these results to Mr. Brown as favorably as possible. He drew a sketch of his July instruments exactly like Fig. 7 of his patent*, which figure is now relied upon by the complainants as showing the speaking telephone, and he wrote under it, in his own handwriting, these words:

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* The sketches shown to Mr. Brown, December 28, 1875, and the figure 7 of Mr. Bell's patent were both mere electrical diagrams, and not actual pictures of any apparatus. Watson (C. Vol. 1, pp. 324–5. Ans. 232, 23[illegible], 240,) says they are diagrams of the instruments made in June and July, 1875. Bell confirms this in his answers 129, C. Vol. 1, p. 158; 395, C. Vol. 2, p. 1620; 494, Id. pp. 1657, 1658. He says, also, in answer 608, Id. p. 1696, that "an electrical diagram" is "a diagram that would illustrate the general electrical arrangements described in the specification, and that did not profess to be exact drawings of the apparatus, *or even to show many of the mechanical details of construction.*" In his answer 392, same page, he says such diagrams "*do not pretend to show the full construction of the apparatus they illustrate.* In his answers 259, 260, 261, C. Vol. 1, p. 198, Mr. Bell explains wherein these diagrams do not exactly represent the instruments tested in June and July, 1875, although intended as diagrams of those instruments.

"*First attempt to transmit the human voice. The varying pitch of the voice could be discriminated, but not the quality. A sort of muttering effect was perceived at the receiving end when a person talked very loudly at the other end.*"

When Mr. Bell wrote, on that day, that the varying pitch of the voice could be discriminated, "but not the quality," he wrote, in effect, that it would not transmit speech. He knew perfectly well from his studies of Helmholz's investigations that the transmission of "*quality*" meant the transmission of *speech*.

"*Cross-Q 440.* Is any telephone apparatus which will not reproduce quality capable of use as a speaking telephone?

"*Ans.*—Certainly not. (Bell C. vol. 2, p. 1643.)

"*Cross-Q 52.* And, conversely, an apparatus which would not transmit and reproduce quality could not transmit and reproduce articulate speech; is not that true?

"*Ans.* It is true, recollecting, of course, that absolute perfection in the transmission of quality is not necessary for the reproduction of speech, but that the quality must be reproduced with sufficient exactness to enable one to recognize the speech transmitted." (Cross, C. Vol. 2, p. 1731.)

The complainants' other expert, Mr. Frank L. Pope, testified as follows.

Ques. Would an apparatus which would only accomplish what Mr. Bell himself stated on the 28th of December, 1875, to be true of the apparatus then represented, be of any practical utility or use for the purposes of a speaking telephone, or for the transmission of speech?

Ans. I don't think it would. (C. Vol. 2, p. 1412, Ans. 234.)

In producing "pitch" but not "quality," Bell, up to the date of his 1876 patent, had accomplished nothing more than Reis had done years before:—

"*Cross-Q. 437.* The Reis transmitter is not capable of transmitting articulate speech, is it?

"*Ans.* Certainly not.

"*Cross-Q. 438.* What characteristic of sound do you understand the Reis Telephone to transmit and reproduce?

"*Ans.* I understand that the Reis receiver will produce a sound whose pitch or "frequency" corresponds to the frequency of the interruption of the current caused by the vibration of the Reis transmitter.

"*Cross-Q. 439.* That is, it will reproduce pitch, but not loudness or quality; is that the fact?

"*Ans.* I believe so."

(Bell, C. Vol. 2, pp. 1642, 1643.)

In fact, Bell had not, up to this time, accomplished so much as Reis had accomplished more than fourteen years previously. In his paper published in Germany in 1861 (C. Exhibits, pp. 1039 to 1045), Reis described (pp. 1043–4) how he obtained loudness as well as pitch, and on p. 1044, he says: "Hitherto it has not been possible to reproduce human speech *with a distinctness sufficient for every one. The consonants are for the most part reproduced pretty distinctly*, but the vowels as yet *not in an equal degree*." On the 7th of March, 1876, Bell had only gotten "a sort of muttering effect when a person talked very loudly at the other end;" Reis had long before gotten distinct consonted sounds and indistinct vowels sounds. Bell had gotten "varying pitch," but "not quality;" Reis had gotten varying pitch and some degree of quality. And yet, knowing all about the Reis Telephone, Bell is ready to swear (Ans. 437, C. Vol. 2, p. 1642) that Reis' telephone is *not* capable of transmitting speech, while he, Bell, had, in July, 1875, and *by means of an instrument doing far less than Reis'*, produced results "such as to lead me to the firm conviction that the speaking telephone was a *fait accompli*." (C. Vol. 2, p. 1575. Ans. 282.)

It is sufficient to say that he had done nothing of the kind and believed nothing of the kind—his experiments had been a total failure, so far as concerned the transmission of articulate speech, or the element of "quality" which distinguishes articulate speech. Fourteen days after he ceased his experiments, he wrote to Mr. Hubbard that it remained for "the future" to "discover;" nearly five months afterwards he wrote, for Mr. George Brown's information, that he had not reproduced quality nor anything else but "a sort of muttering effect."

On October 31, 1877, Mr. Bell read to the Society of Telegraph Engineers at London, England, a lecture giving the history of his invention, which is printed in full in C. Exhibits, pp. 879–910. In this lecture (pp. 899, 900) Mr. Bell described his 1875 experiments and their results and said:—

> "The results, however, were *unsatisfactory and discouraging*. My friend, Mr. Thomas A. Watson, who assisted me in this first experiment, declared that he heard *a faint sound* proceed from the telephone at his end of the circuit but *I was unable to verify his assertion*. After many experiments, attended by *the same* only partially successful results, I determined to reduce the size and weight of the spring as much as possible. For this purpose I glued a piece of clock-spring, about the size and shape of my thumb nail, firmly to the centre of the diaphragm, and had a similar instrument at the other end; we were *then* enabled *to obtain distinctly audible effects*." (C. Exhibits, p. 900.)

Now that reconstruction and reorganization of the two instruments of July, 1875, by removing the essential operative parts and substituting a piece of clock-spring glued to the centre of the diaphragm, was not done till the latter part of March, or in April, 1876, a month after his patent issued!

Watson testifies to this fact in his answers 226 to 233, inclusive, C. Vol. 1, pp. 324, 325; and Bell in his answer to cross-question 472, p. 1653, C. Vol. 2, admits the fact, saying; "My recollection agrees with his" (Watson's), and also admits the fact in his answer 180, C. Vol. 1, p. 173.

It thus appears from Bell's London lecture, coupled with the testimony of Watson and himself:

1. That they did not "obtain distinctly audible effects" with the instruments in the form in which they were tested in 1875, nor until after they had been reorganized and changed about the first of April, 1876.

2. That the results of the first tests in July, 1875, were "unsatisfactory and discouraging."

3. That all subsequent tests with these instruments, up to their reorganization in April, 1876, were "attended by *the same* only partially successful results."

4. That in all these tests, before the instruments were reorganized, Watson could hear only "*a faint sound.*"

5. *That Bell could hear not even a faint sound—in fact nothing at all.*

6. That when, on December, 28, 1875, Bell wrote, in presence of Mr. George Brown, that "a sort of muttering effect was perceived," *he wrote what he had learned from Watson, but had not been able himself to verify.*

This statement of his London Lecture, that Watson heard only a sound and he, Bell, could hear absolutely nothing, is corroborated by his sworn preliminary statement of November 20, 1878, wherein (C. Exhibits, p. 1009) he states as follows:—

"I heard nothing, but Mr. Watson soon rushed up stairs and said he could hear my voice, *but could not make out what I said.* We then changed places, but *with the same result;* he heard my *voice, but I could not hear his.*"

Even in his answer 282, C. Vol. 2, p. 1575, Mr. Bell admits that he "was unable to hear anything on that occasion."

Remembering, always, his admission in cross-answer 283 (C. Vol. 2., p. 1575) *that, until the issue of his patent, March 7, 1876, he had never attained any better results than the results obtained in July, 1875,* we see that evidence could hardly be presented more conclusive of the fact that, at least up to March 7, 1876, Mr. Bell had not attained *a speaking telephone.*

But the evidence on this point has not yet been exhausted.

Gardiner G. Hubbard, Mr. Bell's financial backer and now his father-in-law, was examined as a witness for the Bell Telephone Co. in the Dowd suit, and his deposition in that suit was introduced by the complainants in this suit and is printed with their exhibits (C. Exhibits, pp. 955 to 966). He was questioned (p 957) about Bell's letters from May 4, 1875, to September 28, 1875, and then (p. 958) the following question and answer appear :—

"*Int. 12.* State whether or not you remember, *during the period of these letters,* seeing Mr. Bell have an apparatus in which the reed was attached to a membrane, and, if so, how was the membrane to be moved or vibrated?

"*Ans.* I remember distinctly two instruments to each of which a membrane was attached, and think a reed was fastened to the membranes, but I am not certain, and that he undertook to speak to one membrane while Mr. Watson and myself was to hear at the other instrument. The instruments were so arranged that the membranes could be stretched till they were quite tight, like a small drum head. I could hear a sound *but could never distinguish any spoken words.*"

It will be remembered that Watson assisted him in *all* his alleged telephone experiments in 1875.

"*Cross Q. 284.* Did Mr. Watson assist you in all your telephone experiments in June and July, 1875?

"*Ans.* He did."

(Bell, C. Vol. 2, p. 1575):—

That Watson ceased work for him at the end of July, 1875, and Bell ceased work at the same time:

(Bell, Ans. 560, C. Vol. 2, p. 1674; Ans. 521, Id. pp. 1663-4; Ans. 563, Id. p. 1676 *et seq;* Watson C. Vol. 1, p. 316, Ans. 179):—

And that Bell made no further electric experiment till after the date of his patent:

(Bell, Ans. 297, C. Vol. 2, p. 1581).

It will therefore be seen that Watson's testimony as to when *he* first heard articulate speech through a telephone is as material and important as that of Bell himself. Watson testifies as follows:

"*I have no recollection of having understood anything that was said through the telephone prior to March 10, 1876.*"

(Ans. 146, C. Vol. 1, p. 312).

In C. Vol. 1, pp. 203, 204, Ans. 13 to 15, Watson describes the experiments of June and July, 1875, and their results, to the same effect as Bell described them in his London lecture. He says he "could hear a faint sound" and Bell could hear "nothing." In his Ans. 16, p. 204, he tells us what Bell "*expected*" to do with the discovery of June 2; and in his Ans. 17, same page, he tells us what Bell was "confident" he could do if he could only "ultilize" that discovery.

This last Ans. should be read in connection with Bell's letter to Hubbard of August 14, 1875, C. Vol. 2 p. 1675.

Bell, Hubbard and Watson are the three men, of all living, who were in a position to know what results were or were not obtained through those instruments of 1875. Bell admits, in his letter of August 14, 1875, that the speaking telephone was yet a thing for "the future" to "discover;" in his paper of December 28, 1875, that the instruments had not reproduced "quality" and that he, himself, had never heard even a faint sound through them; in his London lecture, that "the results were unsatisfactory and discouraging," and only "the same" results were obtained up to the time when he applied the clock spring about the first of April, 1875; in his preliminary statement of November 20, 1878, that he had not heard a sound through these instruments in 1875, nor any "intelligible articulation" through *any* instruments until March 10, 1876; and, in his testimony to the same effect Watson swears positively that he never understood a word through any telephone apparatus till March 10, 1876: and Hubbard corroborates them both.* That would seem to dispose of the question. The instruments were not preserved and are not in evidence. Some parts of them are, and an alleged copy made from memory is, but not the originals in their entirety. Mr. Bell describes the construction of these instruments (C. Vol. 2, pp. 1582 to 1587) and it appears, (p. 1583) that the armature of the one was made at first with a pivot hinge but it was subsequently removed and another and different armature, with a leather hinge, applied in its place; also (p. 1584) that the second one was made with an armature attached by a leather hinge; and (p. 1585, Ans. 302) that he is unable to produce any of the armatures that were used with either of those instruments in July, 1875, with a leather hinge, and (Id. Ans. 303) is unable to give accurately the details of the two leather-hinge armatures as to size, dimensions, weight, &c., except by mere guess-work. It also appears from his testimony, C. Vol. 2, p. 1583, that various changes were made in the mode of attaching the armatures to the centre of the diaphragm, one method being to use a cork with a metal washer, another being to use a little metal pillar in place of the cork, and that "*these improvements, however, did not meet the difficulties of the case,*" and that membranes of different thickness, and armatures of different thickness, were tried.

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* In fact, the experiments of July, 1875, were so unsatisfactory and discouraging that they seem to have made both Mr. Bell and Mr. Watson ill. "Then came the experiments of June 2d, 1875. This was followed by *a period of great excitement* over the speaking telephone, a period of constant experiment and *sleepless nights*. During this period my mind was *also* much *worried* by domestic matters, and by pecuniary distress; and *all these things* led to a complete breakdown of my health about the end of July or the commencement of August." (Bell, C. Vol. 2. pp. 1663, 1664, Ans. 521) "About the end of July the experiments were suspended on account of the illness of Mr. Watson, and when he had recovered I was in no condition to resume work. By about the commencement of August my health had completely broken down." (Id. p. 1674, Ans. 560.)

It further appears from his answer 177, C. Vol. 1, p. 173, that prior to the issue of his patent of March 7, 1876, he never constructed or used any membrane "telephones" except the two instruments of June and July 1875; and from his answer 300, (C. Vol. 2, p. 1584) that *no other instruments like these two of July, 1875, were ever afterward constructed until the evidence in the Dowd case was taken, which was in 1879.* Any attempted reconstruction of these instruments in 1879, or since, would, of course, be mere guess-work, and would be essentially affected by the new knowledge of the requirements needed for successfully transmitting speech.

Watson testifies (C. Vol. 1, p. 328, Ans. 259) that, in reconstructing these instruments for exhibits in the suit, *he had to supply the missing parts simply from memory* and *judgment;* and (Id., Ans. 260), that *he can not swear that the reproduced instruments are exact copies of the originals* in all respects, but only the best he could do from memory, aided by the presence of the few parts which remained extant.

All such alleged reproductions, and all alleged tests made with them are, therefore, inconclusive and incompetent. It is absolutely certain that the instruments made in 1875

never transmitted and reproduced audibly a single word of articulate speech.

Bell's First Reproduction of Speech was with Gray's Transmitter.

We have observed, both from Watson's testimony (C. Vol. 1, p. 312, Ans. 146) and from Bell's preliminary statement (C. Exhibits, p. 1011), that intelligible articulation was obtained through *something*, on March 10, 1876, although not through the instruments of July, 1875, either in their original or modified form.

This part of the history is instructive and interesting, and deserves special mention.

In his preliminary statement (p. 1011) Mr. Bell says:—

"I ought to state that *I did not, before the filing of my application,"* (February 14, 1876) *"construct the devices described in my specification for varying the resistance* of a voltaic circuit as means for producing an undulatory current. *I was in Washington the first few days in March*, and *immediately on my return* I constructed an apparatus having a wire attached to a stretched membrane, dipping into a vessel containing water, forming part of a circuit, the resistance of the circuit being varied by the vibration of the membrane, which caused the wire to dip more or less deeply into the liquid."

(This was a liquid transmitter.)

"On the 10th day of March, Mr. Watson and myself tried *this apparatus as a transmitter*, using *the steel spring armature depicted in my patent as a receiver*, and obtained intelligible articulation."

Watson (C. Vol. 1, pp. 309 to 316) describes this liquid transmitter and this receiver. *The receiver*, he says, (Ans. 125) was *"a harmonic receiver,"* and, (Ans. 127) *it was precisely similar to the instrument shown at the ends of the circuit in* ***Fig.*** *5, of Bell's patent of March 7, 1876*—that is to say, *it was not one of the alleged telephone instruments of July, 1875*, but was a multiple telegraph instrument. *The transmitter* he describes in answers 125, 147, 148, 149, 150, 164, and illustrates it in answer 149 by a sketch printed on page 313, C. Vol. 1.

It thus appears that neither of the instruments tried in

March, 1876, was like the alleged membrane telephone instruments of July, 1875.

Now by reference to C. Exhibits, pp. 14 to 16 it will be seen that Bell's application for the patent of March 7, 1876, was filed on Feb. 14, 1876, and was soon afterward suspended by the examiner by reason of a *caveat* filed by another person on the same day, but two hours later. Who this caveator was, and what his caveat was for, appears in the letter of Elisha Gray to Mr. Bell, printed in C. Vol. 2, p. 1625, and in Bell's answer 491, C. Vol. 2, p. 1657; and the entire caveat (Elisha Gray's) is printed in C. Exhibits, pp. 869 to 878, with copies of the caveat drawings attached. By comparing Watson's sketch (Exhibit Watson Sketch No. 1), C. Vol. 1, p. 313, with the drawings of Gray's caveat of Feb. 14, 1876, it will be seen that *the transmitters are substantially identical!* It was Gray's liquid transmitter, then, that Mr. Bell caused to be constructed "immediately on" his "return" from Washington, in "the first few days in March," 1876, and with which he, *for the first time in his life*, "obtained intelligible articulation."

Now by reference to Bell's letter to Gray, C. Vol. 2, p. 1627, it further appears that Mr. Bell knew that this caveat *"had something to do with the vibration of a wire in water, and therefore conflicted with my* (Bell's) *patent*," and by reference to C. Vol. 1, pp. 195 to 197, it appears that Mr. Bell had been to Washington and had an interview with the Patent Office examiner, Wilber, who ordered the interference, and had carried away from that interview the impression that the conflicting point was with reference to the "vibration of the conducting wire in mercury or other liquid." (Ans. 255, C. Vol. 1, p. 197.)

The interference was dissolved on the 25th of February, 1876. (See examiner's official letter of that date, C. Exhibits, p. 16.) When Bell had the interview with the examiner, the interference "had already been dissolved." (Bell, C. Vol. 1, top of p. 196.) Bell's visit to Washington therefore was between February 25, 1876 and March 7, 1876, or, as he says, in his preliminary statement, "in the first few days in March."

It was during that short period that he learned of what Gray had been doing, and *it was in consequence of that information that he hurried back to Boston, called Watson again into his employ, and set him at work to make a liquid transmitter*—an instrument which he had never before made (See the preliminary statement C. Exhibits, p. 1011, and see, also, Watson's Ans. 152, 153, C. Vol. 1, p. 313). Watson testifies that it was with *this* transmitter that they first got speech. Bell says, in substance, in his preliminary statement, C. Exhibits, p. 1011, that it was with *this* transmitter that they first "obtained intelligible articulation;" and Watson's enthusiasm, mentioned in his 136th Ans., C. Vol. 1, p. 311, shows that the result was unprecedented and exciting.

Now, as soon as they got speech, did they leave the date simply to the uncertainties of memory? Not at all—Watson wrote down and preserved, in a memorandum book, the very words which were heard through the instrument. (See Ans. 120, C. Vol. 1, p. 309). Here is the memorandum—"March 10, 1876. *Mr. Watson, come here; I want you. How do you do? God save the Queen,* and *several other articulate sounds." They never recorded any articulate sound before that day.* (Watson, Ans. 167, C. Vol. 1, p. 314). The result produced great enthusiasm.

Yet it took "an hour or two" (Watson, Ans. 137, C. Vol. 1, p. 311) to get these fifteen words and several other articulate sounds! Watson says he can not say how much was attempted to be transmitted that was not heard, but he considers it "highly probable that many words were spoken at the transmitter that were not understood at the receiver during that experiment" of March 10, 1876. (Ans. 141, p. 311. Id.)

Again: Even this liquid transmitter required experiment and change, *after the date of Mr. Bell's patent*, in order to make it operate. It was first tried about the date of his patent, or a day or two after, and would not operate successfully. (Watson, Ans. 156, p. 314, to Ans. 175, p. 316.) Those changes were afterwards made and then it worked.

Watson does not remember what all the charges were. (Ans. 160.)

"*Cross-Int. 174.* Before these changes were tested on March 10, 1876, had you or Mr. Bell any knowledge of the striking results which they would produce, or was your knowledge of their effect gained only from the test of March 10?

"*Ans.* I hadn't the slightest knowledge myself what the effect would be of the changes, and I don't think Mr. Bell had."

"*Cross-Int. 175.* In the state of the art at that time I suppose the effect of those changes could not have been known except by actual experiment and test, could it?

"*Ans.* That is my opinion." (pp. 315, 316).

In other words, Mr. Bell, on March 7, 1876, had not the knowledge requisite to construct an operative liquid transmitter, or direct Watson how to make one, but it required further experiment, *after that time*, to enable him to acquire that knowledge; and when the changes were about to be made and tested, neither he nor Watson could predict what their result was going to be! The work which they were then doing, was manifestly the proper and ordinary work of *invention*—the invention had not, up to that time, been completed. When the complainants argue that Mr. Bell described a liquid transmitter in his patent, we answer that it is difficult to understand how Mr. Bell could have described in such "clear, full and exact terms" that a skilled mechanic could make and operate it, that which he himself did not at that time know how to make and operate.

And further: The complainant's own expert, Mr. Pope, testifies (C. Vol. 2, pp. 1424 1425, Ans. 300, 301) that when he made his report to Mr. Orton in 1877, a liquid transmitter was a thing unknown to him, although he was then familiar with Bell's patents, (Ans. 300); and that the description in Bell's patent of March 7, 1876, is not sufficient to enable a person skilled in the art to make, without further experiment, a practically operative speaking telephone transmitter on that principle. (Ans. 301.)

Let it be noted that this was a resistance telephone—*the* *magneto apparatus of July, 1875, had up to that date never operated.* A month afterward, about April 1876, they reorganized it experimentally, with the small piece of clock spring, about the size of a thumb nail, glued to the centre of the diaphragm, and then, for the first time, that too operated; and the instruments thus operated, were almost exact duplicates of Gray's caveat *receivers!*

At this test of March 10, 1876, where were the instruments of 1875? Had their results been so "unsatisfactory and discouraging" to Mr. Bell, that they were already dismantled or destroyed? If they were in existence, and Mr. Bell or Mr. Watson had the slightest confidence in their working, *why didn't they use one of them as a receiver, with the liquid transmitter?* Why take the imperfect multiple telegraph instrument as a receiver, with a membrane telephone receiver right at hand ready for use? Even after making a successful test with the harmonic receiver, why didn't they try the alleged "telephone receivers?" *They seem to have substantially abandoned the instruments of July, 1875.* Even after getting speech through other and different instruments, on March 10, 1876, they do not recur to them nor attempt to test them, nor do they ever afterwards appear. A month afterwards, they make the magneto "thumb nail" instruments, which Watson says (Ans. 230, 231, p. 325) were new instruments—not the old ones of July, 1875.

"*Cross Int. 230.* Who made that instrument and when?

"*Ans.* I think I did, just before it was tested.

"*Cross Int. 231.* It was made after March 10, 1876, was it not?

"*Ans. According to my recollection.*"

Again—

"*Cross-Int. 226.* To the best of your recollection, how long after March 10, 1876, was it that you first heard spoken words successfully transmitted over that magneto-instrument?

"*Ans.* To the best of my recollection during March or *April*, 1876."

Bell himself testifies:

"*Int. 180.* When did you first construct a membrane telephone with a piece of clockspring about the size and shape of your thumbnail, glued to the centre of the diaphragm?

"*Ans.* Shortly *after* the granting of my patent of March 7, 1876; I *think* within the month of March."

Even of these "thumb-nail" magnetos of April, 1876, Mr. Bell, in his London lecture of Oct. 31, 1877, after stating *one question and answer successfully heard through them*, to his great satisfaction and delight, said:

"*It is a mistake, however, to suppose that the articulation was by any means perfect*, and expectancy, no doubt, had a great deal to do with my recognition of the sentence; still the articulation was there, and I recognized the fact that the indistinctness was entirely due to the imperfection of the instrument." (C. Exhibit p. 901). *

It is clear, therefore, that Mr. Bell never succeeded in reproducing speech with *any* apparatus until March 10, 1876, *nor with any magneto instruments until April, 1876, and then only imperfectly*. This fact was admitted by Mr. Storrow, in his argument of the New Orleans cases in 1886, where, referring to the test of July, 1875, he said: "Which, it is claimed, *and probably truthfully*, did not amount to the intelligible transmission of articulate words." (See his printed New Orleans argument, p. 36.)

True, Mr. Bell endeavors to furnish a plausible explanation why he never heard any speech before, evidently taking his cue from his counsel in a leading question, 91, C. Vol. 1, p. 445.

"Int. 91. Was Mr. Williams' workshop a quiet place or a noisy place at the time that you tried those experiments?

"Ans. A very noisy place."

Following this manifest hint, he swears (C. Vol. 2, p. 1575) as follows:—

"We then changed places, but I was unable to hear anything on that occasion, This inability *I attributed at the*

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* These instruments were perfected in the *fall of* 1876, up to which time their results were very poor. See memoranda of Bell's experiments printed in C. Exhibits, pp. 35 to 45; and Gray's description of Bell's Centennial Exhibition, quoted in Pope's deposition, C Vol. 2, p. 1452; and the Centennial Reports, C. Vol. 1, pp. 236, 238.

time to the noise of the machinery in the workshop, and to the fact that Mr. Watson *was unable to throw out his voice with sufficient force* to set the membrane of his telephone in good vibration."

Neither of these last statements can be credited. One of them he has, himself, flatly contradicted in his preliminary statement, (C. Exhibits, p. 1009), where he says:—

"We then changed places, but with the same result; he heard my voice, but I could not hear his. * * * I am free to say that the results were not as good as I had expected, but *I believed that the failure to obtain better results was due to the imperfect construction of the instruments, or to their parts not being properly proportioned.*"

The other of these two statements is substantially contradicted by Mr. Bell's memorandum on the sketch shown to Mr. George Brown on December 28, 1875, which states that "A sort of muttering effect was perceived at the receiving end when a person talked *very loudly* at the other end;" and also by Watson (C. Vol. 1, p. 203) who says: "*I shouted* into the membrane telephone. Mr. Bell listened at the receiver. I think he heard nothing. We changed places. *He shouted* at the telephone and I listened at the receiver. I could hear a faint sound." Bell says, in his London lecture (C. Exhibits, p. 900) "after *many* experiments attended by *the same* only partially successful results," &c. &c.

The excuse attempted in his 282d answer is, therefore, not the true explanation. It only shows how careful we must be not to accept the uncorroborated statements of Mr. Bell. In fact, it is absurd on its face. Does anybody of common sense believe that if Mr. Bell was anxiously experimenting to get articulate speech, and thought that the noise of Williams' workshop prevented him from hearing it, he would not have tried the experiment somewhere else, or in the evening when the machinery was not running? And that if he deemed Watson's voice defective, he would not have tried that of some other person? There is no pretense that his own voice was defective, but, although, he too, shouted, Watson could hear no words from him—nothing but a faint muttering effect.

PART II

We have called attention to the proved fact that Mr. Bell obtained his first reproduction of speech electrically through Gray's liquid transmitter, on March 10, 1876, a few days after he had acquired knowledge of Gray's caveat at Washington. We desire the court, in this connection, to note the following facts, viz.:

1. That Bell had never made, nor attempted to make, such a transmitter, nor any experiment in that direction, *until after he had knowledge of Gray's caveat.* (C. Vol. 1, p. 173, Ans. 177.)

2. That all of Bell's telephonic apparatus and experiments, prior to his knowledge of Gray's caveat, *were magneto-electric apparatus and experiments.*

3. That Bell's letter of August 14, 1875, shows that he had, after reviewing all his theories and experiments, settled down upon the conviction that *the magneto-electric* current was the current for *speech-transmission,* and the "current" or "principle" to be patented, and was perfectly well aware that he had not invented an *apparatus* adapted to the successful use of such current for such purpose, but believed that "the future" would "discover means of utilizing" his theoretically correct *current.*

4. That, just prior to going to Washington, about the first of March, 1876, he was again commencing to devote his energies to his *autograph telegraph.* "Few, if any, experiments relating to the autograph telegraph, or indeed to any electrical subject, were made between the end of July, 1875, and March, 1876. *At that time I was again working* at the combination of instruments necessary to put my autograph telegraph into practical operation, as Mr. Hubbard and Mr. Sanders thought that it would prove the most immediately valuable of all my inventions." (A. G. Bell, Ans. to X. Q. 534, p. 1666, C. Vol. 2).

5. That his trip to Washington *suddenly caused him to cease*

his autograph telegraph experiments, and to re-enter upon the work of telephone experiments. It also caused him, for the time being, to neglect the magno-electric current, which he had before believed to be the only current adapted to sound-copying, and to go to work experimenting with Gray's *variable-resistance current*—a different current altogether.

6. That, after getting speech through Gray's liquid transmitter, on March 10, 1876, he immediately resumed experiments with his *magneto-electric* current and apparatus for speech transmission, but reconstructed the *apparatus*, and in April, got speech through it.

7. That this reconstructed apparatus of April, 1876, was so reconstructed that it was not like his apparatus of July, 1875, *but was exactly like the receivers shown in Gray's caveat!*

The 1875 instruments of Bell are illustrated by the cut shown on p. 1012, C. Exhibits. They had a stout bar-armature extending in an inclined direction from the edge of the case or box to the center of the diaphragm, being hinged at one end to the case and attached at the other end rigidly to the centre of the diaphragm—obviously a mode of construction borrowed from the prior Scott *phonautograph*, from which it differed only in substituting an armature for the stylus of the phonautograph, and making this armature-stylus terminate at the centre of the diaphragm instead of prolonging it beyond the opposite edge of the case as in the phonautograph.

The April, 1876, *receiver suppressed this hinged armature, and substituted for it a small, round, thin plate of inductive metal shellaced to the centre of the diaphragm*—a construction exactly like that shown in the receiver of Gray's caveat. As this receiver was to be used with a magneto-electric current, the transmitter would simply be a copy of the receiver, and hence, it was duplicated for a transmitter.

Thus, immediately after knowledge of Gray's caveat, Bell went to work and made Gray's liquid *caveat-transmitter*, and then went to work and made Gray's *caveat-receiver*, and he got his *first* speech on March 10, through Gray's *transmitter* and his *second* speech in April, through a pair of Gray's *receivers*. Comment is unnecessary.

8. In May, 1876, he delivered a lecture on the telephone to the American Academy of Arts and Sciences, in which he described and exhibited his magneto-electric telephone, and also the liquid transmitter, but did not give Gray the credit due for the latter invention and its associated variable-resistance current. (See C. Exhibits, pp. 67 to 77.)

9. In June, 1876, Bell exhibited his magneto-electric telephone at a meeting of a number of eminent persons at the Centennial, where it made a great sensation. He alleges that he had a liquid transmitter present among the instruments exhibited; *but Elisha Gray, who was present, and Prof. Barker, who virtually conducted the exhibition, both deny that any such instrument was present.* (Gray, *Overland Record*, Vol. IV., p. 2911; Barker, *Additional Proofs* p. 6–35.)

10. In the meanwhile Bell was studying and experimenting to perfect the magneto-telephone, and, in the fall of 1876, about November 12 (see C. Exhibit, p. 44), it was perfected by the substitution of a *metal-plate diaphragm*, and a *permanent magnet*, instead of a battery, to polarize the electro-magnet.

11. Bell applied for a patent on this perfected invention in January, 1877, and obtained it January 30, 1877. *This is a patent for a magneto-telephone* — for a *combination of mechanical instrumentalities*, and not for a mere current-theory.

12. In this patent Bell refers to the variable-resistance transmitting *in the most careful and guarded manner*, as a transmitter which he had *described and exhibited* at the meeting of the American Academy of Sciences in May, 1876, which was true; but *not* as a transmitter which he had *invented*, which would not have been true. The apparent intention was to make the reference a means of afterward expanding his claim by construction, but to avoid swearing that he had himself invented the variable-resistance current and transmitter.

With a thorough knowledge of the above facts, the court will now be prepared to enter upon the discussion of Mr. Bell's two patents, and of the further matters affecting their scope and validity. Part II

WHAT BELL PATENTED ON MARCH 7, 1876.

His Theory of Copying Sound Electrically.

We have now seen that, on March 7, 1876, Mr. Bell had never made an operative telephone, nor obtained through his instruments an audible word, nor been able even to hear the faintest sound through them himself; but, without waiting to invent means for utilizing the electric current for speech-transmission, had determined to patent what he felt sure would prove to be the "current," theory or "principle" of the future telephone, if it ever should be discovered.

Let us now consider what this theory was.

Mr. Bell had long been familiar with the laws of sound, as explained by modern science. He knew that any sound consists of a succession of aerial waves, each of which waves is made up of one air-condensation and one air-rarefaction. He knew that the air-particles in a sound-wave move, at each condensation, *forward* from, and, at each rarefaction, *backward* towards, the exciting cause of the sound. He also knew that the amplitude of vibration of this movement determined the loudness, and the rate or number of the vibrations per second determined the pitch of the sound.

He thus saw that every sound-wave exhibits *three* essential characteristics—the air-particles must move alternately *forward and backward*, or reverse their direction of movement, or else there could be *no vibration*, and consequently, *no sound*. They must also exhibit a certain amplitude of vibration, corresponding to the loudness of the given sound, and varying if the loudness varied; and they must vibrate at a certain rate per second, corresponding to the pitch of the given sound, and varying if the pitch varied.

Of these three characteristics, *the to-and-fro movement was the most conspicuous and fundamental, because without it there could* *be no sound wave at all;* while the varying amplitude and rate were *secondary characteristics*, serving merely to determine the *nature or character* of any particular sound caused by the to-and-fro movements of the air-particles.

With this knowledge of sound, he engaged as early as 1872 in the work of trying to invent a multiple-telegraph, by which a number of telegraphic signals could be transmitted over one wire simultaneously without interfering with each other. To accomplish this it was only necessary to utilize differences of *pitch;* for, if two telegraph transmitters, A and B, were arranged to vibrate by mechanical motive-power at different but definite rates per second, and each to throw an electrical impulse upon the line at every vibration, then two telegraph receivers, A¹ and B¹, adapted to be moved by such electrical impulses and tuned to vibrate at the same rates per second as the respective transmitters would, by what musicians call "sympathetic vibration," pick out and respond to the signals of their respective transmitters: that is to say, receiver A¹ being tuned to the same pitch as transmitter A, and receiver B¹ to the same pitch as transmitter B, then receiver A¹ would respond only to the signals of transmitter A, and receiver B¹ only to the signals of transmitter B; and thus each message would be received only by the instrument intended to work with the particular transmitter employed in sending that message

While engaged upon this multiple-telegraph invention in 1872 or 1873, he read Baille's article on speech transmission by electricity, published in this country in 1872, in the work entitled "The Wonders of Electricity;" and this article both directed his attention to the possibility of electrical speech-transmission and informed him of the main scientific laws involved in such possible transmission. We get the facts from Mr. Bell's Harmonic Interference Statement, (C. Exhibits, pp. 980–981), where he says:—

"Somewhere about November, 1873, an article entitled 'The Acoustic Telegraph,' published in 'The Wonders of Electricity,' led me to substitute steel plates for tuning-forks in my telegraphic experiments. Two transmitting instruments and two receiving instruments (specimens of which are still in my possession in their original form), were made like those shown in Fig. 5. These were arranged on circuit, as shown in Fig. 6."

Baille's article, (printed in D. Add. Proofs, pp. 429–431) refers first to Helmholtz' method of reproducing articulate sounds by synthesis, and then describes what was already known to the world as Charles Bourseul's proposed method of, and apparatus for, transmitting and reproducing speech electrically, in the following language, the italics being our own:—

"This is not the place to discuss such theories, *but if we grant that there is any truth in them, we can understand that the acoustic telegraph can be invented and can transmit the living voice.* Already experiments have been made in this direction. A vibrating plate produces a sound, and according to the rapidity of the vibrations, these sounds are sharp or flat. At each of the vibrations the plate touches a small point placed in front of it, and this contact suffices to throw the current into line; when the plate ceases to vibrate and returns to its position of equilibrium, it no longer touches the metal point and the current is consequently interrupted. By this means is obtained a series of interruptions, more or less rapid, according to the sound, the current being thrown into line and interrupted once for each of the vibrations. *At the extremity of the line the current enters an electro magnet which attracts another vibrating plate of size and quality identical with the former.* Attracted and repelled very rapidly, *exactly and as rapidly in fact as the plate mentioned above,* this second plate gives forth a sound which will have the same musical value as that of the other, as the number of vibrations per second is the same in both cases," etc., etc.

In the original Bourseul article, published at Paris, August, 1854, and printed, for this court, in the pamphlet entitled "Reis pamphlet—Reis and Bourseul publications—pages 1848–1970, Overland Record," the philosophy of Bourseul is stated still more clearly, as follows:

"Suppose that a man speaks near *a movable disk, sufficiently flexible to lose none of the vibrations of the voice;* that this disk alternately makes and breaks the connection with a battery; *you may have at a distance another disk which will simultaneously execute the same vibrations.* * * * * *

However this may be, observe that sylables can only reproduce upon the sense of hearing *the vibrations of the intervening medium.* Reproduce precisely *these vibrations,* and you will reproduce precisely these syllables."

It is important to observe that Mr. Bell not only had his attention directed by the Baille article to electric speech transmission, as he admits but also that the article directed his attention specifically to the leading fact that *the voice was to act against a vibrating plate or disk at the transmitting station; that a similar plate was to be set into vibration at the receiving station by means of current-impulses traversing an electro-magnet arranged to attract and repel the plate;* and that the problem was *to reproduce in the receiving plate the same vibrations that the voice imparted to the transmitting plate.*

This information simplified Mr. Bell's work materially. But he obtained other and still more important information from Philip Reis' Lecture on the Reis Telephone, published in Germany in December, 1860, and a translation of which is printed in the pamphlet last above referred to, pp. 11–18. In Bell's preliminary statement (C. Exhibits, p. 1004) referring to an interview which he had with Prof. Henry, at the Smithsonian Institute, on March 18, 1875, Mr. Bell says:—

"I had previously seen in the Institute of Technology, in Boston, the receiving instrument of Reis' telephone; *and was acquainted with the construction of the whole apparatus by diagrams and printed descriptions,*" and in his testimony (C. Vol. 1, p. 176, Ans. 191), he describes the *Reis receiver* as known to him and *even included among the receiving instruments referred to in his telegraph application of Feb. 25, 1875.*

Referring now to Reis' lecture, we find therein described the whole scientific theory of sound-copying, and a description of a wonderfully ingenious and theoretically perfect device for transmitting and reproducing speech. The lecture shows that Reis was a profound thinker, who had reasoned out a logical theory of electrical sound transmission, and devised therefor an apparatus which is a marvel of inventive ingenuity and scientific thought.

He describes the laws and the *composite character* of sound; *the fact that sounds can be graphically represented by curves;* exhibits and explains *the curves, and the law of their formation;* declares that "As soon, then, as it is possible to produce, *anywhere and in any manner* vibrations *whose curves shall be the same as those of any given tone or combination of tones, we shall receive the same impression as that tone or combination of tones would have produced on us;*" states that his apparatus is *constructed on that principle;* and describes his apparatus and its mode of operation.

This apparatus should be understood *precisely as Reis himself described it,* and not as Legat and others, since his day, have erroneously described it. *The only correct statement of its theory and mode of operation is to be found in the original source of evidence, Reis' own lecture of December, 1861.* As there described the voice was to ~~infringe~~ impinge upon a flexible diaphragm and set the latter into vibrations corresponding *both in rate and amplitude* to the vibrations of the air constituting the sound. By an electrical connection, the receiver was also to execute an exact copy of the transmitting vibrations, in every respect, *including both rate and amplitude.* The vibrations of the receiver, being exact copies of those of the transmitter, should reproduce the exact sounds transmitted, whether such sounds were those of articulate speech or any other sounds.

This exact correspondence of the receiving and transmitting vibrations ~~has~~ was to be obtained in the following manner, viz.:—

The transmitting diaphragm was provided with a sort of hammer-and-anvil apparatus. The anvil consisted of a thin conducting strip of platinum cemented to the diaphragm and connected to one of the binding posts in the circuit. The hammer consisted also of a thin strip of metal, connected to the other binding post and extending over the middle of the diaphragm where it terminated in a platinum pin which rested normally upon the anvil above described. When the hammer and anvil were in contact the circuit was closed; when they were not in contact the circuit was open and the current broken. The vibrations of the diaphragm under the influence of spoken or other sounds, would throw the hammer up or away from the anvil and break the circuit, and when the hammer dropped back and resumed contact, the circuit would be re-established. The louder the sound, the more violent would be the vibration of the membrane; hence, the farther would the hammer be forced away from the contact point and the longer would it take to get back again and re-establish the circuit. *Hence, each sound-wave would make one break of the line current, and the time during which this break would last would be determined by the loudness of the transmitting sound.*

Thus the current itself would possess characteristics determined by the pitch and loudness of the sound to be transmitted, to wit: the rate of its interruptions per second would be determined by the pitch of the sound and the length of each interruption would be determined by the loudness of the sound.

Let us now turn to his receiving instrument at the other end of the line. This was a coil of wire, about six inches long, through which the broken current passed on its way around the circuit. Extending through the center of this coil was a wire like a knitting needle. Each time a current-impulse traversed the coil, it would, by induction, magnetize the wire or needle at the center of the coil; and when the current was broken the needle would demagnetize. It was well known that magnetizing a wire elongates it slightly, and that when demagnetized the elasticity of the wire causes it to contract again to its normal length. Reis, therefore, saw that each current impulse that passed through the coil would elongate the needle, and each break in the current would allow the needle to contract to its normal length—hence, that the needle would be set into longitudinal vibrations, corresponding in rate per second exactly to the rate per second of the current-impulses, and therefore to the rate of the vibrations of the transmitting diaphragm and of the air which set it in motion.

But when a needle, magnetized by the induction of a passing current, is demagnetized by breaking the current the demagnetization is not instantaneous, but is completed in an appreciable time. If, therefore, the break in the current is long enough, the needle will have time to complete its demagnetization and contract back to its normal length. On the contrary, if the break is shorter than the time required to fully demagnetize the needle, the latter will not be able to contract clear back to its normal length, but, while on its way back, will be met by the next succeeding current impulse and thrown forward again by its magnetization. In other words, the length of the breaks of current will control the amplitude of vibration of the needle, such amplitude being the greater as the breaks are the longer. But the breaks are the longer just in proportion as the transmitting sound is the louder; hence, it follows that the amplitude of vibration of the receiving needle will vary as the amplitude of vibration of the transmitting diaphragm varies, or, in other words, as the loudness of the sounds to be transmitted vary; and, as we have seen, the rate of vibration of the needle, will vary as the pitch of the sound to be transmitted varies.

It follows, at least theoretically, that Reis' receiving needle will execute vibrations which are exact copies of the vibrations of the transmitting diaphragm, both in pitch and in loudness, and, therefore, that it ought to give off an exact copy of the sound spoken into the transmitter. These spoken and reproduced sounds, whether simple tones or combinations of tones, Reis declares to be *graphically representable by the same curves.* And he closes by stating that he has succeeded in transmitting and reproducing consonant sounds with this apparatus, but vowel sounds not so perfectly, and the tones of human speech not with a distinctness sufficient for every one.

All this was very important information to Mr. Bell. It not only directed his attention to the possibility of electrically copying sounds of all kinds, but it explained to him just what scientific laws and facts were involved in any possible solution of the problem. Baille and Reis both taught him to use a vibrating transmitter-diaphragm, which should take the exact movements of the sound-wave; and both taught him to use a vibrating receiver which should execute exactly the same kind of vibrations as the transmitter. Both taught him clearly and plainly that to reproduce the same vibrations in the receiver that were originally produced in the transmitter by the action of sound itself as a motive power, was to reproduce the same sound uttered into the transmitter. Both indicated to him the electric current as the connecting medium between the transmitter and the receiver. Reis pointed his attention directly to the graphic representation of sounds by curves, and to its importance in studying the question of speech-transmission. And, finally, Reis called his attention to the necessity of reproducing variations of *loudness* as well as *pitch*, and explained a *receiver* which theoretically, ought to be able to do this; and Baille and Bourseul suggested a receiver having a plate or "disk" set into vibration by an electric current traversing an electro-magnet whose poles would alternately attract and repel the plate or disk—*in substance, the receiver now in general use for telephonic purposes.*

With this very valuable information, Mr. Bell commenced to reason for himself on the great subject. Bourseul and Reis had both failed to practically achieve the desired result. There was some error somewhere, either in their theories or their instruments. Reis' theory, however, was strictly scientific and logical. Where was the error ?

Sooner or later, Mr. Bell reached the mental suspicion that their broken current was wrong, and that Reis' attempt to reproduce vibrations of varying amplitude and rate *first in the receiver instead of first in the current itself*, was wrong; and he conceived the great idea of producing *electric vibrations* on the line, and making these electric vibrations first copy, *in electricity itself*, the exact characteristics of the sound waves constituting the sounds to be transmitted. He conceived that if he could get A CURRENT *which would be an exact copy of the sound waves*, then, with any suitable receiver capable of responding to such current, he ought to get an exact copy of the sound.

As early as the fall of 1874, he says, he conceived of an apparatus which he thought ought, at least theoretically, to copy sound electrically at any distance. This apparatus, as he then mentally conceived it, was to be provided with a transmitting and a receiving diaphragm, each having an armature attached, and each armature was to be arranged in front of the polarized pole of an electro-magnet in the line; in which case, he reasoned, the vibration of one of the diaphragms and its armature, by sound waves, ought to excite induced magneto-electric currents forward and backward along the line wire, which currents ought to act through the other electro-magnet, at the distant end of the line, to vibrate its armature and connected diaphragm; and the vibrations of the receiving diaphragm, thus caused, ought to be exact copies of the vibrations of transmitting diaphragm.

But, as soon as he conceived this apparatus, he conceived also the belief that it would not operate practically to reproduce an audible sound, by reason of the exceeding feebleness of the minute currents that would be induced by such infinitesimal vibrations of the armature as would necessarily be caused by mere sound waves; and he abandoned the conception as soon as it occurred to him, and, although he had the batteries, wires, and other devices requisite for testing the question, right present to his hand, in his various multiple telegraph instruments, so that a test would not have required one minute of time, nor the outlay of one penny (see C. Vol. 2, p. 1607, Ans. 245–347); yet he never thought the plan worth even an experiment, but turned from it to dreaming of producing the desired result by Helmholtz' plan of *synthesis*. It was this latter plan (synthesis) that he described on March 18, 1875, to Prof. Henry, at the Smithsonian Institute, and which the latter pronounced "the germ of a great invention." (C. Rec., Vol. 1, p. 126.)

On June 2, 1875, while experimenting upon his multiple telegraph invention, he accidentally discovered that the induced currents caused by feeble vibrations of an armature in front of the polarized pole of an electro-magnet, were far stronger than he had believed; and at once his mind recurred to the conception of the previous fall, and he determined now to test the question. He ordered his assistant, Watson, to make him a pair of instruments for that purpose. One of these instruments was completed on July 1, 1875, and the other a few days afterward. They were tested many times in July, 1875, and failed to give him the desired sound reproduction. At the end of July he was thoroughly discouraged, discharged his assistant, and abandoned his experiments—both he and his assistant being ill, apparently from anxiety and disappointment.

Mr. Bell then went off by himself and thought over the whole line of his experiments and theories for several weeks. The result was, that he became more firmly convinced than ever that his *theory* was right, whatever failure there might have been in his *instruments;* and he wrote the letter of August 14, 1875, to Gardner G. Hubbard, in which he proposed to patent his conception of the *induced magneto-electric current,* without waiting to invent apparatus by which it could be utilized on actual telegraph lines, but leaving that for "the future" to "discover."

Soon afterwards, he set about the work of drawing up the specifications for his patent of March 7. 1876, and this work occupied him a large part of the fall of 1875. He filed the application on February 14, 1876, and the patent issued three weeks later.

Mr. Bell's theory of sound-copying electrically is set forth in this patent so clearly and fully that it can hardly be misunderstood by a careful reader.

The patent embraces two distinct and different matters or subjects of invention, viz., first, the multiple telegraph which he *had* invented and practically demonstrated by experiment, and which was, therefore, the proper subject of a patent; and secondly, his plan or proposed theory of a *current* for electrical sound copying, which he had *not* been able to demonstrate by experiment nor to embody in an operative apparatus, and which, therefore, was not the proper or lawful subject of a patent under our statutes.

There can be no misunderstanding of the patent if, while reading it, these two separate and distinct subject-matters are clearly discriminated and their essential differences kept in mind.

The patent was, primarily, for the multiple telegraph. That invention had been completed, and, moreover, Mr. Bell's financial backers believed it to be commercially valuable, while they discouraged and almost forbade his telephone experiments, because they did not believe a telephone to be of any commercial value, even if it should ever be found practicable.

But Mr. Bell, himself, believed that the telephone would be of the greater importance, if it should ever be invented, and he believed that he had correctly reasoned out the law upon which it would be found to operate. He therefore, adroitly introduced into his multiple-telegraph patent an incidental statement of his telephone theory, and carefully constructed the *fifth* claim to cover that theory.

His specification commences with a reference to his two previous multiple-telegraph inventions, which acted, in the one instance, by abrupt breaks of the current, and in the other instance, by abrupt changes of its quantity or intensity. He then points out how these two inventions had been found to successfully transmit only a limited number of signals simultaneously, because the current impulses were liable to overlap each other and form a continuous, unvaried impulse incapable of being analyzed by the tuned receivers—illustrating his explanation by the *straight* lines or dashes of figures 1, 2 and 3, of the patent drawings. He then states that by *undulating* or *gradually* varying the electric impulses on the line, this troublesome overlapping can be overcome, because the *gradually* varied impulses would be graphically represented by *curved* lines, and the curves of different signals never would neutralize each other, but, on the contrary, would only form a resultant curve which would show the elements of all its constituent curves, and which elements the tuned receivers would pick out and reproduce, so that each receiver would respond only to its own transmitter. Inasmuch as differences of *pitch* are all that is required for a multiple telegraph, while the *gradual* variation of the pitch impulses is all that is necessary to prevent them from overlapping and obscuring each other, *any* form of gradually varied or "undulatory" current would answer the purposes of the multiple telegraph. (See his Ans. 605, C. Vol. 2, p. 1695.) Hence, he describes both the induced magneto-electric current and the variable resistance current as suitable for *this* purpose, specifying many different ways of producing the required gradual variations of the current, such as vibrating a current-wire in the neighborhood of another wire, rotating a cylinder having bar magnets upon it in front of the poles of an electro-magnet, vibrating the plates of the battery in the acid, vibrating the conducting wire in mercury or some other liquid, etc., etc. And he claims his multiple-telegraph inventions, broadly, in the first four claims of the patent.

But, while describing and claiming all forms of undulatory current for his multiple-telegraph, he points out that for sound-copying or telephony, *only one of these undulatory currents*, to wit, the *induced magneto-electric form of current*, is available, because it is the only form of current capable of being thrown into *vibrations* which are *the exact electrical representatives of the air vibrations constituting sound.* It must be remembered that, on this subject, he was *merely theorizing or reasoning*, because he had never been able to demonstrate his proposition; and that his theory was that the characteristics of the air-waves must be copied and reproduced first *in the current itself*, preparatory to copying them into the motions of the receiving instrument.

We already seen that the motions of the air-particles in a sound-wave present *three* characteristics, to wit; the back-and-forth movement, without which there can be no air-wave at all ; the variations of amplitude, which control the loudness of the sound ; and the variations of rate per second, which control the the pitch of sound. Mr. Bell, reasoning that the current itself must be an exact copy of the air movements, was logically confined by his premises to a current which should exhibit these same three characteristics of form, to wit, the current must move *back and forth* like the air-particles, and its back-and-forth movements must vary in amplitude and rate. With *such* a current, there seemed no reason to doubt that any sounds or noises could be electrically copied and reproduced at any distance; *with any other current*, some one or more of the three characteristics or essential elements of the air-movements would *fail to be represented* (as was the case with Bourseul and Reis), and there was, theoretically and logically, no reason then to believe that the receiver could be made to vibrate exactly as the air vibrated at the transmitting instrument. Reis' failure had demonstrated the difficulty of attempting to translate remotely resembling current peculiarities, such as variation in the length of the breaks, into correct receiver-movements; and Bell reasoned that the current-peculiarities must *directly* and *exactly* conform to the peculiarities of the air-vibrations.

This was his theory of the possible speaking-telephone, *and it confined him to the induced magneto-electric current*, as the only current which could change polarity or direction of motion with each rapidly succeeding sound impulse.

This theory he sets forth clearly in his patent, in the following words, the italics being our own:

"When, therefore, a permanent magnet is caused to vibrate in front of the pole of an electro-magnet an undulatory current of electricity is induced in the coils of the electro-magnet, the undulations of which correspond, *in rapidity of succession*, to the vibrations of the magnet, *in polarity to the direction of its motion*, and *in intensity* to the amplitude of its vibration.

* * * * * * * *

"Electrical undulations *induced by the vibrations of a body capable of inductive action, can be represented graphically by the sinusoidal curve which expresses the vibration of the inducing body itself and the effect of its vibration upon the air*, FOR as above stated, the *rate* of oscillation in the electrical current corresponds to the rate of vibration of the inducing body—that is, *to the pitch* of the sound produced; the *intensity* of the current varies with the amplitude of the vibration—that is, with the *loudness* of the sound; and the *polarity of the current corresponds to the direction of the vibrating body*—

that is required for a multiple telegraph, while the *gradual* variation of the pitch impulses is all that is necessary to prevent them from overlapping and obscuring each other, *any* form of gradually varied or "undulatory" current would answer the purposes of the multiple telegraph. (See his Ans. 605, C. Vol. 2, p. 1695.) Hence, he describes both the induced magneto-electric current and the variable resistance current as suitable for *this* purpose, specifying many different ways of producing the required gradual variations of the current, such as vibrating a current-wire in the neighborhood of another wire, rotating a cylinder having bar magnets upon it in front of the poles of an electro-magnet, vibrating the plates of the battery in the acid, vibrating the conducting wire in mercury or some other liquid, etc., etc. And he claims his multiple-telegraph inventions, broadly, in the first four claims of the patent.

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"Electrical undulations *induced by the vibrations of a body capable of inductive action, can be represented graphically by the sinusoidal curve which expresses the vibration of the inducing body itself and the effect of its vibration upon the air*, FOR as above stated, the *rate* of oscillation in the electrical current corresponds to the rate of vibration of the inducing body—that is, *to the pitch* of the sound produced; the *intensity* of the current varies with the amplitude of the vibration—that is, with the *loudness* of the sound; and the *polarity of the current corresponds to the direction of the vibrating body*—

that is, to the *condensations and rarefactions of air produced by vibration.* HENCE, the sinusoidal curve A or B, Fig. 4, represents graphically the electrical undulations *induced* in a circuit *by the vibration of a body capable of inductive action.*

"The horizontal line *a d e f*, &c., *represents the zero of current.* The elevations *b b b*, &c., indicate impulses of *positive* electricity. The depressions *c c c*, &c., show impulses of *negative* electricity. The vertical distance *b d* or *c f*, of any portion of the curve from the zero line expresses the intensity of the *positive* or *negative* impulse at the part observed, and the horizontal distance *a a*, indicates the duration of the electrical oscillation."

It will be observed that the above extract describes the *induced magneto-electric current* as capable of being represented graphically by the same sinusoidal curves that would express the vibration of the inducing body itself, and the effect of its vibration upon the air, or in other words, that would express, as Reis had previously shown, the motions of the air-particles in a sound-wave. This assertion he confines expressly to the *induced* vibrations of a *magneto-electric current*, and he nowhere makes the same or any similar statement as to any other form of current. Indeed, he could not make it of any other form of current, for he gives the *reasons* why it can be so represented, and one of the three reasons clearly stated is that its *direction* of movement corresponds to the *direction* of movement of the air particles, that is. "to the condensations and rarefactions of air," which statement is true only of the induced *magneto-electric* current.

Then, passing to a description of Fig. 7, which is alone intended to illustrate this theory of sound-copying, he states that it is an apparatus in which the current impulses are developed by the vibration of an armature in front of the poles of an electro-magnet—that is, it is an *induction* apparatus, producing a *magneto-electric* current.

Describing how the vibrations of its transmitting armature and diaphragm, under the motive power of sound, induce undulations of electricity (magneto-electric electricity) in the line, he then says:

"These undulations are *similar in form to the air vibrations* *caused by the sound—that is, they are represented graphically by similar curves.*"

He had already described that the only undulations which *could* be represented graphically by curves similar to those of the air vibrations, were induced *magneto-electric* undulations, because, among other things, *they alone exhibit alternate reversals of polarity or direction corresponding to the alternately reversed direction of movement of the air particles.* He now explains that this is the same thing as *similarity of form.*

And, finally, he claims:

"5. The method of and apparatus for *transmitting* vocal or other sounds telegraphically, *as herein described,* by *causing electrical undulations similar in form to the vibrations of the air accompanying the said vocal or other sounds,* substantially as set forth."

Notice here, that this claim begins with "transmitting" and ends with the *undulations* on the line—it does not include the *receiver,* but only the *current* excited by a particular "apparatus" (that of Fig. 7), and exhibiting a particular kind of "undulation" on the line. In other words, it is a claim for a *current,* or *effect,* produced by a particular instrumentality.

But *what* current? He answers, in the claim itself, a current whose "undulations" are "similar *in form* to the *vibrations of the air accompanying the said vocal or other sounds.*"

When are current "undulations" thus similar *in form* to sound vibrations? He answers, on the preceding page, that *it is when they can be represented graphically by similar curves.* "These undulations are similar *in form* to the air-vibrations caused by the sound—*that is,* they are represented graphically by similar curves."

But *when* are electric undulations capable of being represented graphically by curves similar to those representing the air-vibrations? He answers this question four pages back in the printed specification, by stating that *it is when* they are *induced* (as in Fig. 7) *by the vibration of a body capable of inductive action,* giving his reasons in full for the statement, *which reasons, as we have shown, apply to no other current except the induced magneto-electric current.*

And this is his whole theory of speech-transmission, or sound copying, by electricity, as set forth in his patent of March 7, 1876. Fig. 7, of the patent was not a picture of any apparatus he had ever produced, but was only an electrical diagram designed merely to illustrate his theory. (See Bell, C. R. Vol. 2, pp. 1620, 1696, Ans. 392, 395, 608.) He had never been able to produce an operative apparatus; the whole thing was mere theory and reasoning. He was endeavoring to claim and patent *the magneto-electric current* for sound copying.

That this was his purpose, we have his own clear, positive and definite statement, in his letter to Gardiner G. Hubbard, dated August 14, 1875, after he had completed all his telephone experiments that were made prior to the date of this patent, and just before he commenced to prepare his specifications. That letter is printed in C. Rec., Vol. 2, p. 1675, and italicized in part by ourselves, is as follows:

"SALEM, MASS., August 14, 1875.

"DEAR MR. HUBBARD:

"*On glancing back over the line of electrical experiments,* I recognize that the discovery of *the magneto-electric current generated by the vibration of the armature of an electro-magnet in front of one of the poles,* is the *most important point yet reached.* I believe that it is the key to *still greater things.*

"The effects produced, though slight in themselves, appear to me so great in proportion to their cause, that I *feel sure* that *the future will discover means* of utilizing *currents obtained in this way* on actual telegraph lines.

"So important does it seem to me to *protect the idea,* that I think some steps should be taken immediately towards obtaining a *caveat or patent for the use of a magneto-electric current,* whether obtained in the way stated above (by the vibration of permanent magnets in front of electro-magnets), or in any other way. I should wish to protect it specially as a means of transmitting simultaneously musical notes differing in intensity as well as in pitch.

"I can see clearly that *the magneto-electric current* will not only permit of the actual copying of *spoken utterance,* but of the simultaneous transmission of *any* number of musical notes(hence messages) without confusion.

"The more I think over it the more I see that the method is making and breaking contact so many times per second, of only the first stage in the development of the idea.

"*When we can create* a pulsatory action of the current, which is the *exact equivalent* of the aerial impulses, we shall certainly obtain exactly similar results. Any number of sounds can travel through the same air without confusion, and any number should pass along the same wire.

"It should even be possible for a number of spoken messages to traverse the same circuit simultaneously, for an attentive ear can distinguish one voice from another, although a number are speaking together.

"Don't you think it would be well to take out a *caveat* for the use of *the magneto-electric current?*

"*In its present undeveloped state*, it might be unwise to let Gray know anything about it, unless, indeed, we could secure the *principle* of it in a patent.

"Yours respectfully,
"A. GRAHAM BELL.

"GARDNER G. HUBBARD, Esq.,
"*Cambridge.*"

The proclamation here made of his purpose to patent the "idea," "principle," or *induced* "*magneto-electric current,*" "in its present undeveloped state," without waiting to discover the "means" by which it could be usefully applied, but leaving it for "the future" to discover such means, found its exact and literal fulfillment in his patent of March 7, 1876.

It will be observed (see Bell's Ans. 560, C. Vol. 2, p. 1674) that after completing all his experiments in July, 1875, and failing to get any satisfactory or even encouraging result, ("The results were unsatisfactory and *discouraging*"—London Lecture) he took two weeks to review (or, as he says, "think and ponder over") the whole matter before writing his letter of August 14, 1875, which commences with the words, "On glancing back over the line of electrical experiments," etc., and then as the result of that review, he settled down definitively and finally upon the theory and belief that the magneto-electric current induced by the vibration of an aramature was the most important thing yet discovered, and was the "principle" that lay at the bottom of sound-transmission.

Prior to that time, he had had, on two occasions, a glimmering and transient conception that possibly other forms of current might be found available. One occasion was on May 4, 1875, when he wrote his letter about the possible effect of varying the tension of a piano-string. But he tried an experiment with Don Fenellosa's piano to determine the matter (see C. Rec. Vol. 1, pp. 134–5, Ans. 68; Vol. 2, pp. 1610, 1611), *and the experiment was a failure*, and probably served to divert his mind from any further attempts in that direction. The other occasion was on July 7, 1875, when he wrote his letter of that date: but, *as he found magneto-electric currents to be present on the line*, even when the battery current was used to polarize the electro-magnet, he settled upon the induced magneto-electric currents as the effective agent. And, upon reviewing and "pondering over" the whole line of electrical experiments, during the two weeks before writing his letter of August 14, 1875, he cast aside all other methods and currents as incompetent to fulfill the conditions necessary for producing an *electrical copy* of the three indespensable constituent elements of a sound wave, and settled down, finally and permanently, upon the induced magneto-electric current as a prime necessity. Although his experiments with this current had been "unsatisfactory and discouraging," that fact did not lead him to try any other current, so little thought had he that any other current *could* do the work required. And as for the magneto-electric current, while his *experiments* discouraged him from any further attempt to produce an apparatus for utilizing it, his *reasoning*, from his knowledge of the three essential elements of sound-waves, convinced him more and more that *this* current involved the exact principle required for the future telephone. We have only to refer to the patent itself for a clear statement of this reasoning, and, as we read it, we see beyond doubt that his premises forced him straight to the magneto-electric current, as the only current capable of fulfilling all the conditions required.

When we reflect that the whole matter lay, as yet, in reasoning and theory, we can only admire the logical accuracy of his mental conception of a current which should, in its three movement-characteristics, exactly copy the three movement-characteristics of the sound-waves, omitting none, and giving all equal prominence. Reis had reasoned accurately, but he sought to get the results only in his reciver; Bell went one step further back, and sought to get them first in the current itself, feeling sure that the future would discover the means of utilizing them if once they were there. The error of Reis lay in trying to convert remotely analogous current-impulses, into the three necessary vibrational characteristics of the receiver; the merit of Bell lies in the fact that he went *one step further back*, and sought to get the three necessary characteristics directly and exactly reproduced in the current itself, before it reached the receiver. The misfortune of Bell was, that he attempted to patent the "principle" while it was as yet a mere theory, and that the subsequent discoveries of other inventors have demonstrated the fact that it is not absolutely essential to have the *three* characteristics in the *current*, but that the characteristic of to-and-fro motion *can be safely left to the receiver*. Reis left the two characteristics of varying amplitude and to-and-fro motion to the receiver, but this was going to far. Bell sought to produce a current that left *nothing* to the receiver except to literally copy the current movements in direction, amplitude and rate; and subsequent experience has demonistrated that *such* a current, although *theoretically* the only perfect current for sound-transmission, is not the only current capable of doing the work.

But his patent, in its statement of the theory, and of the reasons therefor, and in its claim of the theoretical current, limits him strictly to the magneto-electric current—*the only current believed by him, on February 14, 1876, to be capable of the desired result.*

PART III.

WHAT BELL LEARNED FROM GRAY.

On the same day that Bell filed his application, February 14, 1876, Elisha Gray filed a caveat describing and claiming another and different current, to-wit: the variable-resistance current, for transmitting and reproducing articulate speech. An interference was declared *five days later* (Feb. 19, 1876) between this caveat and Bell's application; and, on Feb. 25, 1876, this interference was dissolved on a technicality, and Bell's application was examined and allowed on March 3, 1876, and patented March 7.

Bell, on learning of the interference, went to Washington, *arriving there, as he states, after the interference was dissolved, and being there the first few days in March* (See Bell, C. Vol. 2, p. 1,629, Ans. 404; also his preliminary statement, *ante*, p. —). Upon arriving at Washington, he had the famous interview with Examiner Wilbur, which he describes in his answers 251–256. (C. Vol. 1, pp. 195–197.) *He went* to this interview with the knowledge that the caveat interfered with the first, fourth and *fifth* claims of his application—in other words, that it was a caveat for an undulatory current of *variable-resistance* form, and was to be used for *sound-copying* by electricity. (See Declaration of Interference, C. Exhibits, p. 14.) *He came away from* this interview with the further knowledge *that the particular instrumentality which conflicted was a wire dipping in liquid*, and that the caveat liquid was *water*. "I therefore knew *that it had something to do with the vibration of a wire in a liquid. I do not now remember what it was that led me to suppose that that liquid was water.*" (Ans. 251, C. Vol. 1, p. 196.) In other words, he admits, in substance, that he obtained from the whole proceeding, the information *that the caveator proposed to copy and reproduce sound electrically by varying the resistance of a current, by means of a wire dipping in water!*

This was startling information! It is disclosed to him, in an instant, that the caveator proposed to solve the question of speech-transmission *not* by the magneto-electric current, but by *another and different current*, to wit: a current of *only one polarity*, and therefore capable of copying only two of the three characteristics of sound waves. Could *such* a current do the work? If it could, his own theory, which he was trying to patent, was wrong in one of it essential postulates. It was too important a matter to leave in doubt. He had dismissed his electrical assistant, Watson, seven months before, and had not made a telephone experiment since. His electrical work had been again resumed upon his *autograph-telegraph* (C. Vol. 2, p. 1666, Ans. 534). But everything else must now be laid aside to investigate this other mode of speech-transmission proposed by the caveator! Mr. Bell hurried back to Boston, called Watson again into his employ, and *resumed telephone experiments*, directing Watson *to made a liquid transmitter, having its wire dipping in water* (for the evidence, see *ante*, pp. ——), and with this new transmitter and current, on March 10, 1876, for the first time in his life, he heard sounds and even words and sentences, reproduced electrically. *The words, with the date, were written down in a book and laid away for future use.*

Up to this time all had been theory. Fact now took the place of theory. The information derived from Gray's caveat had changed the whole situation. Bell now, for the first time in his life, *knew* by actual demonstration *exactly* what must exist in the current in order to transmit speech; and *knew* that the magneto-electric current was not the only available form of current, and that the to-and-fro movement of the *current*, corresponding to alternate condensations and rarefactions of air, was not a necessary element. *In other words, the Gray caveat, and the experiment made in consequence of it, changed the whole theory.* By Bell's previous theory, the process consisted in using one special current, having three material ingredients of form. By Gray's theory, the process consisted in using another and different current, having only two material ingredients of form. The two processes could be carried into effect only by means of essentially different apparatus, having different modes of operation and different results. *For multiple telegraph purposes, Bell, even in his patent, had recognized the induced magneto-electric current and the variable resistance current as different inventions, by making his second and third claims to cover the one, and his fourth claim to cover the other.* But he had limited his fifth claim, for sound copying, to the former "method" or current, when excited by induction by the direct motive power of sound acting through a particular "apparatus" shown in Figure 7; and it was now too late to change the patent, for it had been issued three days prior to the dawning of the new light.

The speech obtained through Gray's transmitter on March 10, 1876, had not, however, been by any means perfect, as we infer from Watson's testimony (C. Vol. 1, pp. 309–320). Mr. Bell probably reasoned that if speech could be imperfectly reproduced by means of a current having only two of the three characteristics of the air movements, it ought to be perfectly reproduced by his ideal magneto-electric current having all three of said characteristics. Hence, he immediately resumed experiments on his own current, by having a new set of magneto instruments made and tested. These instruments were not like his unsuccessful instruments of July, 1875, but, curiously enough, are almost literal copies of Gray's caveat *receiver*. The armatures were of the size and shape of the thumb-nail, made of thin clock-spring, and cemented to the center of the diaphragms. The new instruments were completed about the first of April, 1876, and then, for the first time in his life, he heard speech *through his own current*, by means of induction instruments. These instruments did not perform as well as he believed possible; and he further improved them during the summer and fall, and patented his *telephone* on Januarary 30, 1877, no longer seeking a patent on a mere intellectual theory or "principle," but upon the mechanical combinations employed in the work.

In his London lecture, delivered in October, 1877, (C.

Exhibits pp. 879–910, and see particularly pp. 899–901). Mr. Bell gave what purported to be a history of his invention, *in which he connected his apparatus and experiments of April, 1876, directly with his experiments of July, 1875,* without mentioning the long interval that occurred between them, *and without alluding to the important and decisive intervening experiment with Gray's current and transmitter, on March 10, 1876! In his testimony in the Dowd case, in 1879, where the question of Gray's priority was directly in issue,* he was equally silent as to the March 10, 1876, experiment and demonstration. Yet that was the first occasion on which he ever heard speech electrically transmitted, and he had a record of the very words and date. How strange that he should omit to mention that great fact?/ How suggestive that there was *something there to be concealed in his own interest.* Human conduct could hardly afford stronger evidence of the fact! *Mr. Bell knows how to be silent when "silence is golden!"*

PART IV.

FOUR STARTLING REVELATIONS.

First Revelation.

We have already pointed out that, at and after the demonstration of electric speech on March 10, 1876, it was too late to amend or change the patent, which had issued three days before.

But after Mr. Bell was informed of Gray's new theory, and before he had time to determine by experiment whether Gray was right or not, it was not too late to amend the application so as to broaden its possible construction.

The new theory of Gray was not, philosophically, so perfect as that already stated in the application. Moreover, it had not been tested, and the test might prove it unsound. Whatever amendments were to be made should, therefore, be *very cautiously stated*, or they might introduce into the patent an element that, in the future, would prove undesirable.

Mr. Bell reached Washington some time between February 25 and March 1. The interference had been dissolved (on February 25) when he arrived there. (C. Vol. 2, p. 1629, Ans. 404.) He was there in the latter part of February (C. Vol. 1, p. 195, Ans. 251) and the first two or three days of March (C. Exhibits, p. 1010). The application was completed and passed for issue on March 3. (C. Exhibits, p. 31,). This gave opportunity for such an amendment while he was there, and before the application was passed for issue.

The specification, as filed on the fourteenth of February, 1876, had been written in September and October, 1875, with the greatest labor and care (see C. Vol. 1, pp. 152–158), and only completed early in January, 1876, (C. Exhibits, p. 1010). It had been "*written and rewritten a number of times*" and "*that mode of expression that seemed to me best to explain my invention, and the relation that one part of it bore* *to another,*" had been carefully chosen (Bell, C. 2, p. 1620, Ans. 394). But when the new light dawned, at the Wilbur interview, "that mode of expression" *was suddenly discovered to be inadequate,* and an amendment was filed on February 29, 1876, (C. Exhibits, pp. 16, 17) which introduced new matter, and was evidently intended to render the document more elastic. The new amendment introduced "for distinction's sake," the term "pulsatory," and made the quality of "*gradually*" increasing and decreasing the *intensity* of the current the distinguishing quality of the so-called "undulatory" current. It struck out the word "alternately" from the *fourth* claim, and substituted the new distinguishing word "gradually" in place of it; and, *for the first time,* it made the specification declare boldly that "intermittent or pulsatory and undulatory currents *may be of two kinds, accordingly as the successive impulses have all the same polarity, or are alternately positive and negative.*" It shaded off the meaning of the term "undulatory" as clearly defined before, by declaring that it is used only "in contradistinction to the terms 'intermittent' and 'pulsatory'"—*an exceedingly significant and important change af statement.* It did not, however, attempt to restate the theory of electric speech-transmission, nor to alter the statement that, *for such purpose,* the magneto-electric current, with its alternations of polarity, alone contained the necessary conditions. Such an attempt would have been too bold and hazardous to be openly made at that stage of the case; and, besides, Mr. Bell was not yet convinced that his theory of speech-transmission needed any change, nor that a change to include the new theory proposed in the caveat would be desirable even if it could be introduced.

But the sudden necessity, on February 29, 1876, of altering and adding to "that mode of expression" which had been so carefully studied out and which, *up to that time,* had "seemed to" him "best to explain" his "invention and the relation that one part of it bore to another," is strongly significant that the caveat was bearing fruits in his mind.

It is plain that the patent does not read as it would have read had Gray's caveat never been filed.

Second revelation.

But a more startling fact appears in the record, *to wit, that Pollok & Bailey, Mr. Bell's attorneys, had an underground railroad in operation between their office and Examiner Wilbur's room in the patent office, by which they were enabled to have unlawful and guilty knowledge of Gray's papers as soon as they were filed in the Patent Office!*

Let us go back a year, to the interference controversy that originated in March, 1875, between Gray and Bell, on the subject of Multiple Harmonic Telegraphs, and in which the same attorneys, Pollok & Bailey, had charge of Bell's interests. The interference was declared between March 5, 1875, and March 18, 1875. It had *not* been declared on March 5 (see Bell's letter of March 5, C. Exhibits, p. 971). It *had* been declared on March 18 (see Bell's answer 59, C. Vol. 1, p. 128, referring to his letter of that date, on pp. 125-128). This was the first interference between Bell and Gray (See Gray's cross-answer 102, on page 137 of the original Dowd Record, copied into the Molecular and Overland records).

Any authentic list of U. S. patents (such, for example, as is found in the several Official Gazettes, or in the annual lists published by the government, or in the list of Electric Patents published by the government, all of which are official government publications and matters of general history), wiil show that *Elisha Gray had no patent for any form of Multiple or Harmonic Telegraph till the 20th day of July, 1875*, and that *no patent of any kind whatever was issued to him between 12th day of November, 1872, and the 13th day of April, 1875.*

But on the 25th day of February, 1875, he had several *applications* on file in the patent office, and then pending, for his Multiple or Harmonic Telegraph inventions. One of these was filed April 18, 1874, refiled January 19, 1875, and afterwards patented July 27, 1875, No. 166.096. (See Vol.

2, of the Exhibits in the *original Dowd record*, pp. 615, 649; also patents of Gray, printed in C. Exhibits between pp. 844 and 857.). Another was filed January 19, 1875, and afterwards patented July 27, 1875, No. 166.095 (see Gray patents, C. Exhibits between pp. 844 and 857); and another *filed February 23, 1875*, for an invention whose general features are very clearly stated in Gray's subsequent patent of July 27, 1875, No. 166.094, printed in the original Dowd record, on pp. 577, 578).

These applications were, by law and the rules of the patent office, secret while pending, and no person except the officials of the patent office and Mr. Gray and his attorneys, had any right to examine them, or know their contents, *or even know of their pendency*. They were all in the custody of the electrical examiner, Mr. Z. F. Wilbur, whose duty it was to examine and act upon them officially, and to guard their secrecy.

Between the 23d and 25th days of February, 1875, Pollok & Bailey, Bell's attorneys, obtained complete knowledge of the contents of these pending applications, from which knowledge they shaped Bell's whole future course in the Harmonic Telegraph matters, and even caused him to prepare and file three new applications himself, to wit, one on February 25, 1875, one on March 6, 1875, and one on March 10, 1875! This startling information we get from a letter written by Bell to his parents on March 5, 1875, (C. Exhibits, pp. 969–972), as will appear by the following extract therefrom, commencing on p. 970:—

"In regard to the patents, my lawyers, Pollok & Bailey, found, *on examination at the patent office*, that I *had developed the idea so much further than Gray had done* that they have applied for *three distinct patents, in only one of which I come into collision with Gray*. The first patent covers the principle of 'Multiple Telegraphy,' basing my claim upon the instruments exhibited. (These instruments require *two* lines, an up line and a down line.)

"The second patent covers the principle of using an *induced current*, so as to permit a single wire to be employed.

"The third patent is for a 'vibratory circuit-breaker,' for the purpose of converting the vibratory motion of my receiving instruments into a permanent *make* or *break* of a local circuit.

* * * * *

"Another fortunate circumstance was this. That the very examiner into whose hands this will come *happened to be in Mr. Pollok's office one day when I called,* so that I had a long interview with him, in which I explained everything to him, and I can't help thinking that he must have been convinced of my independent conception of the whole thing.

"After making out our specifications and examining into the whole thing Mr. Pollok said, 'You have a good case.' The last words he said when I left were, 'You need not fear, we shall pull you through all right.'

"Whenever Gray's lawyer heard that I was in town *he applied to the patent office to complete Gray's patent, and thus force me to a law suit.*

The examiners, however, *could not act in the matter for ten days, so that gave me time to get my application in* in time. I am now waiting for the decision of the examining board. *They will probably declare an interference.* Then I shall have to have witnesses examined and prove priority.

"The invention could not have come out at any better time than the present."

And then he explains why and how their present *great importance* had come to his knowledge, to wit, through the discovery of its enormous probable effect upon the struggle then going on between the Western Union and the Pacific telegraph companies for the monopoly of rapid telegraphing. The written contract between Bell, Sanders and Hubbard, by which the latter two gentlemen were to furnish money and have an interest in Bell's inventions, was executed Feb. 27, 1875 (C. Exhibits, p. 972), two days after the first of the three applications was filed as above stated—the whole business apparently having received a sudden impulse, from its recently discovered immediate importance to the rival telegraph companies.

But what an infamous proceeding is revealed in this letter of March 5, 1875, with all its professions of honesty. The clear meaning of it is this: *On the very day that Gray filed his last application, or the next day after,* Pollok goes to the patent office, *and examines all of Gray's papers*, so that he is enabled *to determine exactly what Gray had done and to compare it with what Bell had done.* Pollok then prepares three applications for Bell, *one of which was to tie up Gray in interference, while the others were to steer clear of Gray and come out in patents before Gray could get out of the interference*—in which case Bell, and not Gray, could probably secure the patronage of the telegraph company. Gray's attorney was pressing his client's applications (Pollok and Bell had no right to know *this*), but the examiner was induced to *suspend all proceedings on Gray's matters for ten days*, which would give Bell "*time to get*" *his* "*application in in time.*" These things could not have been done by Pollok except with Wilbur's connivance, and they establish beyond all peradventure the existence of a corrupt conspiracy between Pollok and Wilbur to "work" the patent office in Bell's interest. The letter shows that it was not always necessary for Pollok to go to the patent office to consult Wilbur, for the latter was at times to be found and interviewed at Pollok's office.

Bell was asked, in his cross-examination in the People's case, (C. Vol. 2, p. 1600, Cross-Q. 343) what applications he had filed between the summer of 1874 and June 2, 1875, to which he replied:

> "*Ans.* 1. Application, *February 25, 1875.* Multiple telegraphy; circuit-breaking vibrators for transmitters and tuned reed receivers; patent not issued; *in interference with Gray.*
>
> 2. Application, *March 6, 1875.* Vibratory circuit-breaker and autograph receiver. *Patented* as No. 161,709, April 6, 1875.
>
> 3. Application, *March 10, 1875.* Multiple telegraph circuit breaking transmitters used with induction coils; *in interference with Gray;* patent not issued."

The programme was thus carried out, just as arranged by Pollok, except that, by some accident or inadvertence, *or change of plan, two* of Bell's new applications got into interference with Gray, instead of *one*, as had been originally planned. The subject-matters of these three interferences are stated by Bell in his preliminary statement in the Harmonic Interferences (C. Exhibits, pp. 990, 991). Bell knew from the "*examination at the patent office*" just how far Gray had gone, just what to do to head him off and stop him by interference, just how to steer by him without interference, just what motions Gray's attorney was making to advance his client's interests; and the fact that one of his applications, filed to head Gray off, was put into the patent office on February 25, only two days after Gray had filed the application which was to be headed off, shows that he got his knowledge *instantly upon the filing of Gray's applications.*

With a clear knowledge, now, of the corrupt relations existing between Pollok and Wilbur, our minds may well be prepared for the still more extraordinary revelations that are to follow, respecting the application of February 14, 1876, for one of the patents here in controversy.

Third revelation.

This revelation consists of indubitable evidence that an important invention and a claim therefor, were bodily interpolated into Bell's specification, between February 14, 1876, and February 19, 1876, by Pollok, in consequence of the guilty knowledge which the latter already had of the contents of Gray's caveat, before the declaration of interference with Gray on February 19th.

The interpolated claim was the *fourth* claim, which, as then formulated, read as follows:

4. "The method of producing undulations in a continuous voltaic circuit by alternately increasing and diminishing the resistance of the circuit or by alternately increasing and diminishing the power of the battery as set forth."

The interpolated new invention (admitted to be an invention *by the making of this separate claim for it*) was the passage found on the fifth page of Bell's printed specification (see copies of his two patents, printed between pp. 54 and 71, C. Vol. 1), in the following words, to-wit:

"Electrical undulations may also be caused by alternately increasing and diminishing the resistance of the circuit, or by alternately increasing and diminishing the power of the battery. The internal resistance of a battery is diminished by bringing the voltaic elements nearer together, and increased by placing them farther apart. The reciprocal vibration of the elements of a battery, therefore, occasions an undulatory action in the voltaic current. The external resistance may also be varied. For instance, let mercury or some other liquid form part of a voltaic circuit, then the more deeply the conducting wire is immersed in the mercury or other liquid, the less resistance does the liquid offer to the passage of the current. Hence, the vibration of the conducting wire in mercury, or other liquid included in the circuit, occasions undulations in the current. The vertical vibrations of the elements of a battery in the liquid in which they are immersed, produces an undulatory action in the current by alternately increasing and diminishing the power of the battery."

The fourth claim, it will be observed, is one of the four multiple telegraph claims, not sued upon in this suit because not relating to *sound-copying*, but only to the employment of *mechanical* motive-power to set the apparatus in operation. Mr. Bell was not convinced till March 10, 1876, that the variable-resistance current would answer for sound-copying, because it was not theoretically correct in *form*, lacking, as it does, one of the three characteristics of sound-waves. The interpolated passage was drawn to support the interpolated claim. It described a current which was clearly available for multiple telegraphing, whether it was or was not available for sound copying, because "*form*" is "*neither material nor essential*" in a current for multiple telegraphy. (Bell, Ans. 551, C. Vol. 2, p. 1672.) *Gray's caveat* had revealed this new current, and it was seen at once to be clearly available for multiple telegraph purposes, whatever other merits or demerits it might have. *It had never been experimented with by Mr. Bell.* (See his Ans. 177, C. Vol. 1, p. 173, 450; C. Vol. 2, p. 1644.) The description of it was accordingly interpolated *among the multiple telegraph apparatus, in direct sequence after the reference to the rotating cylinder having bar magnets arranged upon its periphery, and other appliances clearly not telephonic.*

How do we know it was an interpolation? Because there is in the record a copy of Mr. Bell's specification, made *before* his American application was sworn to on January 20, 1876, and which was, to wit, on or about January 25 1876, five days *after* the application sworn to, "*handed to*" Hon. George Brown, in New York City, to be taken to England, where Mr. Brown was immediately going, in order to patent the invention there; *and not one word of the interpolated matter is to be found in that copy,* but on the contrary, the positive statements of the copy are *expressly inconsistent,* both scientifically and practically, with such matter, and would not have been allowed to remain in the copy if the matter described in the interpolated passage and claim had been invented by Mr. Bell before Mr. Brown took the copy to Europe.

This copy is found printed in full in C. Exhibits, pp. 936–947. It contains all the drawings of the American patent, including Fig. 7. *It describes the magneto-electric current and appartus alone, both for the multiple telegraph and for sound-copying;* and it states, in express terms, that, although "there are many ways of producing undulatory currents of electricity," yet "*all of them* depend for effect *upon the vibration or motion of bodies capable of inductive action,*"—in other words, that *all of them are magneto-electric.* It then describes the three *magneto-electric* devices *that are described in the patent of March 7, 1876, immediately before the interpolated passage;* after which it proceeds to the description of the drawings, in utter obliviousness of the variable-resistance devices referred to in the interpolation. And, finally, it claims, *in different and alternative forms of claim,* the three *magneto-electric* multiple-telegraph inventions claimed in claims 1, 2 and 3, of the patent, and the sound-copying method and apparatus claimed in the last claim of the patent; but contains no claim in the remotest degree resembling claim 4 of the patent!

The relations of Hon. George Brown, of Toronto, Canada, (deceased before the testimony was taken in these cases) are fully set forth in Mr. Bell's preliminary statement (C. Exhibits, p. 1010), and in Mr. Bell's testimony, (C. Vol. 2, pp. 1676–1683, and p. 1700). During the fall of 1875, Mr. Bell solicited him to take an interest in his inventions and patent them in England. December 24, 1875, Bell visited him at Toronto, interviewed him on the evening of December 28th, and executed a written agreement with him on December 29th, returning to Boston about January 1, 1876. It clearly appears from his testimony (C. Vol. 2, pp. 1679–80) that he was not in Canada again during that winter. It also appears from the testimony of Gardiner G. Hubbard (C. Exhibits, p. 961, Ans. 22,) that *Mr. Brown met Mr. Bell and Mr. Hubbard, in New York City, on or about January 25, 1876,* on this business. Brown immediately proceeded to England *the last week in January*, 1876 (Bell, C. Vol. 2, p. 1682, Ans. 567–8) taking with him the copy above referred to, in order to file it for a patent there. He was to cable Bell when it was filed, but delayed to act in the matter, and Hubbard grew impatient and had the American application filed, February 14, 1876, without waiting further to hear from Brown. The copy in question was not sent by mail to Brown, but was "*handed to*" him at some time between December 29, 1875, and the time he sailed—the last part of January, 1876. (Bell, Ans. 570, C. Vol. 2, p. 1682.) Inasmuch as the interview at New York city, on or about January 25, 1876, was the only time when Brown and Bell were together between December 29, 1875, and the time of Brown's sailing, *that* must have been the occasion when the copy was "handed to" him; *and that was five days after the American specification had been sworn to.* Brown's endorsement on it shows that it was given him shortly before he left for England, (C. Ex., p. 944.) Hubbard testifies that Mr. Bell was very solicitous to have the patents "*taken out in his native country, that he might there have the benefit of what he believed to be a great invention.*" (Hubbard, C. Exhibits, p. 961, Ans. 22.)

We have, therefore, the extraordinary spectacle of Mr. Bell's handing to George Brown, on January 25, 1876, the eve of his departure to Europe, a specification of this "great invention," to be filed and patented there, which specification not only totally omitted the entire description of the variable-resistance current and the claim based upon it, but declared in express terms that *all* "ways of producing" what he then knew as "undulatory currents of electricity" "*depend for effect upon the vibration or motion of bodies capable of inductive action*," or, in other words, that the *magneto-electric* current was the only current known to him that *could* produce this effect! It is simply incredible that this specification should have been put into Mr. Brown's hands after Janury 20, 1876, if his American specification, sworn to on that day, had contained the matter which now appears in it, or Mr. Bell had even known of such new inventions.

The copy given to George Brown had been written in October, 1875. (Bell, Ans. 571, C. Vol. 2, p. 1682.) It contains some erasures and interlineations, but they were made before it was handed to him. (Bell, Ans. 576, C. Vol. 2, p. 1683.) They consist merely of restatements of matters in what was evidently deemed better phraseology.

The American specification was written mainly in September and October, 1875, but the finishing touches were put to it between January 1, 1876, and January 10, 1876. (C. Exhibits, p. 1010; Bell's Ans. 114–115, C. Vol. 1, p. 156; and Hubbard's Ans. 20, C. Exhibits, p. 960.) These finishing touches evidently consisted in correcting the phraseology substantially as it appears to have been afterwards corrected in the George Brown "copy."

The American specification was not altered in any respect between January 10, 1876, and February 14, 1876, as we know by Mr. Bell's repeated statements. It was sent to Washington by the hand of Mr. Hubbard on January 10, 1876, to be examined by Mr. Pollok. (C. Exhibits, p. 960; Bell, Ans. 114, 115. C. Vol. 1, p. 156.) *Pollok made no change in it* (Bell, Ans. 115, p. 156), but *had a fair copy made by one of his clerks*, and returned it to Mr. Bell, at Boston, on January 18, 19 or 20, 1876, and Mr. Bell made oath to it on January 20. (Bell, C. Vol. 1, p. 157, Ans. 119–122.) As soon as it was sworn to, Mr. Bell sent it to Pollok. (Bell, C. Vol. 2, p. 1680, Ans. 563.) It was deemed advisable to go over it once more together with Mr. Pollok, although it had been sworn to, and, accordingly, Pollok came to New York city with it a few days after January 20, 1876, (probably when George Brown met them there,) and a day was spent in "going over it with care," but "*no change whatever was made in it,* and Mr. Pollok took it back with him." (C. Exhibits, pp. 1010, 1011.) This is the last that appears of it till it was filed in the patent office February 14, 1876. We therefore know that it was not altered after January 10, 1876, till it was taken by Pollok back to Washington to be filed, some days after it had been sworn to and after it had received the final scrutiny of Mr. Bell and his attorney—which scrutiny was probably at the very time when the copy was handed to Mr. Brown to take to England.

The following schedule will show the whole history:

American specification written in Sept. and Oct., 1875......	(C. Exhibits, p. 1010.)
Hubbard saw it in Oct., 1875.............................	(C. Exhibits, p. 960.)
Hubbard took it to Washington to submit it to Pollok, about Dec. 1, 1875	(Id.)
and took it back to Boston, Dec. 14 or 15, 1875.........	(Id.)
The patent drawings were made between Dec. 15, 1875, and Jan. 15, 1876	(Bell, C. Vol. 2, p. 1658.)
The specification was completed early in January, 1876.....................	(C. Exhibits, p. 1010.)
And was sent to Washington, January 10, 1876	(C. Exhibits, p. 960.)
Where Pollok went over it again............	(Id.)
But did not change it...	(Bell, Ans. 115, C. Vol. 1, p. 156.)
Pollok's clerk then made a fair copy of it and the copy was sent to Bell for the oath, Jan. 18, 1876...	(Id. Ans. 119, 122.)

It was sworn to Jan. 20, 1876	(Id. Ans. 123.)
And sent to Pollok immediately......	(C. Vol. 2, Ans. 563, p. 1680–1.)
Pollok brought it to New York a few days after it was sworn to, where it was examined by him and Bell with great care for a whole day, but no change whatever was made in it...	(C. Exhibits, p. 1011.)
Brown had his "copy" handed to him between Dec. 29, 1875, and his sailing for England the last week in January, 1876	(Bell, C. Vol. 2, p. 1682.)
And shortly before he left for England............	(C. Exhibits, p. 944.)
The Brown copy was written in October, 1875...	(Bell, C. Vol. 2, p. 1682, Ans. 571.)
Its alterations were made before it was handed to him..............................	(Bell, C. Vol. 2, p. 1683, Ans. 576.)
Hubbard and Bell met Brown in New York City on this business about Jan. 25, 1876.........	(C. Exhibits, p. 961.)
Brown took the copy with him to England the last week in Jan. 1876......	(Bell, C. Vol. 2, p. 1682.)
They waited till Feb. 14, 1876, for Brown's cablegram, and then filed the application......	(Bell, Ans. 124, C. Vol. 1, p. 158.)

Any alteration of the specification between January 20, 1876, (the date of the oath,) and February 14, 1876 (the date of the filing), to include the description of this new variable resistance telegraph and the claim for it as a new invention, *would have necessitated a new oath to the application*, as, otherwise, the patent, if issued on it, would be invalid and void for non-compliance with the law requiring the inventions to be sworn to. Such alteration, if made between January 20 and February 14, would have been innocent, if the subject-matter had been Bell's invention, and would, unquestionably, have been inserted openly and above-board, and the application re-sworn to as the law required; and the testimony of Bell and his witnesses would have shown the fact and, approximately or exactly, the date. But Mr. Bell has been very careful *not* to state when this interpolated matter was inserted, nor why it was inserted, nor why it fails to appear in the George Brown copy, nor why so important an addition, both to the description and claim, was not even attempted to be patented in England, where he was so solicitous of holding both the honor and profit of his "great invention." *In his testimony the whole matter was slipped over in silence*, just as in his London lecture and his testimony in the Dowd case he slipped silently over the first electric transmission of speech on March 10, 1876, with Gray's transmitter, and tacked his April, 1876, experiments directly to his July, 1875, experiments, without alluding to the long time intervening between them or the great discovery demonstrated between them! "Silence," sometimes, "is golden," but it is not always consistent with *veracity*.

The appellees are, therefore, reduced to one of only three alternatives: They must admit that the interpolation was made *between February 14 and February 19*, which renders the patent void; or, secondly, they must admit that it was made *after the specification was sworn to*, on January 20, and before February 14, which renders the patent equally void, and is, besides, totally incredible in view of the fact that a a new oath was never made; or, finally, they must take the incredible position that Bell allowed George Brown to leave for England without copying into his paper this *all important* new matter (which could easily have been inserted in five minutes) although they were together in New York, just before he left, for the purpose of giving Brown his final instructions, and although Hubbard, and probably Pollok, were there with them.

It is incredible that it could have been in the American specification on January 20, 1876, without being copied into the George Brown papers before he left for Europe; and equally incredible that it could have been interpolated between Brown's departure and February 14, 1876, without a new oath, and without being transmitted by first mail to Brown in England for insertion in the English papers; and if the interpolation was innocently made before February 14, 1876, it is well-nigh incredible that Bell, in his testimony, should not have taken pains to explain when and how it first appeared in the American specification, and why it was omitted from the George Brown papers. *The fact that Bell had never experimented upon the matters referred to in the interpolation* (see his Ans. 177, C. Vol. 1, p, 173; 450, C. Vol. 2, p. 1644) is of great significance in this connection, as is also the fact of his repeated declarations that the paper taken by George Brown to England was a *copy* of his American specification. In 1877, when trying to mislead and "bluff" Gray by making him think that the matters in conflict between them had been invented by him long before Gray's invention, he stated in a letter to Gray (see C. Vol. 2, p. 1682, question and answer 566):

> "My *specification* had been prepared *months* before it was filed, and *a copy* had been taken to England, by a friend. I delayed the filing of the American patent until I could hear from him. At last the protests of all those interested in my invention, deprecating further delay, had their effect, *and I filed my application* without waiting for the conclusion of the negotiations in England."

Here the plain intimation to Gray was, that the paper taken to England was a "*copy*" of the "specification" which was afterward "filed" as an "application;" *and we shall see, further on, that this was most indubitably the exact truth,* but that the specification that was "filed" was not the specification that was "*patented*."

We are, therefore, as we submit, fully warranted in the belief that the application, when filed on Feb. 14, 1876, did not contain the interpolated matter; *and that the interpolation was made after knowledge of Gray's caveat, and by Pollok's clerk, in whose handwriting the original application-papers had been written;* and was made with the connivance of the examiner, Wilbur, whose guilty relations with Pollok in respect to the Gray and Bell matters have been already demonstrated from the record. *This conclusion is impregnably established by what now follows.*

Fourth revelation.

Two certified copies, from the patent office, of Bell's application papers in the matter of his patent of March 7, 1876, are in evidence in the record, to wit, one copy, *certified on April 10, 1879* (C. Exhibits, pp. 5–13), and one, *a photograph copy, certified on October 30, 1885.* (Add. proofs, pp. 729-744.)

The specification of the *patent,* as printed and issued March 7, 1876, with the amendments of February 29, 1876, is also in evidence. (C. Vol. 1, occupying the twelve pages, immediately following p. 54.) *We thus have three patent office copies of Bell's Specification,* all of which ought to agree. But here the remarkable fact appears that, while the specification printed March 7, 1876, as a part of the patent, and the photographic *fac simile* of October 30, 1885, agree almost exactly with each other, *neither of them agrees with the certified copy of April 10, 1879!* Yet each, being a certified copy, imports verity, and proves that the record stood as certified, *at the time of its certification.* Hence the legal conclusion is that, on March 7, 1876, the papers appeared *one way,*—on April 10, 1879, *another way*—and on October 30, 1885, *changed back* to correspond to the printed copy attached to the patent.

"But" (The court may inquire), "in view of the fact that the copy of Oct. 30, 1885, is a '*photographic fac simile*' of the paper then on file in the patent office, *as the original Bell specification,* (See Commissioners Certificate, Add. proofs, p. 729,) and that it corresponds exactly with the printed specification attached to the patent on March 7, 1876, must we not inevitably conclude that the differences observable in the certified copy of April 10, 1879, were *errors made* *by the clerk who wrote that copy,* and not detected by the commissioner who certified it as correct?"

Ordinarily, this would be a tenable hypothesis in such a case—*but it is not so here!* The proof is absolutely overwhelming and unanswerable *that the record has been foully tampered with* in the interest of Mr. Bell, *since April 10, 1879! And that it was done to cover up some prior deviltry that was in danger of being exposed as the record before stood!*

We have already stated what we conceive to be unanswerable reasons for believing that the copy taken by George Brown to England, at the end of January, 1876, *was substantially identical with the specification then already sworn to, and two weeks afterwards filed in the United States Patent Office;* and that, so far as the patent of March 7, 1876, disagrees with the George Brown paper, the *patent is a fraud* and the disagreeing matter *an interpolation made after February 14 and before February 19, 1876. The certified copy of April 10, 1879, decisively proves this to be the fact!*

There are *thirty-nine separate statements* in the certified copy of April 10, 1879, which disagree with the statements respectively found at the same places in the patent and in the photographic *fac simile; and every one of those thirty-nine separate statements in the copy of April 10, 1879, is an exact copy of the language found in the same connection in the George Brown Paper!* By no conceivable possibility could such a coincidence have happened by chance. It stands absolutely demonstrated, that when the commissioner's copyist made that copy, on April 10, 1879, he had before his eyes, in the Bell specification *then on file,* the *exact phraseology of the George Brown copy of January, 1876,* which phraseology *has since disappeared from the patent office record,* as is conclusively proved by the *fac simile!* This disappearance could have happened by no accident! The fraud begun in February, 1876, has been finished off by what is substantially a forgery, since April, 1879!

The court can not realize the startling force of this proof, until it compares the thirty-nine passages in the different copies with the George Brown paper.

First, it will find that the 1879 certified copy showed that the original patent office specification *was full of erasures and interlineations*, which are faithfully reproduced, for the most part, in the 1879 copy, *but which fail to appear in the photographic fac simile of 1885*. We should not, of course, expect them to appear *in the patent*, which would only be a copy as corrected; but that they were there in 1879, is clear, and that they are not in the photographic *fac simile*, shows the latter to be a fraud.

Second, it will find that statements appeared in the 1879 copy *which there were strong reasons for Mr. Bell's wishing to disappear; and that they have accordingly disappeared since that date.*

Third, it will find that the thirty-nine passages correspond so curiously to the George Brown copy—*mistakes and all*—that the entire correspondence of the whole original patent office specification with the George Brown copy can no longer be doubted.

Referring to the certified copy of 1879 (C. Exhibits, pp. 6–13), the thirty-nine passages will now be pointed out—commencing with the passages shown as erased and interlined.

1. On p. 6, line 11, the 1879 copy says: "to produce its fundamental note (tone) by one only," etc., etc. The brackets indicate an erasure and interlineation in the record, *as the record appeared on April 10, 1879*. Referring to the George Brown copy, (C. Exhibits, pp. 936–947) we find that the original word was "*tone*," and that it was therefore erased and "*note*" interlined before the patent issued. Both words appeared on the record in April, 1879, only one of them now!

2. On p. 6, line 26, the 1879 copy says: "Over the same circuit (wire)." Brackets again indicate an erasure and interlineation. Referring to the George Brown copy (p. 937), we find that the original word was "*circuit*," and that it was erased and "*wire*" interlined before the patent issued.

As before, *both* words appeared on the record on April 10, 1879, and only one in 1885.

3. On p. 6, lines 31, 32, the 1879 copy says: "My present invention consists in the employment of a vibratory (or undulatory) current of electricity," etc., etc. Here brackets again indicate interlineation.

The photographic *fac simile* (Add. proofs, p. 731,) says simply: "My present invention consists in the employment of a *vibratory* current of electricity." The George Brown copy, on the contrary, says "*vibratory or undulatory*." In 1879, the patent office record, at this point, corresponded to the George Brown copy, and not to the patent office record of 1885. The amendment of February 29, 1876, (C. Exhibits, p. 16) struck out the entire passage and inserted in lieu of it the passage that now appears in the patent, containing the words "vibratory or undulatory," but that is no reason why both words should have appeared as a part of the *original* specification in the record in 1879 and only one of them in 1885.

4. On p. 7, line 3, the 1879 copy says: "simultaneously over (on) the same circuit." Brackets again indicate erasure and interlineation. Referring to the George Brown copy, we find that the original word was "*over*" and that it was erased and "*on*" interlined before the patent issued. As before, both words appeared on the record in 1879, and only one in 1885.

5. On p. 7, lines 5 and 6, the 1879 copy says: "That a closed circuit and single main battery may be used (employed)." Brackets again indicate erasure and interlineation. Referring to the George Brown copy, we find that the original word was "*employed*" and that it was erased and "*used*" interlined before the patent issued. Both words appeared on the record in 1879, only one in 1885.

6. On p. 7, line 8, the word "using" appears in the 1879 copy, but not in the patent nor in the photographic *fac simile*. It *is* found in the George Brown copy, showing that the patent office clerk made no mistake in copying,

but that the word appeared on the record in 1879 and has since been removed.

7 and 8. On p. 7, lines 35 and 36 (second and third from the bottom of the page), the 1879 copy reads: "four impulses of B (A) being made in the same time as five impulses of A (B)." Brackets again show erasure and interlineation. Referring to the patent and photographic *fac simile*, we find them to read: "four impulses of B being made in the same time as five impulses of A." Referring to the George Brown copy, we find it to read: "four impulses of A being made in the same time as five impulses of B." The original patent office specification was, therefore, written the same as the George Brown copy, and the letters A and B were erased and the letters B and A were substituted, respectively, before the patent issued. The record in 1879 showed the erasure and interlineation; the photographic *fac simile* does not. Now, referring to the *drawing* of the George Brown copy (C. Exhibits, p. 946), it will be seen that *the shortest curves are in line B, so that four impulses of A were in fact equal to five of B, as there represented;* whereas the *patent* drawing has *reversed the curves, making the shortest curves in line A*, so that, in the patent, *four impulses of B are equal to five of A*. The original specification filed in the patent office, therefore, *made a mistake of fact by following literally the words of the George Brown copy, without correcting them to correspond to the new drawings*. The 1879 copy shows the mistake and its correction; the photographic *fac simile* shows neither mistake nor correction.

9, 10 and 11. Precisely the same thing occurs again in the last three lines of p. 8, where the letters A and B are shown by the 1879 copy to have been again erroneously used in the original specification, and to have been erased and interlined correctly before the patent issued. The original paper invariably corresponded to the George Brown copy, but the photographic *fac simile gives no hint of the fact*.

12. On p. 8, line 28, the 1879 copy (as also the *patent* and the *George Brown paper*) reads: "The horizontal *line* a d e

f," etc. The photographic *fac simile* (C. Exhibits, p. 735) reads simply: "The horizontal a d e f," etc., omitting the word "*line*." If the specification had read thus in 1876, the patent would necessarily have been printed as the photographic *fac simile* reads. But the 1879 copy and the George Brown copy both show the word "line," and it was undoubtedly in the record *until the fraudulent alteration was made* between 1879 and 1885, when it was *inadvertently* omitted by the author of the fraudulent copy.

13. On p. 10, lines 14, 15, the 1879 copy reads: "And in vibrating it produces (yields) a musical note of a certain definite pitch." Brackets show erasure and interlineation. By reference to the George Brown copy it will be seen that the original word was "*yields*," and that this word was erased and "*produces*" interlined before the patent issued—the record in 1879 showing both words; the record in 1885 showing only one of them.

14. On p. 10, line 23, the 1879 copy reads: "The coil of the *distant* electro-magnet f," etc. The patent and the photographic *fac simile* omit the word *distant*, but the word was visible on the record in 1879, for the same word appears in the George Brown copy.

15. On p. 10, lines 26, 27, the 1879 copy reads: "When the pitches of the two instruments, *A I*, are different." The patent and the photographic *fac simile* omit the capitals "A I" at this point; but their insertion in the 1879 copy was no mistake of the copyist, for we find them at the same point in the George Brown copy.

16. On p. 10, lines 36, 37 (last two lines of the page) the 1879 copy reads: "They continue sounding so long as the mechanical vibration of B^1 is continued, but become silent *the moment its motion stops*." The patent and photographic *fac simile* read as follows: "They continue sounding so long as the mechanical vibration of B^1 is continued, but become silent *with the cessation of its motion*." In the George Brown copy, the words are, "*the moment its motion stops*." The copyist in 1879, therefore, made no blunder, but copied what appeared before him in the record at that

time, *and the record was afterward changed* before the photographic *fac simile* was made in 1885.

17, 18, 19. On p. 11, lines 1, 2, 3, the 1879 copy reads: "The duration of the sound may be used (*made*) to indicate (*signify*) the dot or dash of the Morse alphabet, and thus a telegraphic dispatch may be indicated (*can be transmitted*) by alternately interrupting and renewing the sound." The brackets indicate three separate erasures and interlineations. Referring to the George Brown copy, we find that the words of the specification as originally filed were "*made*," "*signify*," and "*can be transmitted*," and that they were all erased and the other words interlined before the patent issued. Both sets of words appeared in 1879; only one now appears in the record, as shown by the photographic *fac simile*.

20. On p. 11, line 12, the 1879 copy reads: "Simultaneously caused to vibrate (*set in vibration*)." Here, again, brackets show erasure and interlineation Referring to the George Brown copy, we find that the expression was originally "*set in vibration*," and that it was erased, and "*caused to vibrate*" was inserted before the patent issued. Both expressions were visible in 1879, only one of them now.

21. On p. 11, line 20, the 1879 copy reads: "When the armature *c*, Figure 5, is *mechanically* set in vibration;" whereas the patent and the photographic *fac simile* both read: "When the armature *c*, Figure 5, is set in vibration." The insertion of the word "*mechanically*," in 1879, was no blunder of the copyist, for the George Brown copy contains the same word in the same place. But this word, also, was expunged before the photographic *fac simile* was made. *There was a reason for desiring to get clear of this word*—by limiting the armature of Figure 5 to *mechanical* vibration, *it tended either to limit the armature of Figure 7 likewise*, (because Figure 7 is described as an improvement on Figure 5), or else it was totally superfluous.

22, 23. On p. 11, lines 26, 27, the 1879 copy reads: "The instruments A ^{1} and A ^{2} repeat loudly the signals of A, and *instruments* B ^{1} B ^{2} repeat *gently* (softly) those of B." Here, again, erasure and interlineation are shown by the brackets. The patent and photographic *fac simile* state the proposition as follows: "The instruments A ¹ and A ² repeat loudly the signals of A, and B¹ B² repeat *softly* those of B." The insertion of the word "*instruments*" before B¹ B², and of the word "gently" instead of "softly" was no blunder of the copyist, for precisely that form of expression appears in the George Brown copy.

24, 25. On p. 11, lines 31, 32, the 1879 copy reads: "Whereby motion can be imparted to the armature by *means of* the human voice or by (the tones) means of a musical instrument." Erasure and interlineation again. The patent and photographic *fac simile* read: "Whereby motion can be imparted to the armature by the human voice or by means of a musical instrument." The insertion of the words "*means of*" before "the human voice," and of "*the tones*" as originally appearing instead of of "means," was no blunder of the copyist; for the George Brown copy shows the same words that appear in the 1879 copy. They have been removed since the 1879 copy was made.

26, 27. On p. 12, lines 3, 4, 5, the 1879 copy reads: "Undulations are created (caused) upon the circuit E, *b*, *e*, *f*, *g*. These undulations are similar in form to the air vibrations caused by the sound, that is, they are (*can be*) represented graphically by similar curves." Erasures and interlineations again, which do not appear in the photographic *fac simile*. Referring to the George Brown copy, we find that the specification originally read as stated in the brackets of the 1879 copy, and that the words "*caused*" and "*can be*" were erased and "created" and "are" inserted, before the patent issued.

28. On p. 12, line 23 (third line of the second *claim*) the 1879 copy reads: "So that the vibration of the one shall occasion (*produce*) electrical undulations in the other," etc., etc. Erasure and interlineation again. Referring to the George Brown copy (second set of claims) we find that the second claim, as originally filed in the Patent Office, con-

tained the word "*produce*" instead of "occasion," and that the change was made before the patent issued. Both words appeared in the record in 1879, only one of them now.

29, 30, 31, 32, 33. In the claims, as copied in the 1879 copy, the words "substantially as set forth" (first claim), "substantially as set forth" (second claim), "as set forth" (third claim), "of the battery as set forth" (fourth claim), and "substantially as set forth" (fifth claim), are all enclosed in brackets, *showing that they were interlined while the application was pending* in the patent office. *None of these words appear in the George Brown copy. No brackets or interlineations appear in the photographic fac simile of 1885*, showing that the record has been altered since 1879. It will be remembered that the *fourth* claim was bodily interpolated into the application between February 14 and 19, 1876; and the 1879 copy shows that, *as first interpolated*, it ended with the word "*power*," and that the words "of the battery as set forth" were afterward inserted before the patent issued.

34, 35, 36, 37. Turning back once more to page 8, lines 29 to 31, the 1879 copy reads as follows: "The elevations, *b b b* (*c c c*), etc., indicate impulses of positive electricity; the depressions, *c c c* (*e e e*), etc., show impulses of negative electricity; the vertical distance, *b d* (*c d*) or *c f* (*e f*), of any portion of the curve from the zero line expresses the intensity," etc., etc. Here we find erasures and interlineations again revealed by the 1879 copy which do not appear in the photographic *fac simile*. Referring to the George Brown copy, we find that the specification, as originally filed in the patent office, used the letters that are, in the 1879 copy, enclosed in brackets, and that these letters were erased while the application was pending, and the letters inserted as they now read in the patent. *But we find more than this*, to wit, *that the drawings of the George Brown copy were so lettered that the original lettering of the specification filed in the patent office exactly corresponded to them*—that is to say, that *when Mr. Pollok's draughtsman made the new drawings for the patent office, in January, 1876, and inadvert-*

ently changed the curves as hereinabove shown, it escaped notice that the lettering of the specification must also be changed to correspond, and so the specification went into the patent office exactly like the George Brown copy, and had to be changed afterward before the patent issued.

38. The first sentence of the "interpolated paragraph," on p. 9, commencing with the words "electrical undulations" in line 28, appears in the 1879 copy inclosed in brackets, showing that, at that time, this sentence either appeared in brackets or as an interlineation. In the photographic *fac simile*, no brackets appear—showing that the record has been altered since 1879. But the patent contains no brackets around this sentence—showing that it was an interlineation made after the specification was filed and before the patent was issued. The patent would, of course, show brackets where the original paper indicated that they were intended by the writer to be actually used, but would not show them where they would only indicate a correction of the original manuscript.

39. And now we come to the most remarkable and *suggestive* of all these changes—*a passage corroborating in the most conclusive manner our theory, that the entire description of the variable-resistance current and apparatus, together with the fourth claim based upon it, was bodily interpolated into the application after it was filed in the patent office!*

On p. 9, lines 15, 16, 17, the 1879 copy reads as follows: "There are many ways of producing undulatory currents of electricity, *but all of them depend* for effect upon the vibrations or motion of bodies capable of inductive action." That is to say, "*all of them*" are *magneto-electric*, and *none of them depend upon varying resistance!* If the specification was originally filed in the patent office *without* the "interpolated matter," *this statement was perfectly consistent;* but if the specification was originally filed *with* the "interpolated matter," *this statement contradicted the rest of the specification in terms,*—for it could not be true that *all* of them depended upon induction or magneto-electric action, but *some* of them depended upon variable resistance. The writer might as well have said that "*all of them*" are *black*, but *some* of them are *white*—that all of them are *horses*, but some of them are *cows*. It is impossible that so gross an absurdity should have escaped the attention of so sharp and critical a man as Mr. Bell. He had *written and re-written the specification a number of times, and finally adopted that mode of expression that seemed to him best to explain his invention and the relation that one part of it bore to another*. (Bell, C. Vol. 2, p. 1620, Ans. 394). He had "tried to express it *in language that should be scientifically accurate and complete*, and to the best of" his "ability" he "did so." (Bell, C. Vol. 2, p. 1677, near bottom of page.) It had been submitted to Pollok between December 1 and 15, 1875, and again from January 10 to 18, 1876, and Pollok's sharp eye had detected no inconsistency in it. (Bell, C. Vol, 1, p. 156, Ans. 115.) Pollok made a "*fair copy*" of it and returned the copy to Bell for the oath, January 18, 1876. (Bell, C. Vol. 1, p. 157, Ans. 119.) Bell had sworn to it on January 20, 1876, and sent it to Pollok, and then had called Pollok to New York and spent with him (and probably Brown and Hubbard) a day in going over it with the utmost care, but "no change whatever was made in it, and Mr. Pollok took it back with him" and filed it just as it was. (C. Exhibits, top of page 1011.) *The specification, when filed in the patent office, was not full of erasures and interlineations*, but was, on the contrary, *the* "*fair copy*" which Pollok had made betwen January 10 and 18, which Bell had sworn to January 20, and in which "*no change whatever was made*" thereafter previous to its filing. Yet this "fair copy," when filed, stated substantially in express terms, that no current except the magneto-electric current could be employed for producing electrical undulations!

But when, on February 14, 1876, or within five days thereafter, Pollok's "underground railway" to the Examiner's room in the patent office, had brought him complete knowledge of Gray's caveat and its contents, *it was instantly revealed to him that this statement was not true*—and that there *was* another current which could produce electrical undulations *without* "the vibrations or motion of *bodies capable of* *inductive action.*" There was instant danger that Gray might apply this new current to multiple telegraphy, and thereby steer entirely around Bell's invention. Mr. Pollok's *clerk* (who wrote the "fair copy" only a month before) was ready at hand, available to substitute, in the same handwriting, a new "fair copy," with a contained description of the variable resistance current, and with a broad claim for producing undulations in it. The Examiner was corrupt, and was already in collusion with Pollok and Bell to rob Gray. It was an easy matter, under such circumstances, to withdraw the specification and substitute another, re-written in whole or in part, to describe and claim Gray's current and its undulations for multiple telegraph purposes. Perhaps they dared not go further and claim Gray's principle as applied to a *telephone;* but, as Gray had not described or claimed it for a *telegraph*, there seemed no especial danger in appropriating it to that extent. More probably, both Bell and Pollok believed that it would not answer for sound-copying, because it could not manifest the back-and-forth movements, corresponding to the movements of the air-waves. At all events, the interpolated description and claim were introduced among the *telegraph* appliances, and the described theory of sound-copying was not changed from that originally filed.

In the hurry and anxiety attending upon the surreptitious introduction of this new subject-matter and claim, (and, perhaps, in the absence of Mr. Bell himself,) it was not at first observed that the new interpolated matter made arrant nonsense of the statement that "there are many ways of producing undulatory currents of electricity, *but all of them depend for effect upon the vibrations or motion of bodies capable of inductive action.*" But when Mr. Bell arrived in Washington, and made the long series of erasures and interlineations hereinabove set forth, his sharp eye at once detected the absurdity of allowing *this* passage to remain, *now that the interpolated passage and claim were there to contradict it.* It was hardly prudent to withdraw, and re-write the specification again; so, probably by a pencil amendment, (often allowed at that time by examiners in mere clerical corrections,) he drew a line through the words "*but all of them depend*," and interlined the word "*dependent*," instead. The specification then merely declared in substance that there were many ways dependent upon induction and many ways not dependent upon induction, and thereby became consistent and sensible. The patent was printed as corrected in pencil; but, in the three years thereafter, through many handlings, the pencil marks were rubbed out, and the original words alone appeared. Hence, in 1879, the original words were copied and certified by the Commissioner.

No theory of *mistake* can be set up as to the copy of April 10, 1879, on this subject; for the words of the copy—the words that then alone remained legible in the original specification—are again found to be *the identical words of the George Brown copy!* They were, therefore, in the original patent office specification; they were obliterated before the patent was printed, and the word "dependent" was substituted; the word "dependent" was in turn rubbed out, and the obliterating mark made to conceal the passage: "*but all of them depend*," was also rubbed out, prior to April 10, 1879, and the original ink-written words again appeared; and, between 1879 and 1885, the record has been changed so as to destroy all its evidences of the real history of the great original fraud. Fortunately, in the Providence that sometimes seems to interfere in the interest of justice, the George Brown copy and the certified copy of 1879 remained to reveal, in their relations to each other, the whole iniquity.

Once more. In the George Brown copy we find two sets of claims, *the first set containing four claims, drawn in language not corresponding* to that of the specification originally filed in the patent office,—*the second set also containing four claims corresponding* almost *verbatim* to the claims *originally filed in the patent office*.

What is the meaning of this? Simply this:—Bell had put the final touches to his claims in the early part of January, 1876. "I *completed* the specification for my American patent early in January" (Bell, C. Exhibits, p. 1010, near bottom of page.) He had, afterwards, to wit, on or about January 25, 1876, met Mr. Brown in New York city, and "handed to" him an old copy of the specification, after cancelling the old claims that had first been written in it and inserting the new and more satisfactory forms of claims. The fact, of itself, indicates that Bell had compared and corrected the paper before handing it to George Brown, so as to put it into its final and best shape.

Now, if we take the certified patent office copy, of April 10, 1879,—leave out the amendments filed formally on February 29, 1876, and reject the changes indicated by its brackets to have been made, by erasure and interlineation while the application was pending in the patent office—we shall have remaining *a document which is, to all intents and purposes, an exact duplicate of the George Brown copy*, as corrected and handed to him on Jan. 25, 1876, after the American specification was sworn to—— but with the added "*interpolated passage and claim*," and *with the statement of an additional "advantage"* (*see p. 7 of the 1879 copy*) as follows: "And that cable dispatches may be transmitted more rapidly than by means of an intermittent current, or by the methods at present in use; for, as it is unnecessary to discharge the cable before a new signal can be made, the lagging of cable signals is prevented"— an advantage which evidently occurred to Mr. Bell or Mr. Pollok while the application was pending, and which was accordingly interpolated when the variable-resistance matter was interpolated. The *descriptive* matter, *statement of invention*, *statement of sound-copying theory*, *claims*, and all (except merely the interpolated matter about the variable resistance, and the reference to the additional advantage in preventing the lagging of cable signals) *will be precisely the same as in the George Brown copy.*

It is, therefore true, as Mr. Bell wrote to Gray on March 2, 1877, (C. Vol. 2, p. 1682,) that a "*copy*" *of the specification* was taken to England by a friend *before it was "filed;"* but it is equally true that the letter was skillfully designed to deceive and mislead Gray, and, by a *suggestio falsi*, to induce him to abandon his claim to priority of invention of the sound-copying variable-resistance current; for neither the "copy" nor the "specification" contained a hint of such a current as Gray's when the application was filed.

In the light of these facts, it is quite conceivable that the interference, between Bell and Gray, was dissolved on February 19, 1876, by some chicanery in the manipulation of the dates. Gray was unconsciously in the power of a corrupt conspiracy of scoundrels, who were ready to practice any fraud to defeat him, and who had full possession of the means, in the patent office, to carry on their work.

In view of the above facts, is there any doubt why Bell made a liquid transmitter immediately after his interview with Wilbur—why the apparatus exactly coincided with that of Gray's caveat--why Bell kept silent about the demonstration of speech-transmission, with it—why Bell's apparatus of April, 1876, exactly coincided with Gray's caveat receiver—and why Bell, in his London lecture, sought to connect the April, 1876, instruments, directly with the July, 1875, instruments, ignoring what had occurred in the meantime?

We have seen that the American specification, as filed Feb. 14, 1876, was exactly like the copy which George Brown took to England on the last week of January, 1876; but that, while in the patent office, it suffered *three* separate amendments, viz., first, when the interpolated invention was stolen from Gray and inserted; second, when the whole was subsequently revised to make it consistent with itself; and third, when the formal amendment of Feb. 29, 1876, was made. These amendments amended it *away from* the words of the George Brown copy.

We have also seen that the George Brown copy was originally written in October, 1875, and was afterwards revised and corrected before it was handed to Mr. Brown at New York, on or about January 25, 1876.

Before revision, the George Brown copy was not *verbatim* the same as the American specification—*after revision*, it was a *verbatim* duplicate.

It follows, therefore, that it was not revised and corrected until the American specification was *completed*. The American specification was not completed till Jan. 1–10, 1876, and was not thereafter changed in any respect till filed. *The George Brown copy, therefore, was not revised and corrected to assume its completed form until as late as Jan. 1–25.*

As to the exact time of the comparing of the two papers together and revising the one by the other, there are but two possible hypotheses—either, first, the specification was *independently* completed between Jan. 1 and 10, and the Brown copy *afterward* compared with it *and corrected to conform to it;* or, secondly, the Brown copy was revised and its phraseology made satisfactory between Jan. 1 and 10 and then the specification was *copied* from it, and sent to Pollok on January 10. *In either case,* the specification and Brown copy were carefully compared with and made to conform to each other, *after January 1, 1876, and before George Brown left for England*. There is no escape from this conclusion; because the Brown copy was revised to make it agree with the *completed* specification, and the latter was not *completed* till Jan. 1–10, 1876, and we have Mr. Bell's word for it that it was never afterward altered till it was filed, and that the amendments of the Brown copy were all made before Brown left for England.

The variable-resistance matter was, therefore, not in the American specification between January 1-10, 1876—if it had been the revision of the George Brown copy, at or after that time, by comparison with the American specification, would have caused it to be inserted in the Brown copy also. It is absolutely incredible that when comparing the two papers together and correcting one by the other, so carefully in mere matters of verbal criticism, not only should the infinitely weightier matter of the entire variable-resistance current and apparatus have been passed over without notice, but statements should have been left unaltered in both papers to the effect that no current except the magneto-electric current could be employed for the purposes of the invention.

Thus the erased and amended record of April 10, 1879 demonstrates absolutely that the application filed by Bell in the patent office on Feb. 14, 1876, was an exact duplicate of the George Brown copy; while the erased and amended George Brown copy, in turn, demonstrates conclusively that the latter was carefully compared with Bell's completed patent office specification, and made to conform thereto even in mere verbal details; and Bell's testimony proves that this must have been done after January 1, and before February 1, 1876. Can there be any doubt as to the exact time and place, when and where it was done? The two papers *were together* in New York on January 25, 1876—the Brown copy to be handed to Brown to take to Europe; the sworn specification to be finally reviewed and criticised by Bell, Pollok and Hubbard for the patent office. *Then* was the exact time when they would be compared and made to conform *verbatim* to each other.

The most astounding part of the fraud, is the attempt to cover it up by again changing the record since 1879. Why was this delayed till so late a date, and why, at that late date, attempted at all? We answer that, *prior to the summer of 1880*, although there was some interference litigation going on, and the Dowd suit had been commenced but settled by compromise, the different interests were, for the most part, only *apparently* in conflict, and were really under the control of the Bell Telephone Co. and the Western Union Telegraph Co., which latter company now claimed to own both Gray's and Edison's inventions. There was no great danger of any damaging exposures in that connection. *But when the real litigation began in dead earnest, in the controversy with the People's Telephone Co. in the summer or early fall of 1880, then there was danger that the patent office fraud might be discovered*, and it clearly became of enormous advantage to Bell to remove all traces of it, if that could be successfully done. *Bona fide* litigations with other defendants followed—the number of hostile observant eyes increased—and the danger became pressing. *Some* hand, moved evidently by an *interest* paramount to all other considerations, possessed both the opportunity and the nerve to undertake the desperate work—*and the record was changed.*

Whatever explanations or disclaimers others may have to make as to their part in the perpetration or subsequent utilization of these frauds, we leave them to make as they may think best; we have no idea that appellee's counsel have had any knowledge of these frauds; *but as for Alexander Graham Bell,* who must have known all about the fraud practiced upon Gray in the surreptitious examination of his pending applications in 1875; who filed three applications in hot haste in consequence of that unlawful knowledge, and in order to reap important advantages from it; who must have been *perfectly* cognizant of the fraud practiced upon Gray and the patent office in February, 1876, and must have participated in it; and who knew *absolutely* that the record, as it appeared in the patent office on October 30, 1885, was a false record, and that the photographic *fac similes* used in his behalf at New Orleans and ready to be used in this case, are false and lying witnesses; *no explanation is possible.*

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PART V.

BELL UNWORTHY OF BELIEF AS A WITNESS.

If anything further were needed to demonstrate the worthlessness of any testimony that Mr. Bell might give or may have given, it will be found abundantly in his own deposition, when his different statements are compared with each other and with known facts.

He is a sharp, intelligent, cautious and acute witness, with a rare faculty for using language to express or conceal the subtlest shades of meaning—and with an *appearance* of honesty which is at once attractive and deceptive. Generally he knows exactly when to be silent, and when to speak out; but, presuming upon his own skill and acuteness in word fencing and evasion, and moved by his enormous greed for the honor and profit of the great invention in controversy, he has, in his testimony, at many points, lost his caution and boldly falsified facts when the proofs of his falsehood were ready at hand. We shall now proceed to point out some of these instances—but we have neither time nor space to enumerate them all.

1. On pp. 1624, 1628, 1629 (C. Vol. 2), he testified as follows:

" *Cross-Q.* 402. When did you first learn that Elisha Gray was before the U. S. Patent Office, with a caveat or application for an electric speaking telephone? *Ans. I do not know.* My impression is that I learned this from the following letters, dated respectively February 21 and March 5, 1877, received from Mr. Elisha Gray.

* * * * * *

" *Cross-Q.* 403. When did you first know that you had *any* competitor in the United States Patent Office for the invention of the speaking telephone? *Ans. I think in March, 1878,* when the telephone interferences were declared. I have already referred to the letters of Mr. Elisha Gray of February 25, and March 5, 1877, in this connection.

* * * * * *

In *Cross-Q.* 404, the caveat interference notice of Feb. 19, 1876, and the consequent proceedings were called to his attention, and he was asked:

"Did not these proceedings relate to your application for the patent of March 7, 1876, and did you not have notice of said letter, signed by Examiner Wilbur, and dated February 19, 1876, at the time or immediately thereafter? *Ans.* These proceedings did relate to my application for the patent of March 7, 1876. My recollection is that the proceedings in relation to the interference were managed entirely by my counsel, Messrs. Pollok and Bailey, without consultation with me, and that I merely knew that some interference had been declared and had been dissolved, without my knowing anything about the details of the proceedings."

From what we *now* know of Mr. Bell's relations to the Gray caveat, the court can, from these answers, readily appreciate the value of Bell's testimony on any point where his interests are an important factor.

2. On p. 1599 (C. Vol. 2) appear the following question and answer:

"*Cross-Q.* 340. Then prior to June 2, 1875, if I understand you, you did not believe that the vibrations caused in the armature of a receiving instrument by electrical undulations occasioned by the vibration of the armature of another instrument in the same circuit as the first, would be of sufficient force to prove practically useful for either of the purposes you have mentioned—that is, the purpose of reproducing articulate speech, or the purposes of multiple telegraphy—whether a permanent magnet were vibrated in front of an electro-magnet without a battery in circuit, or a plate of inductive material were vibrated in front of an electro-magnet with a battery in circuit; am I correct? *Ans.* I was extremely *doubtful;* I *hoped* that they might prove of sufficient force, *but was unable to decide* simply from the state of knowledge at the time, *without practical experiments to test the point.*"

Now, it is not true that he was "doubtful," or that he had any "hopes" whatever in the matter. In his preliminary statement in the *harmonic telegraph interference* (C. Exhibits, pp. 984–986), he states that, during the summer of 1874: "*The thought occurred of inducing the impulses by means of a permanent magnet instead of a battery*" (middle of p. 984);

that he then conceived of the apparatus shown in figures 15, 16, (pp. 994–995); but that (p. 986), "Fearing that ridicule would be attached to the idea of transmitting vocal sounds telephonically, especially by those who were unacquainted with Helmholtz' experiments, I said little or nothing of this plan. *Indeed, reflection convinced me that, however, feasible the scheme looked upon paper, it was impracticable, as the induced currents would be far to feeble to overcome any great resistance. For the same reason the plan shown in Figure 15 seemed impracticable save in theory, and I began to look about for some other method* of inducing alternate, positive and negative impulses, which should succeed each other at equal intervals of time, *and at last I hit upon the plan of making and breaking contract by means of a revolving cylinder*, as shown in Figure 17."

Again, in his preliminary statement in the *Speaking Telephone Interference* (C. Exhibits, p. 1002), Mr. Bell, referring to the same matter, says:

"The question arose in my mind whether an armature might not be set in motion by a membrane similar in shape and structure to that of the human ear, so as to produce a current which should correspond to the vibrations of the air. *I did not, at this time, devise any method of combining a membrane with an armature*, or attempt to construct any apparatus upon the plans I had conceived. I never constructed the instrument which I have described, made up of a number of armatures attached to a permanent magnet and tuned to different pitches, and which I had devised with special reference to multiple telegraphy, *because I thought that the currents which would be induced would be so exceedingly weak, that no useful effect would be produced by them corresponding to what I had theoretically attributed to them. I therefore turned my attention to other modes* of working out my plan of multiple telegraphy, which I was thoroughly bent upon reducing to practice immediately."

In view of these two statements of Mr. Bell, the former sworn to May 8, 1876, and the latter November 20, 1878, explicitly declaring that he regarded both forms of the conceived apparatus as utterly hopeless and impracticable, and "*therefore* turned" his "attention to *other* modes," the declaration in his 340th cross-answer, in March, 1883, that he was only "*doubtful*," and "*hoped that they might prove of sufficient force*," is simply false. He knew perfectly well that he had had no doubts and no hopes, but that he had abandoned the whole thing as impracticable without making even the simplest experiment to solve a doubt or confirm a hope.

3. The second apparatus referred to in the above two extracts from his preliminary statements, was his imaginary "*harp-apparatus*," as will appear by comparing Figure 16 of his Harmonic Telegraph Statement (C. Exhibits, pp. 995, 985–6) with Figure 8 of his testimony (C., Vol. 1, pp. 118 119). On p. 119 (C., Vol. 1), Mr. Bell testified as follows:

> "*Int. 38.* Did you ever build such an apparatus as Fig. 8; and if not, why not? *Ans.* I did not, *because of the great number of reeds that would be required, and because I saw that the instrument could be very much simplified.*"

This is the very instrument about which he had sworn, in his preliminary statements, that he did not build it *because he thought the currents induced by it would be too weak to produce any useful effect*, and that "*therefore*" he turned his attention to *other* modes! What reliance can be placed upon the word of such a witness?

4. In his testimony at the top of page 138 (C. Vol. 1) and the bottom of page 1621 (C. Vol. 2), he alleges that he heard "timbre" during the experiment of June 2, 1875; whereas, in his letter written June 2, 1875 (C. Vol. 1, p. 136), after the experiment was over, he describes with great exultation his recognition of pitch and loudness, *but is totally silent as to the greatest of all results—timbre!* Again, in his letter of July 1, 1875 (C. Vol. 1, p. 143), he speaks as though timbre had not yet been produced, but he was going to make an experiment the next day which he hoped would produce it. That he did not succeed is shown by his superscription on the George Brown sketch, "Exhibit Toronto Drawing," December 28, 1875 (C. Exhibits, sketches preceding page 3). In view of these letters, written at the time, is there the slightest doubt that his subsequent testimony as to hearing timbre on June 2, 1875, was false!

5. Watson's cross-examination in August, 1882, in the People's Telephone case, (see C. Vol. 1, pp. 307–333), had developed very strongly the damaging facts about Bell's experiment on March 10, 1876, with the Gray liquid-transmitter, and that the first speech was transmitted on that occasion, and that the thumb-nail armature magneto-telephones were made after that date, and were the first magneto-telephones to transmit speech.

Prior to this testimony of Watson, Bell had not even *attempted* to claim that he ever got a word of speech electrically until he produced the "thumb-nail" magnetos. In his *London lecture,* (C. Exhibits, p. 900) he had stated (Oct. 31, 1877), with relation to the instruments of July, 1875, and also to the "thumb-nail" instruments of April, 1876, as follows:

"The results, however, were *unsatisfactory* and *discouraging.* My friend, Mr. Thomas A. Watson, who assisted me in this first experiment, declared that he heard *a faint sound* proceed from the telephone at his end of the circuit, *but I was unable to verify his assertion.* After many experiments, *attended by the same only partially successful results,* I determined to reduce the size and weight of the spring as much as possible. *For this purpose, I glued a piece of clock-spring, about the size and shape of my thumb-nail,* firmly to the center of the diaphragm, and had a similar instrument at the other end (Fig. 24); we were *then* enabled to obtain *distinctly audible effects.*" And in his lecture, he illustrates his "unsuccessful and discouraging" (July, 1875,) apparatus, by a *copy of Figure 7 of the drawings of his patent of March 7, 1876,* and his successful (April, 1876) instruments, by a cut of a very different apparatus, similar to that which he gave Sir William Thomson in August, 1876. (See C. Vol. 2, p. 1661.)

Watson, in his testimony in the Doud case, in July, 1879, (C. Vol. 1, p. 203, Ans. 13,) had described the July 1875, experiment with equal explicitness, saying:—

"I shouted into the membrane telephone. Mr. Bell listened at the receiver. I think he heard nothing. We changed places. He shouted at the telephone and I listened at the receiver. I could hear a faint sound."

Bell had written, with his own hand, on the Toronto

Drawing, left with George Brown on December 28, 1875, these words:—

"First attempt to transmit the human voice. The varying pitch of the voice could be discriminated but not the quality. A sort of muttering effect was perceived at the receiving end, when a person talked very loudly at the other end."

Bell himself had testified in the Doud case, in July, 1879, (C. Vol. 1, p. 145, Ans. 90,) giving a highly colored statement of the result, but, admitting that no words could be **heard.**

"I do not remember, with any great distinctness, the details of the experiment, but I have a distinct recollection that during the course of the experiments Mr. Watson rushed up to the room at the top of the building, where I was, and informed me that he could distinctly hear me speaking, although he could not quite make out what I said."

To say that even this is rose-colored, in its exaggeration, is putting the fact mildly, in view of Watson's testimony.—

But when Bell was under cross-examination in the People's Telephone case, in March, 1883, after Watson had let out all the facts about the March10, 1876, experiment, and the true date of the thumb nail instruments, he began to feel the necessity of magnifying the July, 1875, experiments and their results, to the greatest extent that could be done; and he rose royally to the height of the occasion! He said, (C. Vol. 2, p. 1575, Ans. 282):

"I was interrupted by the sudden appearance of Mr. Watson, who had rushed up stairs in a state of great excitement, and who declared that he had heard vocal sounds proceed from the instrument to which he had been listening, *and that he could almost understand what was said.* * * * I have a general recollection that numerous similar experiments were made during June and July, and that I myself obtained audible results. *It is my impression that a few common words and sentences were occasionally understood,* but I can not give the details of any particular experiment in which this was the case. I only remember that the results were such as to lead me to the firm conviction that the speaking-telephone was a *fait accompli.* In consequence of this I took out a patent for the speaking telephone, without waiting to obtain any better results." And see his equally extraordinary answer 281, same volume.

It is clear that these answers were nothing more nor less than perjury. They are contradicted by his London lecture, by his letter of August 14, 1875, to Gardiner G. Hubbard, by his writing on the George Brown Toronto Drawing, by Watson's testimony, and by his own sworn statement in the Telephone Interference (C. Exhibits, p. 1009).

Even his counsel do not believe the yarn, for Mr. Storrow, speaking of these tests of July, 1875 said, "which it is claimed *and probably truthfully*, did not amount to the intelligible transmission of articulate words" (see his New Orleans Argument, p. 36). The man who could so stretch the truth to meet a supposed emergency in his suit, is unworthy of belief on any point where his interests are involved.

6. In his testimony in the People's Telephone case, in the same answer (282, C. Vol. 2, p. 1575), in which he falsifies the story of what was heard in July, 1875, he was obliged to admit that, on the occasion when Watson "rushed up," he himself had been able to hear nothing. He had, in his later cross-examination, set deliberately about the work of misrepresenting the performances and capabilities of those instruments, and he was sagacious enough to know that the question would arise: "Why could *you* not hear anything?" He was therefore ready to anticipate the question with an explanation, as follows:

"This inability I attributed *at the time* to the *noise of the machinery in the workshop*, and to the fact that *Mr. Watson was unable to throw out his voice with sufficient force* to set the membrane of his telephone into good vibration."

Was this the *true* explanation? Not at all. He himself, in his preliminary statement five years before (C. Exhibits, p. 1009), had given the *true* reason:

"I am free to say that the results were not as good as I had expected, *but I believed that the failure to obtain better results was due to the imperfect construction of the instruments or to their parts not being properly proporioned.*"

Here, again, the testimony in his deposition was clear perjury. He swore, as a *fact within his recollection*, like any other fact, that he, *at the time*, attributed the failure to a cause to which he never attributed it. *He had no such thing within his memory when testifying, but made up the excuse as he went along*, without regard to the state of his *memory*. If he had forgotten what he attributed the failure to "at the time," he should have said so; but he had no right to make up a story and swear to it as his memory. Such testimony is exactly what the law defines as perjury. It exhibits a dangerous inherent tendency *to make out a good case* at all hazards, and is of a character to discredit everything that depends upon the uncorroborated word of the witness.

In this instance, the story told by Mr. Bell, in cross-answers 281, 282, is particularly silly. Watson had sworn that he *shouted* at the telephone, but Bell could hear nothing; and that when Bell *shouted*, Watson could hear only a faint sound. Weakness of voice is a puerile suggestion, under such circumstances. The noise of the workshop is equally puerile. Would they not have tried the experiment elsewhere, or in the evening when the workshop was still, if *that* had been believed to be the cause?

PART VI.

THE PATENT OF JANUARY 30, 1877.

But little needs to be said concerning this patent, in view of what has gone before. When this patent was taken out, the magneto-telephone, in the hands of Mr. Bell and his assistants, was a completed invention, having received its latest improvements in October and November, 1876, and no longer remained a thing for "the future" to "discover." He therefore no longer sought to patent a mere *theory* or *current*, "in its present undeveloped state," as in March, 1876, but he addressed himself to the work of describing a *machine* and claiming the details of its construction.

As the only telephone invention which Mr. Bell had ever made (if he made any at all), was a magneto-electric apparatus, this patent, like the former, should be strictly limited to the magneto form of instrument.

But the same old variable resistance fraud turns up again in this patent, to vitiate it and destroy its validity even for what it might otherwise have protected.

With the proofs now before the court, if there is anything clear, it is that Mr. Bell had no legal right to appropriate, in *any* patent, at any time, the variable resistance invention, knowledge of which he had derived from Gray; and that any patent in which such a fraud should appear, must be thereby rendered utterly null and void. The statute provides that where error creeps into some part of a patent by inadvertence, accident or mistake, and without any fraudulent intent to deceive, such innocent error shall not affect the validity of the other parts of the patent; otherwise, it renders the whole patent void.

Now, if Mr. Bell, in January, 1877, attempted to weave the variable-resistance current or apparatus into his new telephone patent, and to make descriptions and claims to cover it, *there was no inadvertence, accident or mistake about the matter;* it was deliberately done to defraud and deceive the public and to cover and appropriate the invention of another, and the whole patent is clearly void.

Yet that is exactly what Mr. Bell did, in January, 1877, in the patent now in question; and he did it with a devilish ingenuity and cunning which at once betray the *motive*, as well as the fact that he fully appreciated the personal danger of *going too far*. The problem before him, as he apparently viewed it, was a difficult one; it was *to describe and claim* Gray's invention, without actually laying himself liable to the pains and penalties of perjury by swearing that it was, in fact, his own invention. His cunning and skill proved equal to the emergency. He actually succeeded in incorporating Gray's invention bodily *into this patent also*, but by indirection and insinuation only. Every statement of the specification as to the Gray form of device is *literally* true, and yet as to such matters, the specification is, in fact, a lie and a fraud, and was clearly a deliberate attempt to deceive the public and the courts, and to appropriate and cover Gray's invention of the variable resistance telephone.

He did it in this way: In his former patent of March 7, 1876, the fifth claim had not been made to include the receiver as a claimed element, but was drawn only to cover the *current*, and was limited to a current of special form, excited by a special magneto-electric apparatus. Taking advantage of this fact, he described the invention of his 1877 patent *as consisting mainly in the receiver*, and, stating that the form of the transmitter was utterly immaterial, he described first *his own* transmitter, and then simply declared that he had "heretofore *described and exhibited*" *other* forms of transmitters to "the American Academy of Arts and Sciences," as would be seen by reference to Volume XII of its proceedings.

The description to which we refer is as follows, italics being our own:

"*The essential feature of the invention* consists in the armature of the *receiving-instrument* being vibrated by the varying attraction of the electro-magnet, so as to vibrate the air in the vicinity thereof in the same manner as the air is vibrated at the other end by the production of the sound. *It is therefore by no means necessary or essential that the transmitting-instrument should be of the same construction as the receiving-instrument.*

"*Any instrument receiving and transmitting the impression of agitated air may be used as the transmitter*, although for convenience, and for reciprocal communication, I *prefer* to use like instruments at either end of an electrical wire. *I have heretofore described and exhibited such other means of transmitting sound*, as will be seen by reference to the proceedings of the American Academy of Arts and Sciences, Vol. XII."

The paper referred to was presented to the Academy, *May 10, 1876*, and the reference here mentioned will be found in C. Exhibits, pp. 75, 76, and is as follows:

"13. Electrical undulations can be produced directly in the voltaic current by vibrating the conducting wire in a liquid of high resistance included in the circuit.

"The stem of a tuning fork was connected with a wire leading to one of the telephones described in the preceding paragraph. While the tuning fork was in vibration, the end of one of the prongs was dipped in water included in the circuit. A sound proceeded from the distant telephone. When two tuning-forks of different pitch were connected together, and simultaneously caused to vibrate in the water, two musical notes (the unisons respectively of those produced by the forks) were emitted simultaneously by the telephone.

A platinum wire attached to a membrane completed a voltaic circuit by dipping into water. Upon speaking to the membrane, articulate sounds proceeded from the telephone in the distant room. The sounds produced by the telephone became louder when dilute sulphuric acid or a saturated solution of salt was substituted for the water. Audible effects were also produced by the vibration of plumbago in mercury, in a solution of bichromate of potash, in salt and water, in dilute sulphuric acid and in pure water." (See. also C. Vol. 2. p. 1658.)

To thus describe an apparatus, *in a patent specification*, by reference to the papers and documents of a remote scientific association, was a novel and unique proceeding, and would not have been done without a reason. When we come to know the history of the alleged invention, and *the peculiar relation of the patentee to the thing thus described*, we can, without difficulty, understand and appreciate the reason. It was simply an attempt, by insinuation and without directly swearing to the variable-resistance transmitter and current as his own invention, to enlarge the specification by construction so as to include the invention of Gray as well as his own; Mr. Pollok's "*clerk*" had borrowed the Gray current and apparatus and interpolated it into the former patent as a multiple telegraph invention. Mr. *Bell* had acquiesced in that fraud, and would now borrow the whole thing for telephone purposes, but, in so prudent and cautious a way as to leave the *court* to construe it into the patent *as a described equivalent*, rather than run the risk of describing and swearing to it as his own invention.

But, the facts now being known, it is clear that the court should, by reason of this fraudulent attempt to qualify the whole meaning and scope of the patent of January 30, 1877, hold the latter entirely void. In no event, it is submitted, can the patent be construed to include anything more than Bell's own invention—the magneto telephone.

The claims of this patent, here sued upon, are the *fifth*, *sixth* and *eighth*. (See Int. 21, C. Vol. 1, p. 40.) These claims are as follows:

5. "The formation, *in an electric telephone, such as herein shown and described*, of a magnet with a coil *upon the end or ends of the magnet nearest the plate*.

6. "The combination, *with an electric telephone, such as described*, of a sounding-box, substantially as herein shown and set forth."

* * * * *

8. "In a system of electric telephony, the combination of a permanent magnet with a plate of iron or steel, or other material capable of inductive action, with coils *upon the end or ends of said magnet nearest the plate*, substantially as set forth."

Reviewing these claims, it may be said at once that the *sixth* is utterly *void, on its face, as not being for an invention*. It is merely the putting of the mechanism *into a box*. No particular form of box is specified, nor does the specification state any function or result as derived from it. It is described merely as "*the cover or sounding box D.*" This description is afterward rendered still more indefinite by the statement: "I have shown the apparatus in one of its simplest forms, it being well understood that the same may be varied in *arrangement, combination, general construction* and *form*, as well as *material of which the several parts are composed*," which "blanket" statement covers the *box* as well as all else described. The identical mechanism out of a box would not infringe this claim; but in any kind of a box would infringe. *Why* it would infringe, does not appear, because it is not stated *why or how* the box acts as a "sounding-box." The prior patent of March 7, 1876, whether valid or invalid, published to the world the vibrating armatures and electro-magnets coupled with *boxes* to concentrate and direct the sound to and from the diaphragms;—does *this* box do anything more or differently? If so, why and how? We submit that the claim is clearly void.

The *fifth* and *eighth* claims are simply for the old *Schellen* form of magnet (See Additional Proofs, p. 448, and also Defendants' Exhibits p. 116*a*), when substituted for the Battery current of the March 7, 1876, patent, *as a means of polarizing the cores of the electro-magnets*, precisely the same purpose for which Schellen and Wheatstone had used the same devices in their telegraph and speed-indicating apparatus, years before. They involved no discovery of Bell's, but merely the use of known equivalents for polarizing electro-magnets. In his 1876 patent, he had polarized the cores by a battery current—here, he used a permanent magnet instead, but both were known equivalents for that purpose long before he entered the field. Bell understood their equivalency in 1873–4 (See Ans. 30–36, C. Vol. 1, pp. 116–118), and deduced the necessary result of the permanent magnet "from the well known laws of magneto-electricity." (Ans. 35, 147, C. Vol. 1, pp. 117, 165, and Ans. 334, C. Vol. 2, pp. 1597–8.)

Besides, the defendants' Tisdel receiver (C. Vol. 1, pp. 83, 84,) does not come within the express limitation of both claims to a permanent magnet, *having the coil upon that end which comes nearest to the diaphragm;* for in the Tisdel receiver, that pole *which terminates "in a thin metallic tongue a,"* is the pole which comes *nearest to the diaphragm,* and the coil is attached *not to that pole,* but to the other pole.

Both this patent and that of March 7, 1876, are completely anticipated by the prior inventions of Daniel Drawbaugh, as shown in our brief on the Drawbaugh case, filed herewith.

PART VII.

SOME GENERAL REMARKS UPON THE PATENTS OF MARCH 7, 1876, AND JANUARY 30, 1877.

So far as the patent of March 7, 1876, refers to an *apparatus* for electrical sound copying, it is, on its face, and in view of appellee's own evidence, almost conclusively invalid for want of that "full, clear and exact description and specification" which the statute calls for.

The *drawings* are not even professedly drawings of any complete *machine*.

Mr. Bell testifies (C. Vol. 2, pp. 1620, 1696,) as follows:

(*P. 1620.*)

"*Figures five and six do not pretend to show the full construction of the apparatus they illustrate, but are simply electrical diagrams.*"

* * * * * * * * *

Cross-Q. 395. "*Is Fig. seven of that patent,* like Figs. five and six, *only an electrical diagram? Ans. Certainly.*"

* * * * * * * * *

(*P. 1696.*)

Cross-Q. 608. Please explain exactly what you mean by the expression, "electrical diagrams," which expression you have used several times in your testimony? *Ans.* A diagram that would illustrate the general electrical arrangements described in the specification, and *that did not profess to be exact drawings of the apparatus, or even to show many of the mechanical details of construction.*"

The *drawings*, therefore, can not be relied upon to exhibit the construction of any completed apparatus.

The *specification* is equally deficient in the information required by the law. Its description of this *apparatus* consists substantially of *four printed lines!*

"The armature *c*, Fig. 7, is fastened loosely by one extremity to the uncovered leg, *d*, of the electro-magnet *b*, and its other extremity is attached to the center of a stretched membrane *a*. A cone, A, is used to converge sound-vibrations upon the membrane."

* * * * * * * * * *

It is the contention of appellees that this description, coupled with the drawing, Fig. 7, and with Mr. Bell's statement, in the specification, of the principle and theoretical mode of operation of the machine, is sufficient to enable any one "skilled in the art" to make the devices and successfully practice the invention. In the same breath, however, they tell us *there was no art*, and hence *no one skilled in the art*. But Mr. Bell's experiments had all been "unsatisfactory and discouraging,'' (London Lecture). He, himself, had been able to get only a "faint, muttering sound," and no "quality," hence no articulation (Toronto Drawing). It was for "the future" to "discover" the art (Letter of Aug. 14, 1875, to Gardiner G. Hubbard). *Bell*, certainly understood his theory or "principle," but he could not make his apparatus operate. His assistant, Watson, also understood it, and was "skilled in the art" in electrical matters, and *he* could not make the apparatus operate. They made "*many experiments, attended by the same only partially successful results*" (London Lecture), and it was not till April, 1876,—a month after the patent issued —that they discovered *how to change the construction* of the apparatus so as to make it work. The patent gives us no hint of what this change should be. Before the change, the apparatus would *not* operate; after the change, it *would*. The difference is the difference between an inoperative and an operative device, and this difference is exactly what the law requires to be clearly pointed out in the patent; but the patent is silent as to what it is, *because Mr. Bell did not himself know, and had not been able to find out, when the patent issued*. See *Appendix* following this brief.

What the appellees ask the court to do, is to construe the invention of April, 1876, into the prior patent *nunc pro tunc*, because, foresooth, Mr. Bell they say *afterwards* discovered how to make the apparatus operative by changing its construction ! There is not, it is believed, a decided case to be found where, under such circumstances, a patent has ever been sustained. The law requires certainty, not conjecture; accomplishment, not speculation, theory *and experimental failure.*

There can be no doubt, now, that Mr. Bell had, before his patent issued, a full and thorough knowledge of all there was in Gray's caveat. If he did not personally examine it, Mr. Pollok or Mr. Pollok's "clerk" *did;* and what they knew, Bell knew, and made use of his knowledge. The changes which he made in his April, 1876, instruments were simply the substitution of the details of mechanical construction of Gray's caveat *receiver* in place of the details of construction of his own July, 1875, instruments. The very first pair of magneto instruments which Bell ever made after knowledge of the caveat, were mere copies of the caveat receiver. How long would it have taken Mr. Bell to produce *a speaking telephone* if he had *not* had knowledge of Gray's caveat receiver! Who can answer this question? Would the world *ever* have had a "Bell telephone?" In law, is not Mr. Bell chargeable with the results of his fraudulent knowledge of Gray's apparatus, by a *legal presumption* against the originality of the changes which he introduced into his apparatus in April, 1876? If so, *who is in law, the inventor of that completed and operative apparatus of April, 1876,* Bell or Gray, or Bell and Gray jointly? Can the 1877 patent be held valid, in view of the facts which we now know concerning the genesis of this apparatus? *Does not the great monumental fraud run through the whole, from the beginning to the end of both patents, poisoning and invalidating all!* What can the court point to, of completed invention in either patent, and say that it is not tainted with the primal fraud and, possibly if not probably, the direct or indirect consequence thereof! *Contra spoliatorem omnia præsumuntur.*

It is no answer to all this to say, as the appellee's counsel do, that Gray has *acquiesced* in Bell's claim of priority of invention. Gray was deceived and misled by the falsehoods and frauds practiced upon him, and he is no more bound by his acquiescence thus procured, than he would be by a deed procured from him by fraud and falsehood. The charge that he stood by and saw Mr. Bell exhibit the liquid transmitter at the Centennial, without making any claim to the invention, is unquestionably a falsehood. It is, in substance, negatived by even the testimony of Bell, who swears (C. Vol. 1, pp. 159, 160, Ans. 133–135) that, although he had the liquid transmitters at the Centennial, he exhibited to the judges on Sunday, June 25, 1876, the operation of only the magneto instruments. (See Ans. 134, p. 160.) Thomas A. Watson, who swears so glibly (C. Vol. 1, p. 232), to seeing the liquid transmitter on exhibition at the Centennial, was not even present at the exhibition *of June 25th.* (See Bell, Ans. 135, C. Vol. 1, p. 160.) William H. Hubbard, who swears in the Dowd case (original Dowd record, p. 558, Ans. 8) that Bell showed and explained it to the judges on June 25th, is contradicted by Gray in the same case (same record, p. 126, Ans. 53), and more emphatically by Prof. Barker (*additional proofs*, pp. 6–11, 29–32), who made the arrangements for the exhibit, explained some of the instruments to the audience, virtually superintended the exhibition on behalf of Mr. Bell, and saw no liquid transmitter there, but testifies that Gray, on that occasion, explained to him *his* liquid transmitter. But even if Gray *had* seen Bell's alleged liquid transmitter there, the deception that was all along practiced upon him in regard to Bell's date of invention, and the mistaken confidence that he then reposed in Bell's assertions about it, would fully account for his acquiescence, of which so much is now attempted to be made by way of estoppel. Gray was, undoubtedly, lulled into inaction, but he was lulled into it by the fraudulent interpolations that had been introduced into Bell's application on its way through the patent office, and by the fraudulent representations that were made about it by Bell and his associates after the patent issued, as well as by a letter which *Wilbur* wrote him eulogizing Bell's *discoveries.* We are not of counsel for Gray, and have no interest in the fate of his invention, except to see, on behalf of our clients, the People's and Overland Companies, that the court understands the facts, and that it shall not be deceived by the frauds and false pretensions, which have for years successfully eluded detection, and deceived and misled not only Gray himself, but even the courts below.

In the foregoing brief, we have discussed the validity and scope of the Bell patents of March 7, 1876, and January 30, 1877, *in view of the matters shown in the appellee's own record*, and without reference to the clear and overwhelming evidence of the complete anticipation of both of them by the prior invention of Daniel Drawbaugh, which is discussed in separate briefs herewith filed.

This suit is brought in a court of equity, where the complaining party must come with clean hands. But here, *as shown by its own proofs*, introduced to bolster up its case, the complaining party comes with false and fraudulent title deeds, whose pretended honesty it has attempted to establish *by robbery and forgery committed upon the public records*. Its whole case is poisoned and rotten with corruption and iniquity. And yet, upon this rottenness and corruption, it is to-day maintaining a great monopoly, oppressing and robbing the public, and holding these appellants and other innocent parties enjoined from the enjoyment of their legal rights and the prosecution of their lawful business.

It is time that this wrong should be summarily stopped; and that the penitentiary should open its doors to receive the perpetrators of it.

LYSANDER HILL,

Of counsel for the Peoples and Overland Telephone Companies

APPENDIX.

As Bell had his instruments in 1875, and showed them in his patent of March 7, 1876, they were radically wrong in construction.

1. The armatures were too heavy. In the "reproduced" instruments tested by appellees in this suit (for cuts of them see C. R. Vol. 2, pp. 1709, 1710, 1714, 1715, 1718, 1720, 1721), the armatures were apparently made as thin as a watch spring—mere *lines*, as shown in some of the cuts. No appreciable inertia or momentum is possible in such armatures. Compare them, for a moment, with the heavy armatures of the original Bell instruments of 1875, as shown on p. 1012, of C. Exhibits, and see how the original instruments were departed from, in this particular, for the purpose of making the "reproductions" work in the so-called tests!

2. In the original instruments the armatures were arranged at an angle with the pole of the electro-magnet, in which position they would lose a portion of the attractive or inductive force. Compare again, and see how carefully the appellees' counsel and experts improved their "reproduced" instruments to remedy this defect, before submitting them to a test!

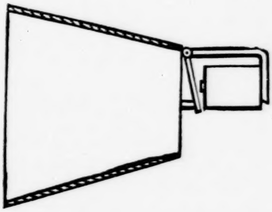
3. In the original instruments the pole of the electro-magnet pointed to the armature at a spot between the center and edge of the membrane, so that the attractive or inductive force was not exerted at the free end of the lever or armature, but intermediate between the ends. In the transmitter (which exerts the *inductive* force), this point on the armature would, in such case, have a *less range of movement* than the end, and hence the inductive force would be proportionately reduced, and a feebler current would pass over the line. This feebler current, arriving at the receiver (where it acts by *attractive* force), would, in turn, be exerted upon the armature there, not at the end of the lever where its leverage would be greatest, but intermediate between the

ends, *where the leverage would be against it;* and hence another portion of the force would be lost. With the force thus thrown away, a *heavy* armature would not obey the electric impulses, but would have a strong tendency to vibrate after a law of its own.

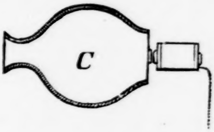
In "reproducing" instruments for tests, the appellees were careful (see C. Vol. 2, pp. 1715, 1718) to arrange the pole exactly opposite to the end of the armature, in the instruments where the heaviest armatures appear, from the cuts, to have been employed; but, in the other reproductions (see pp. 1709, 1710, 1714, 1720, 1721), where they arranged the pole to act between the ends of the armature (as Bell did in 1875), they have reduced the thickness of the armatures to a mere line. There was *method* in this. Very slight differences in these instruments affect the result. The reproduced instruments *talk;* the originals could not.

4. In nearly all the "reproduced" instruments, the hinges were knife-edge hinges, such as are used in delicate scales for apothecaries' and chemists' purposes—no friction, no resistance. How different from the crude structure shown in C. exhibits, p. 1012!

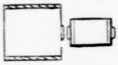
In Fig. 7, of the patent of March 7, 1876, all these defects appear. See cut below:



In Gray's caveat receiver, none of them appear. See cut below:



In Bell's improved (and *talking*) device of April, 1876, none of them appear, but Gray's construction is closely copied, as will at once be seen from the following cut of Bell's, April, 1876, device:



In appellees' so called "reproduction" tested in this case, the *form* of the patent device and the July, 1875, device is *apparently* retained, *but the substantial defects which render those devices worthless and impracticable*, and which Mr. Bell did not perceive nor know till after his knowledge of Gray's caveat, and after the date of his patent, *have been carefully and skillfully removed by somebody familiar with the present knowledge of speaking telephone constructions.* It is, therefore, evident that the appellees' tests prove nothing as to the alleged operativeness of Bell's 1875 instruments, or instruments made according to Fig. 7, of his patent, but only that a person familiar with the *present* knowledge of telephones can *now* take the old devices, and *by suitably altering them*, make them do what Bell and Watson could *not* make them do.

In his New Orleans argument, referring to the Reis transmitter, *Mr. Dickerson* (of appellees' counsel) said (p. 105): "You can, perhaps, make that send a Bell current *by slight alterations in it.*" Again (p. 108): "The question is how the two things *operate*, not how they *look*."

In the same case *Mr. Storrow* (see his printed argument, p. 91) said:

"A slight change in the *proportions* of such an apparatus may change the character of the operation, and consequently the result; *and the knowledge that one operation ought to be performed and the other avoided, will, with some instruments, enable the operator, without difficulty, to make the change.* But somebody must have the genius to discover what ought to be done.

"If an instrument exists which is intended and adapted to interrupt the circuit at each vibration, and is furnished to the community with a description and directions to make it interrupt the circuit at each vibration, the community, from that instrument and that description will not learn how to transmit speech. If another man comes and instructs the community that, by causing that instrument to perform a different kind of operation a new result, to wit the *transmission of speech*, can be accomplished; *then no matter how minute the change in the instrument might be, nor even though it only requires a new and different way of using it he will have made a great invention;* for, whoever first gives to the community the information which enables it to transmit speech by electricity has, in the language of the constitution, "promoted the useful arts," and his work and importance to the community is not anticipated by the fact that the machinery for transmitting speech, was within easy reach, *if anybody had only known how to do it.*"

Citing and quoting from several decisions of this court to sustain his legal position as here expressed.

But here lies the trouble with Bell: On February 14 1876, *he did not know how to do it*—he had a *theory*, but could devise no instruments capable of verifying his theory. But, having had knowledge of Gray's receivers, and changed his instruments in April, 1876, to correspond to them, and tested *those* instruments, he *now* had both a theory and an *apparatus* capable of doing the work, *and he now knew how to do it.* The court can not, however, construe this knowledge back into his previous patent, *nunc pro tunc.*

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IN THE

Supreme Court of the United States.

OCTOBER TERM, A. D. 1886.

THE PEOPLE'S TELEPHONE COMPANY ET AL.,
Appellants,
vs.
THE AMERICAN BELL TELEPHONE COMPANY ET AL.,
Appellees.

THE OVERLAND TELEPHONE COMPANY ET AL.,
Appellants,
vs.
THE AMERICAN BELL TELEPHONE COMPANY ET AL.,
Appellees.

Appellants' Supplemental Brief on Bell's 1876 Patent.

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SAME,
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Appellants' Supplemental Brief on Bell's 1876 Patent.

It has fallen to our lot to write a history of the development of Mr. Bell's invention of the Speaking Telephone from the materials contained in the complainant's record. It is our purpose to assemble in one paper all the important testimony relating to this subject, now distributed throughout the bulky volumes of the record. This testimony will be accompanied with annotations in elucidation of the text.*

We shall search after the facts, and, where these are in controversy, it is our aim to arrive, as far as possible, at definite conclusions.

We shall rest content, if our work shall prove to be of even the slightest aid to the court in the consideration of the great questions involved in this case.

NOTE —The appellee's four volumes of proofs will be cited in this brief as C., Vol. 1, C., Vol. 2, C., Vol. 3, C., Exhibits, or Vol. 4—C. meaning complainants below.

The appellant's six volumes will be cited as D., Vol. 1, D., Vol. 2, D. S-reb., D. S-rej., D. Exhibits, and D. Add. Proofs—D. meaning defendants below.

I.

It appears from the statements of Mr. Bell, (C. Vol. I, p. 106; Bell's London Lecture, C. IV Exhibits, p. 879; Bell's Preliminary Statement in the Speaking Telephone Interferences, Id. p. 997,) that at an early period, through the enjoyment of exceptional opportunities, he acquired a thorough knowledge of vocal physiology, of the fundamental principles of articulation and of the characteristics and relative qualities of sound.

"My father was a teacher of articulation, and as he intended me to follow his own profession he very early gave me instruction in the anatomy of the vocal organs, the functions of the various organs of speech, and in subjects bearing generally upon the science of vocal physiology."

In the midst of a research conducted by him in the effort "to determine the characteristic tones of the vowels," he became acquainted, through Mr. A. J. Ellis, of London, with the valuable researches, experiments and discoveries of Helmholtz.

"He (Helmholtz) had succeeded in producing, artificially, certain of the vowel sounds by causing tuning forks of different pitch to vibrate simultaneously by means of an electric current. Mr. Ellis was kind enough to grant me an interview for the purpose of explaining the apparatus employed by Helmholtz in producing these extraordinary effects, and I spent the greater part of a delightful day with him in investigating the subject. At that time, however, I was too slightly acquainted with the laws of electricity to fully understand the explanations given, but the interview had the effect of arousing my interest in the subjects of sound and electricity, and I did not rest until I had obtained possession of a copy of Helmholtz' great work, and had attempted, in a crude and imperfect manner, it is true, to reproduce his results."

"The explanations which were given me of Helmholtz' experiment so interested me that I devoted myself to the study of electricity, my special object being to acquire a sufficient knowledge of the subject to enable me to understand Helmholtz' experiments."

"I felt that it was my duty as a student of speech to master all the researches of others that bore upon what was to be my professional study, and I therefore desired to witness the results obtained by Helmholtz, and investigate speech for myself in the manner shown by him."

"Immediately after the conversation with Mr. Ellis in 1867, I formed the resolution of reproducing Helmholtz' synthetical experiments, and finding that my knowledge of electricity was insufficient to enable me fully to understand his arrangement, I took up seriously the study of electricity. In the city of Bath, England, I made electrical experiments with a friend, and attempted to set a tuning fork in vibration by an electro-magnet. I do not remember the date of my visit to Bath, but I think it was in the year 1868; but it might have been earlier. From the year 1867 to 1870, I made numerous electrical inventions based upon Helmholtz' vowel apparatus, and before I left England, in 1870, I had made up my mind to pursue one of these inventions to a practical end. The invention to which I allude is now known as harmonic telegraphy or multiple telegraphy."

In this period of three years, within which he took up seriously the study of electricity, devoting more or less time to electrical experiments, and as results of his research, study and experiment, making numerous electrical inventions, he must have arrived at a clear comprehension of the principles and mode of operation of Helmholtz' apparatus, and of the important discoveries therein illustrated.

"The synthesis of vowel sounds made by Helmholtz was performed by means of an apparatus consisting of a series of tuning forks of different pitches, all of which were kept in vibration by an electro-magnet placed near their prongs, and through the coils of which intermittent currents were passed by a circuit-breaker, so that each tuning fork produced its own tone; and then, by means of resonators, which could be brought into action at pleasure, Helmholtz intensified these partial tones, more or less, or left some of them inaudible at the distance at which the hearer was placed, and thereby produced the quality of sound of whichever vowel he pleased."

Mr. Bell details at length the process of reasoning, through which he was led to the conception of his system of multiple telegraphy.

"While reflecting upon the possibilities of the production of sound by electrical means, it struck me that the principle of vibrating a tuning-fork by the intermittent attraction of an electro-magnet might be applied to the electrical production of music. I imagined to myself a series of tuning forks of different pitches, arranged to vibrate automatically in the manner shown by Helmholtz, each fork interrupting at every vibration, a voltaic current, and the thought occurred: 'Why should not the depression of a key like that of a piano direct the interrupted current from any one of these forks, through a telegraph wire, to a series of electro-magnets operating the strings of a piano or other musical instrument, in which case a person might play the tuning-fork piano in one place and the music be audible from the electro-magnetic piano in a distant city?' The more I reflected upon this arrangement the more feasible did it seem to me; indeed, I saw no reason why the depression of a number of keys at the tuning-fork end of the circuit should not be followed by the audible production of a full chord from the piano in the distant city, each tuning-fork affecting, at the receiving end, that string of the piano with which it was in unison. At this time, the interest which I felt in electricity led me to study the various systems of telegraphy in use in this country (England) and in America. I was much struck with the simplicity of the Morse alphabet, and with the fact that it could be read by sound. Instead of having the dots and dashes recorded upon paper, the operators were in the habit of observing the duration of the click of the instruments, and in this way were enabled to distinguish by ear the various signals. It struck me that in a similar manner the duration of a musical note might be made to represent the dot or dash of the telegraph code, so that a person might operate one of the keys of the tuning-fork piano referred to above, and the duration of the sound proceeding from the corresponding string of the distant piano be observed by an operator stationed there. It seemed to me that in this way a number of distinct telegraph messages might be sent simultaneously from the tuning fork piano to the other end of the circuit, by operators each manipulating a different key of the instrument. These messages would be read by the operators stationed at the distant piano, each receiving operator listening for signals of a certain definite pitch, and ignoring all others. In this way could be accomplished the simultaneous transmission of a number of telegraphic messages along a single wire, the number being limited only by the delicacy of the listener's ear.

The idea of increasing the carrying power of a telegraph wire in this way took complete possession of my mind, and it was this practical end that I had in view when I commenced my researches in Electric Telephony." (C. Vol. IV Exhibits, p. 881.)

The invention, combination and arrangement of the instrumentalities actually necessary to overcome the inherent difficulties remained yet to be accomplished. Success in this effort meant both fame and fortune for Mr. Bell. The commercial value of such an invention was capable of instant appreciation, and as stated by complainant's counsel in his brief in the court below,—"That was before the Quadruplex system came into use, and an instrument of that sort would have been of enormous value."

We can well understand and appreciate how, under such circumstances, the idea "took complete possession" of Mr. Bell's mind, and that in consequence, as stated by him (C. Vol. IV Exhibits, p. 886): "For several years my attention was almost exclusively directed to the production of an instrument for making and breaking a voltaic circuit with extreme rapidity, to take the place of the transmitting tuning-fork used in Helmholtz' researches."

And C. Vol. I, p. 109, "Int. 13. While you were in Canada and Boston, say up to the year 1873 or 1874, how much attention did you pay to the subject of electricity, and what particular use of electricity did you study and experiment upon?" A. "From the moment of my arrival in Canada, in 1870, up to the commencement of 1874, my mind was full of the scheme for the multiple transmission of telegraphic messages by means of musical tones to which I have already alluded. Up to October, 1872, I resided at my father's house in Canada, paying only occasional visits to the United States, each visit continuing for about two months. I had few facilities for experiment in Canada during that time, and none in the United States. I occupied myself chiefly, during my leisure time, in studying the subjects of electricity and sound, and in developing theoretically the practical details of my system of harmonic telegraphy. I also made such experiments as I could with the limited facilities at my command, at my father's house in Canada. From October, 1872, up to the commencement of 1874, I devoted all my spare time to practical experiments relating to the production of sounds by electrical means, with the object of reducing to practice the system of harmonic telegraphy. My daytime was completely occupied with professional work, and I carried on my electrical experiments chiefly at night."

Again, C. Vol. IV Exhibits p. 998. "After arriving in Canada, I pursued my electrical and acoustical studies, and made such experiments relating to multiple telegraphy as I had the means of making at my father's residence. I had good facilities for study, but very insufficient means for experiments. In October, 1872, I removed to Boston with the intention of making the United States my permanent residence. My professional occupation at this time was giving instruction in articulation to deaf-mutes, and lecturing upon the mechanism and nature of speech to teachers of the deaf and dumb who came to me from different parts of the world. My spare time I devoted to electrical studies and experiments with a view to perfecting multiple telegraphy.

In developing my plan of multiple telegraphy certain difficulties made their appearance, and I devoted myself during a summer vacation spent in Canada, in 1874, to devising means to overcome these difficulties, and also to devising new methods of studying sound optically, as aids in teaching articulation to the deaf."

We next note that before he left England, Mr. Bell formed the intelligent opinion and the belief that it was within the range of possibility that an apparatus might be constructed by which the elements of speech might be reproduced at a distance.

This was a rational opinion as to a possibility in general, as distinct from what would previously have been regarded as an absurdity, like one of Jules Verne's conceptions of a journey to the moon. But, on the other hand, he then neither formed any conception of the means requisite, nor entertained any thought of applying himself personally to the solution of the problem.

"From the moment that I became aware that Helmholtz had been able to produce vowel sounds with the aid of electricity, I believed that the other elements of speech might also be produced in a similar manner. I did not, while in England, form any idea of the details of an apparatus for producing speech in this way, but I did very distinctly have the belief that it was possible to construct such an apparatus. I am sure that I stated to friends in England, before 1870, my belief that we should one day speak by telegraph, but I had no idea that I would ever myself be connected with the realization of such a plan."

We have now in complete form, so far as it appears in the record, the history of Mr. Bell's work of invention in England and in Canada, and up to the time of his removal to Boston, in October, 1872.

From this point we shall be enabled to trace very clearly, from the materials afforded in the record, step by step, the progress made by Mr. Bell in his chosen work.

His progress toward the practical development of a system of multiple telegraphy, to which, at this time, he immediately devoted himself, is more clearly apprehended by observing the three definite and distinct stages which constituted the order of this development. In all three stages, sound was produced in the receiver by the rapid vibration of an armature in front of the pole or poles of an electro-magnet, but the apparatus employed was quite different in the successive stages.

II.

THE FIRST STAGE.

During the first stage, his apparatus was clearly modeled upon that of Helmholtz, the necessary variations in the magnetism of the electro-magnet being produced by the employment of a "vibrating circuit-breaker," which occasioned rapid "intermissions" in the electric current passing through the coils of the electro-magnet.

We find the details relating to this stage of the work given more specifically in Mr. Bell's preliminary statement in Harmonic interferences. (C. Vol. IV Exhibits p. 977.)]

"The experiments undertaken in Boston during the winter of 1872–3 related more particularly to the mechanical means of transmitting vibrations. I was acquainted with Helmholtz apparatus for the artificial production of vowel sounds; and all my earlier experiments were modeled upon his. Figures 1 and 2 illustrate the first form of apparatus constructed in West Newton street."

For the figures see C. Vol. IV Exhibits, p. 992–3.

"On account of the small size of the tuning-forks, and the imperfect means at my command, the vibrations obtained were not as satisfactory as had been hoped. The oxidization of the mercury too was a source of great annoyance, and was only partially obviated by covering it with alcohol. The instruments were taken to pieces and put together again without any better result, until I copied more closely the form of Helmholtz' instrument, by constructing the apparatus shown in Fig. 3.

"The instruments shown in Fig. 3 were constructed either in January or October, 1873, but at which period I am unable to state positively."

"In October, 1873, I resumed the practice of my profession in Boston (relinquished, through illness, the preceding July), residing at No. 292 Essex street, Salem, where the experiments with tuning-forks (arranged in Fig. 3) were resumed. In the same month (October, 1873) the attempt was made to substitute a free reed for the transmitting fork shown in Fig. 3. The free reed (R,) Fig. 4, formed the base of a hollow cone of gutta percha (gg); and it was set in vibration by blowing through the orifice O. A platinum wire P, attached to the reed R, dipped into mercury M. The original instrument is still in my possession. Somewhere about November, 1873, an article entitled, 'The Acoustic Telegraph,' published in 'The Wonders of Electricity,' led me to substitute steel plates for tuning-forks in my telegraphic experiments. Two transmitting instruments and two receiving instruments (specimens of which are still in my possession in their original form), were made like those shown in Fig. 5. These were arranged on circuit, as shown in Fig. 6. On pressing K^1, R^1 was set in strong vibration, while R^2 was unaffected save by a slight tremor, perceptible only to the sense of touch. On pressing K^2, neither of the receiving instruments R^1, R^2, responded save by the trembling alluded to above. On pressing K^1 and K^2 simultaneously, R^1 was thrown into strong vibration, but R^2 was not affected. Having no means of tuning the plate, I was unable to make R^2 respond to the vibration of T^2.

"Fig. 7 shows another form of instrument constructed during November, 1873.

"The instrument shown in Fig 8 was also made about the same time, consisting of an ordinary bassoon reed. A wire W was brought to the point P of the tongue, t, and fastened so that the vibrations of t caused P to strike against the metal surface M, thus causing an intermittent current to pass through the electro magnet f.

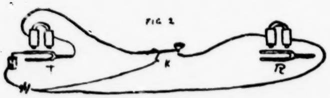
"It became evident to me, that with my own rude workmanship, and with the limited time and means at my disposal, I could not hope to construct any better models. I therefore, from this time, (November, 1873,) devoted less time to practical experiment than to the theoretical development of the details of the invention.

"The arrangement on circuit, at which I had then arrived, is shown in Fig. 9. There was one defect in the plan for which I sought a remedy. Communications could be sent in only one direction.

"While station A was sending to N any intermediate station could also send a message to N, or to any place between itself and N; but it could not communicate with A, or with any place in the direction of A, except by using another line.

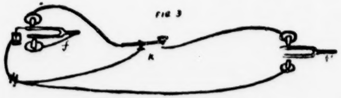
"I saw that one wire would suffice for commuications

FIG 2



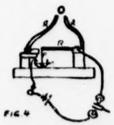
(WINTER OF 1872)

FIG 3



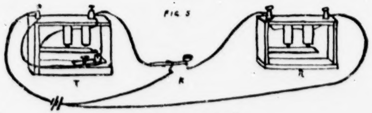
(SPRING OR AUTUMN 1873)

FIG 4



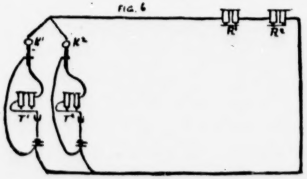
(OCT. 1873)

FIG 5



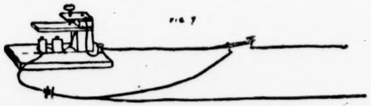
(NOV. 1873)

FIG. 6


K¹
K²
R¹
R²
T¹
T²

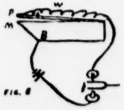
(NOV 1873)

FIG 7



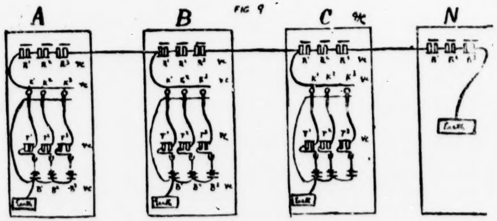
(WINTER OF 1873)

FIG. 8



(WINTER OF 1873)

FIG 9



(NOV. 1873.)

(NOV. OR DEC. 1873.)

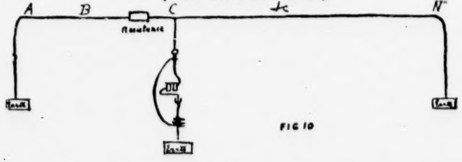

A
B
Resistance
C
N
Earth

FIG 10

simultaneously in both directions if free earth communication could be secured at each end of the line.

"My first attempt to solve the problem was by the application of artificial resistance, as shown in Fig. 10. When the line was put to earth at the two extremities of the circuit A and N, any intermediate station (C) could cause half the intermittent current from its battery to pass to the earth at A, and the other half to the earth at N, by putting sufficient resistance on the shorter circuit

"Study of the arrangement, however, convinced me that the problem could not be solved by any arrangement of artificial resistances; and I was for a time at a loss how to overcome the difficulty."

It thus appears that the apparatus first made and represented by the Figs. 1, 2 and 3, was modeled more or less closely upon the working details of Helmholtz' apparatus (illustrated C. Vol. IV Exhibits, p. 895); that in October, 1873, an attempt was made to substitute a free reed for the transmitting tuning-fork used by himself and by Helmholtz, and that in November, 1873, he substituted steel plates for these tuning-forks, and also at the same time combined upon the same circuit two transmitters and two receivers, arranged as shown in Fig. 6.

It appears, however, that the practical results obtained from this apparatus were very unsatisfactory. One receiver would respond to its transmitter but the other would not. "On pressing K^1 and K^2 simultaneously, R^1 was thrown into strong vibration but R^2 was not affected. *Having no means of tuning the plate I was unable to make R^2 respond to the vibrations of T^2.*"

He then mentions the instruments shown in Figs. 7 and 8, and says: "It became evident to me that with my own rude workmanship and with the limited time and means at my disposal I could not hope to construct any better models. I therefore from this time (November, 1873), devoted less time to practical experiment than to *the theoretical developement* of the details of the invention."

This preliminary statement was sworn to by Mr. Bell, May 8, 1876. Three years later (July 8, 1879) Mr. Bell testified regarding the same period (November, 1873) as follows (C. Vol. I, p. 109):

"Int. 14. I call your attention to Figs. 1 and 2 in the drawing now shown you; When did you construct and use the apparatus therein shown? Ans. In November, 1873.

"Int. 15. Where? Ans. In Salem, Mass.

"Int. 16. Have you one of the originals of the apparatus there shown; if so, please produce it and state which of those figures it is like? Ans. I have, and I now produce it. It is a portion of a transmitting instrument like that shown at T, Fig. 1. All the parts are there except the mercury cup and wire to dip into it; one screw cup and a connecting wire also missing.

"Int. 17. When and upon what occasion were Figs. 1 and 2, or the figures of which these are lithographic reproductions, drawn by you? Ans. They were drawn by me some time before the 27th of April, 1876, as part of the illustrations of my preliminary statement in an interference at the patent office upon harmonic telegraphy.

"Int. 18. State whether you used at that time, in 1873, similar reeds and electro-magnets as receivers, attaching the reed directly to the base or a standard coming from the base instead of using the large box shown in these figures? Ans. I did, in November, 1873. The receiving instrument usually employed by me at that time consisted of an arrangement almost identical with the instrument now shown. This very instrument was frequently used by me at that time as a receiver, by untwisting the wires which connect the electro-magnet with the steel plate armature and passing the intermittent current from one of the interrupters through the coils of the electro-magnet, without passing through the plate.

"During the month of November, 1873, I varied the shape and size of the frame holding the receiver so as more conveniently to get at the plate in order to tune it to its proper transmitter.

"One of my favorite forms of receivers consisted of an arrangement substantially like the model shown, turned upside down, with the bottom of the box (then forming the top) removed, so that the reed was attached to a standard coming from the base. I found this form especially advantageous, as I could remove the plate and substitute others of different length and thickness.

"I now make a drawing of my favorite form of receiving instrument in November, 1873. Figure 3."

(Figs. 1 and 2, referred to, are exact reproductions of Figs. 5 and 6 attached to said preliminary statement, while Figure 3 represents a receiver evidently remodeled from the receiver shown in Fig. 1, as stated.)

"Int. 19. If you ever heard, from a single one of those receivers, tones of different pitches transmitted by transmitters of different pitch, please state when you first did so, describe what you heard, and the circumstances under which you heard it.

"Ans. In November, 1873, I arranged two current-interrupters and two harmonic receivers upon a single circuit, as shown in Fig. 2. The details of the instruments will be understood from Fig. 1. The plate armature of the receiver R^1 was intended to have the same normal rate of vibration as that of the interrupter T^1, and the plate armature of R^2 was intended to have the same rate as that of T^2. It was expected that upon depressing the key K^1, the intermittent current from the interrupter T^1 would traverse the circuit in which the receivers R^1 and R^2 were placed, and cause the reed of R^1 to be thrown violently into vibration, so as to produce its musical tone, and that the reed of R^2 would not respond in the same manner. It was also anticipated that upon depressing the key K^2, the reed of R^2 would be thrown violently into vibration, but that, that of R^1 would not; and that upon depressing both keys K^1 and K^2 simultaneously the reeds of both receiving instruments R^1 and R^2 would be thrown violently into vibration, producing musical tones at the receiving station of similar pitch to the tones produced at the transmitting station by the vibration of the interrupters T^1 and T^2. Upon making the experiment, the results were as follows: Upon depressing K^1, the reed of R^1 was thrown violently into vibration, as had been anticipated, producing a musical tone similar in pitch to that produced by T^1, and R^2 was not sensiblyaffected save for a slight trembling, which was perceptible to the sense of touch. Upon depressing the key K^2, neither of the reeds R^1 and R^2 was thrown into violent vibration, but both were affected by a slight trembling, which could be felt with the finger. Upon depressing K^1 and K^2 simultaneously, the reed R^1 was thrown into violent vibration, but that of R^2 was not. The results were in accordance with the theory upon which my system of harmonic telegraphy was based, only upon the supposition that the reed of R^2 was not in unison with that of T^2.

"Upon placing my teeth against the frame to which the reed R^2 was attached, and plucking the reed with my finger, I clearly perceived that its pitch was different from that of its proper transmitter, T^2. I tried many experiments to tune the reed of R^2, and in the course of these experiments I remodeled the receiving instrument R^2, as shown in Fig. 3, and shifted the position of the reed upon its support, so as to make its free portion longer or shorter, in the attempt to cause its normal rate of vibration to correspond to that of its proper transmitter. I also made the free portion of the reed purposely too short, so that it should have a higher rate of vibration than that of its proper transmitter, and sought to lower its tone by weighting it with lumps of wax. During the course of these experiments, while I happened to leave the keys K^1 and K^2 simultaneously depressed, the idea occurred to place my ear against the receiving reed shown in Fig. 3, which was trembling perceptibly to the sense of touch, but which had not been properly adjusted, so as to correspond with its proper transmitter.

"Upon placing my ear against the reed, I heard two musical tones, the unisons respectively of those produced by T^1 and T^2, seemingly proceeding from that one reed. The reed of R^1, however, was vibrating with great violence in another part of the same room, producing a tone of similar pitch to that produced by T^1, so that I was uncertain whether that tone was produced from the instrument at my ear, or whether it had been mechanically communicated to my ear through the air from the receiver R^1. To test this point, I removed the receiver R^1 from the circuit, leaving R^2, which was then in the condition shown in Fig. 3, in circuit with the two transmitters T^1 and T^2. Upon placing my ear against the receiver R^2, I then clearly perceived two tones proceeding from it, which were similar in pitch to the tones produced by the transmitters T^1 and T^2, and different from that normally produced by the reed of R^2 when plucked by the finger. This experiment was made in Salem, Mass., during the month of November, 1873."

"Int. 20. Did you afterward in your ordinary operations in the vibrations of reeds, when used as receivers, avail yourself of the phenomena described in your last answer; and if so, to what extent and for what purpose? Ans. It was constantly my custom after November, 1873, to observe the feebly forced vibrations produced in the reed of a receiver by the action of a current interrupter of different rate from its own, by placing my ear against the reed. It was my usual method of ascertaining whether to shorten or lengthen the reed of the receiver. When the tone electrically produced was lower in pitch than that produced by plucking the reed by the finger, I lengthened the free portion of the reed, but when the forced vibrations were of higher rate than the free vibrations of the reed, I shortened the vibratory portion of the reed, and thus adjusted its pitch to correspond to that produced by its proper interrupter.

The observation by Mr. Bell, at that date, "of this phenomenon of the production in the receiving reed, of feeble, forced vibrations of the same rate as the rate of the circuit interrupter, but differing in rate from the more ample vibrations which took place when the impulses came with periods corresponding to the normal rate of the receiving reed," (p. 113,) is both interesting and important, since it involves the recognition by Mr. Bell, at that time, of the fact that a receiving reed, though having a definite normal rate of vibration, and therefore a positive pitch of its own, could yet be made to respond, though perhaps feebly, with a tone corresponding in rate of vibration to that of a transmitter of different pitch; and, moreover, this could occur while the receiving reed was also, at the same time, responding with another tone, at a different pitch, corresponding to the vibrations of another transmitter.

In a word, two facts of importance were thus made known. First, that a vibrating transmitting reed could force its rate of vibration upon a receiving reed normally of another pitch; and second, that a single receiving reed could thus be made to give forth simultaneously two tones, each differing in pitch, but corresponding severally to the pitch of each of two transmitters.

It is obvious that a knowledge of these facts afforded Mr. Bell additional equipment, not only for the work immediately in hand, but also in the effort in subsequent years to transmit articulate speech.

The impression might possibly be gained from a hasty reading of the passage last cited from Mr. Bell's deposition, that he had modified his former statement, previously quoted from his preliminary statement, regarding the measure of success achieved in November, 1873, when he said: "On pressing K^1 and K^2 simultaneously, R^1 was thrown into strong vibration, but R^2 was not affected. Having no means of tuning the plate, *I was unable to make R^2 respond to the vibrations of T^2.*" But while Mr. Bell incidentally details in his deposition various means for tuning the plate that were *tried* in November, 1873, he does not state that any of these trials were *successful*, but, on the contrary, the only expression of success, "and *thus adjusted its pitch* to correspond to that produced by its proper interrupter," is in his last answer, which by its terms was expressly limited to what occurred "after November, 1873," while in the preceding answer, which was limited to what occurred "during the month of November, 1873," the language is invariably that which indicates trial, attempt and effort, as distinguished from the use of any words signifying attainment or success. Thus, "I *tried many experiments* to tune the reed of R^2, and in course of these experiments I remodeled the receiving instrument R^2, as shown in Fig. 3, and shifted the position of the reed upon its support, so as to make its free portion longer or shorter, *in the attempt* to cause its normal rate of vibration to correspond to that of its proper transmitter. I also made the free portion of the reed purposely too short, so that it should have a higher rate of vibration than that of its proper transmitter, and *sought* to lower its tone by weighting it with lumps of wax."

It is clear, therefore, from the record, that at the close of November, 1873, while Mr. Bell had transmitted sounds capable of use as signals with a single transmitter and receiver, there is no statement that he had yet been able to construct an apparatus by which two or more sounds could be simultaneously transmitted, actually and practically, so as to be capable of use as signals in telegraphy.

It should be noted, however, that during the period mentioned, some actual progress in the direction of improvements in mechanical details had been effected; and it further appears that, at the same time, knowledge had been acquired by Mr. Bell of the utmost importance, regarding the previous labors and accomplishments of others in acoustic telegraphy and in the electrical transmission of sound.

Important mechanical advantages were secured by the substitution of metallic plates for the tuning-forks first employed, as the necessary changes of pitch, in their synchronous adjustment, could be much more readily effected with the plates than with tuning-forks.

III.

Mr. Bell states that "somewhere about November, 1873, an article entitled 'The Acoustic Telegraph,' published in 'The Wonders of Electricity,' led me to substitute steel plates for tuning-forks in my telegraphic experiments."

This article, published in English in 1872, is in the record (printed in the volume "Defendants' Exhibits in Molecular Case, stipulated into "Overland Cases,' page 54), and it reads as follows:

"Wonderful as are these achievements, the inventions in telegraphy have gone still further. To be able to transmit thought to a distance is a triumph which was formerly astonishing; but we are now accustomed to it, and continue to practice it without its creating the slightest wonder. To be able to transmit handwriting, and even drawings, appeared to be still more difficult; but this problem has also been resolved, and we now hardly wonder that this feat is accomplished by means so simple. Mankind ever requires a new stimulus to its curiosity, and already it is looking forward to the discovery of more marvels in telegraphy; some years hence, for all we know, we may be able to transmit the vocal message itself, with the very inflection, tone and accent of the speaker. Already has the acoustic telegraph been invented; the principle has been discovered, and it only remains to render the invention practicable and useful—a result which, in these days of science, does not appear to be impossible.

"Sound, of whatever kind, is produced by a series of vibrations, more or less rapid, which, setting out from a sonorous body, traverse the air, and reach our ear; just as a stone dropped into a pond throws off a succession of circular undulations or water rings, so a concussion, acting on the air, produces analogous vibrations, though they are invisible, and it is when these vibrations reach the ear that we become sensible of sound.

"An eminent scientific German, M. Helmholtz, has analyzed the human voice and determined its musical value. According to him each vowel is formed by one or more notes of the scale, accompanied by other and feebler notes, which are harmonics of these. He demonstrates that it is the union of all these notes that give quality to the voice. Each syllable is formed by the notes of the vowel, accompanied by different movements of the organs of the mouth. M. Helmholtz, reflecting upon this, thinks it would be possible to construct a human voice by artificially producing and combining the elementary sounds of which it is composed.

" This is not the place to discuss such theories, but if we grant that there is any truth in them, we can understand that the acoustic telegraph can be invented and can transmit the living voice. Already experiments have been made in this direction. A vibrating plate produces a sound and, according to the rapidity of the vibrations, these sounds are sharp or flat. At each of the vibrations the plate touches a small point placed in front of it, and this contact suffices to throw the current into line; when the plate ceases to vibrate and returns to its position of equilibrium, it no longer touches the metal point and the current is consequently interrupted. By this means is obtained a series of interruptions, more or less rapid, according to the sound, the current being thrown into the line and interrupted once for each of the vibrations. At the extremity of the line the current enters an electro-magnet, which attracts another vibrating plate of size and quality identical with the former. Attracted and repelled very rapidly, exactly and as rapidly in fact as the plate mentioned above, this second plate gives forth a sound which will have the same musical value as that of the other, as the number of vibrations per second is the same in both cases.

"Should this process be perfected, it will be possible to transmit sounds by means of the telegraph—to transmit a series of sounds, a tune, or spoken sentence, and conversation. This consummation has not, however, been yet attained. Many experiments have been made, the principle has been applied in divers ways, and everything makes us hope that we will yet arrive at a perfect system of acoustic telegraphy. Advances have been made very far upon the road to success.

" A series of vibrating plates, answering to the strings of a harp, has been arranged, each of which vibrates when struck by a particular sound, and sends off electricity, to create, at the end of the line, the same vibrations in a corresponding plate; or, in other words, to produce the same sound. This system, it must be admitted, is at least very ingenious. Experiments have been made in laboratories, that is to say, under conditions entirely favorable, and such as we would not often find in actual practice. Under these conditions a musical air has actually been successfully transmitted by this acoustic telegraph.

"All must admit that this is a promising beginning, but we must not make too much haste to exalt the miracle and to extol the advantages of the future machine, or to abandon ourselves to the indulgence in indiscriminate laudation on the strength of this new discovery. That would be a gross mistake and an injury to science. True scientific faith is doubt until the truth appears in uncontrovertible clearness. Care must be taken not to take for reality that which is merely a desire on our part. We must guard against all premature exaltation, because it weakens us in the search for truth, and because even one deception is cruel. Let us therefore give to doubt, to patience and to perserverance, the place which some too readily give to congratulation."

It would appear that Mr. Bell was led by this article, not only to substitute plates for the tuning-forks previously employed, but also to adopt another mechanical expedient, which enabled him to overcome the difficulties incidental to the use of mercury, in making and breaking the circuit, which had hitherto troubled him. As stated, "The oxidization of the mercury, too, was a source of great annoyance, and was only partially obviated by covering it with alcohol." In this article, instead of a mercurial, a metallic contact was described. "At each of the vibrations the plate touches a small point placed in front of it, and this contact suffices to throw the current into line; when the plate ceases to vibrate and returns to its position of equilibrium, it no longer touches the metal point and the current is consequently interrupted." Upon turning to the sheet of drawings attached to Mr. Bell's preliminary statement, in which the figures are presented serially in chronological order (C. Vol. IV, Exhibits, p. 993), it will be observed that in each of the first six figures the cup of mercury is invariably employed to make and break the circuit at each of the vibrations of the plate or tuning-fork; but that in Fig. 7, the cup of mercury is omitted, and there is substituted a metallic contact, to wit, a screw or post point with wire connections, operating like that mentioned in said article. In the descriptive matter of the statement (Id. p. 981) it is stated that " Fig. 7 shows another form of instrument constructed during November, 1873."

In the Harmonic Caveat (C. Vol. IV, Exhibits, p. 864) it is stated regarding Fig. III, the counterpart of said Fig. 7: "The apparatus shown in this diagram is similar to that illustrated by Fig. II, excepting that the steel plate P vibrates against the extremity of a screw S, instead of making and breaking contact with a mercury connection."

But these mechanical details of the plate, and of the metallic contact points, were but trifles compared with the value of the principles set forth, and the information afforded in that article.

First, there was the distinct and intelligent assertion of the actual possibility, and the hope, in the future, of the electrical transmission of speech. "Some years hence, for all we know, we may be able to transmit the vocal message itself, with the very inflection, tone and accent of the speaker. Already has the acoustic telegraph been invented; the principle has been discovered, and it only remains to render the invention practicable and useful—a result which, in these days of science, does not appear to be impossible." Again: "This is not the place to discuss such theories, (Helmholtz') but if we grant that there is any truth in them, we can understand that the acoustic telegraph can be invented, and can transmit the living voice." And again: "Should this process be perfected, it will be possible to transmit sounds by means of the telegraph, to transmit a series of sounds, a tune, or spoken sentence, and conversation. This consummation has not, however, been yet attained. Many experiments have been made, the principle has been applied in divers ways, and everything makes us hope that we will yet arrive at a perfect system of acoustic telegraphy."

Second, it is distinctly enunciated that "the principle has been discovered," "the principle has been applied in various ways." And this principle is very clearly stated. The fundamental law of nature which must be and is the basis of all possible transmission of sound, is first distinctly set forth.

"Sound, of whatever kind, is produced by a series of vibrations, more or less rapid, which, setting out from a sonorous body, traverse the air and reach our ear. Just as a stone, dropped into a pond, throws off a succession of circular undulations or water rings, so a concussion, acting on the air, produces analogous vibrations, though they are invisible; and it is when these vibrations reach the ear that we become sensible of sound."

The mode of utilizing this law in the reproduction of sound at a distance is then broadly stated.

"Many experiments have been made, the principle has been applied in divers ways, and everything makes us hope that we will yet arrive at a perfect system of acoustic telegraphy. Advances have been made very far upon the road to success. A series of vibrating plates answering to the strings of a harp, has been arranged, each of which vibrates when struck by a particular sound, and sends off electricity, *to create at the end of the line the same vibrations in a corresponding plate; or, in other words, to produce the same sound.*"

In the general mode of operation thus set forth, its fundamental *principle* to which all else is contributory, clearly appears, to wit, that as sound is produced by vibrations which, reaching the ear, create that sensation, to reproduce those vibrations at a distance is to reproduce the sound; or, to use the very language of the article, "to create at the end of the line the same vibrations in a corresponding plate," *is*, "in other words, to produce the same sound."

Moreover, the natural order of sequence of the necessary steps in the operation is clearly indicated. A particular sound "strikes" against a plate; this sets the plate into vibration, corresponding, of course, to the vibration which produces it; this vibration of the transmitting plate "sends off electricity," which creates at the end of the line the same vibrations in a corresponding plate, thus producing the same sound. The apparatus by means of which the vibrating transmitting plate was made to send off electricity upon the line had been already described in the article in the account of the earlier experiments. "At each of the vibrations the plate touches a small point placed in front of it, and this contact suffices to throw the current into line."

The apparatus by means of which the electricity thus sent forth upon the line was made to vibrate the receiving plate had also been described.

"At the extremity of the line the current enters an electro-magnet, which attracts another vibrating plate of size and quality identical with the former. Attracted and repelled very rapidly, exactly and as rapidly, in fact, as the plate mentioned above, this second plate gives forth a sound which will have the same musical value as that of the other, as the number of vibrations, per second, is the same in both cases."

It should be noted that a material advance was also indicated in another very important particular. There were employed transmitting plates, "each of which vibrates when *struck* by a particular sound, and sends off electricity, etc." In Helmholtz' apparatus and in the earlier experiments the transmitting tuning-fork or plate was the very source or generator of the sound transmitted. But in the apparatus last described in this article, sound itself, exterior to the mechanism, acting as the motive force, impressed upon the transmitter the requisite vibrations, which were reproduced in the receiver at the other end of the line.

Finally, the statement was made that, under favorable conditions, in the laboratory, "a musical air has actually been successfully transmitted by this acoustic telegraph."

In a word, in this article the purpose of the effort and the object to be attained were distinctly announced; the fundamental principle was clearly stated; the successive steps severally indispensable to the application of the principle were specified in the natural order of their sequence; the means or apparatus employed was described; the advances already made upon these lines were detailed, while at the same time it was frankly stated that the consummation of actually transmitting speech, had not yet been attained, but remained a matter of "hope."

Mr. Bell, as we have seen, had long previously himself asserted, while yet in England, and as a result of his comprehension of Helmholtz' work, that, though he had no thought of applying himself to the task, somebody, some time, might yet solve the problem of the transmission of speech by electricity, possibly by the further development of Helmholtz' ideas.

This article, with its pronounced assertion of the eventual possibility of transmitting speech by electricity, and indicating also the underlying principles and the lines along which the solution was to be sought, and with its valuable information regarding the advances already made, must have been profoundly interesting to Mr. Bell, at that time and in confirmation of his previous views. He must also have seen, even at that early date, that a solution of the problem, if it was to be effected upon the lines and principles indicated, was closely collateral to the lines upon which he, himself, was working in the effort to accomplish multiple telegraphy. We need not be surprised if, shortly thereafter, it should appear that it became with him a subject for thought, incidental to the work upon which he was engaged; nor, if it should subsequently appear that he took up the work in earnest, exactly where it was left in this article, and carried it forward upon the same fundamental principles, but with the introduction of new principles of improvement in the subordinate steps.

We are confident that no substantial detail, appearing in the record, relating to or even throwing any light upon the history and progress of Mr. Bell's electrical and acoustical work, up to the end of November, 1873, has been omitted in the foregoing statement.

IV.

THE SECOND STAGE.

We have seen that at this time Mr. Bell had encountered the serious practical difficulty, in the development of his system of multiple telegraphy that in the plan upon which he was working "communications could be sent in only one direction."

This was a defect that must be remedied, and he saw that "one wire would suffice for communications simultaneously in both directions, if free earth communication could be secured at each end of the line."

Having become convinced "that the problem could not be solved by any arrangement of artificial resistances" he was for a time "at a loss how to overcome the difficulty."

But at length a modification of the method previously employed occurred to him which he conceived might possibly overcome the difficulty. Stated in his own language, it was as follows: "The means I proposed to employ for transmitting musical signals simultaneously in both directions along the same circuit, was to induce an intermittent current upon the line wire, by opening and closing, with extreme rapidity, the primary circuit, of an induction coil the secondary wires of which were in circuit with the line." (C. Vol. IV, Exhibits, p. 998.)

The particulars of this conception are given in detail in Mr. Bell's Preliminary Statement in Harmonic Interferences, in immediate connection with the passages already cited· (C. Vol. IV, Exhibits, p. 982.)

"Early in December, 1873, it flashed across me that the intermittent current might be induced upon the line wire, in which case there would be no difficulty in having free earth communication at both ends of the circuit.

"The arrangement as conceived is shown in Fig. 11. I saw also that the duplex principle could be applied as in Fig. 12, so as to double the number of messages possible upon the acoustical plan. I felt that the time had come for seeking assistance in carrying out the plan.

"My own circumstances prevented me from taking any pecuniary risks in attempting to bring out the system here. I therefore contented myself with working quietly at the theoretical details of the invention, trusting to the future for assistance.

"I came to the conclusion that a single battery would work a large number of transmitting instruments, as the steel plates, in vibrating, made and broke contact at different rates of speed, and for the same reason that each transmitter would act with the full power of the battery, even if all should be worked simultaneously.

"I also speedily decided that a single induction coil would answer for all the transmitters at each station, as shown in Fig. 13. The application of the duplex principle, by doubling the induction coil, is shown in Fig. 14.

"During the summer of 1874, doubts occurred as to the operation of the induced current. When the primary circuit of an induction coil is closed, a momentary impulse of positive electricity is induced upon the secondary circuit, and when it is opened an impulse of negative electricity appears upon the secondary wire. I feared that the induced current would be insufficient to set the armatures of the receiving instruments in vibration, unless the negative impulses, come exactly midway between the positive impulses and unless armatures of the receiving instruments were rendered permanently magnetic so as to be alternately attracted and repelled by their electro-magnets. The thought occurred of inducing the impulses by means of a permanent magnet, instead of a battery.

It is obvious that the foregoing purports only to be a narration of the mental conceptions and conclusions arrived at by Mr. Bell, during this period, when he was devoted to the study of the theoretical development of the details of the the invention.

This intent of the statement is made clear by the terms of the language invariably employed. Just previously he had stated:

"I therefore from this time (November, 1873), devoted less time to practical experiment than to the theoretical development of the details of the invention," while the language now employed is: "Early in December, 1873, it flashed across me that the intermittent current *might be* *induced* upon the line wire, etc." "The arrangement *as conceived* is shown in Fig. 11. I *saw* also that the duplex principle *could be* applied as in Fig. 12, etc."

But it must be noted here, that if we turn to Mr. Bell's deposition given nearly three years later than the date of the foregoing statement, and take up the narration where it was left at the last citation from that deposition (C. Vol. I, p. 113), a somewhat different impression is produced by the language employed.

"Int. 21. How early did you arrange your multiple telegraph instruments with an induction coil placed between the interrupter and the receiver? Ans. In the winter of 1873; I think about December.

"Int. 22. State whether the drawing now shown you is a correct representation of the manner in which you arranged the apparatus with an induction coil, and state when and for what purpose this drawing, Figs. 4, 5 and 6 was made? Ans. Figs. 4 and 5, represent correctly the manner in which I arranged the apparatus with induction coils, in December, 1873, and Fig. 6 represents an improvement of the arrangement, devised about the commencement of the year 1874. This drawing, Figs. 4, 5, and 6, was made previously to April 27, 1876, and formed part of the illustrations of my preliminary statement in the harmonic-telegraph interference before referred to. (Fig. 4 corresponds to Fig. 11, Fig. 5 to Fig. 12, and Fig. 6 to Fig. 13.

Any possibility of question in the matter is, however, rendered impossible by the testimony given during the cross-examination, as follows:

"Cross-Int. 225. Did you practically try the arrangement which you so conceived in December, 1873, for inducing the intermittent current on the line wire? A. I did not at that time.

"Cross-Int., 226. At what time did you? A. I made numerous experiments with induction coils in the winter of 1874 and 1875; but I can not be certain that the full arrangement of circuit shown in Fig. 4 was tried, but I believe it was; I, at all events, remember experimenting with a single induction coil, having an interrupter and receivers arranged as in Fig. 4, and I remember changing the interrupter, substituting for it an interrupter of different rate of vibration. The point I am uncertain about is as to whether a number of induction coils were used, as in Fig. 4. The arrangement shown in Fig. 5 was not tried. I can not fix the dates of these experiments otherwise than the winter of 1874 and 1875. They might have been as early as the 1st of November, 1874." (C. Vol. II., page 188.)

V.

We next come, in order of time, to a most interesting part in the history, to wit, the narrative by Mr. Bell of the train of reasoning by which he was led to the conception of the employment of the magneto-electric current, and also of the circumstances under which he conceived of the "harp apparatus" for transmitting sound.

It is somewhat remarkable that, as stated by Mr. Bell, this train of reasoning had its origin or beginning in the very "doubt" or fear regarding the possible operation of the intermittent induced current already mentioned.

Accounts of the conception of the harp apparatus given by Mr. Bell appear in the record in his London Lecture, (C. Vol. IV, Exhibits, p. 896); in his Preliminary Statement in Harmonic Interferences (C. Vol. IV, Exhibits, p.984); in his Preliminary Statement in Speaking Telephone Interferences (C. Vol. IV, Exhibits, p. 998), and in his deposition (C. Vol. I, p. 118).

The chain of reasoning by which Mr. Bell states that he was led up to the conception, is given with the fullest detail in his Preliminary Statement in Speaking Telephone Interferences, as follows:

"In developing my plan of multiple telegraphy, certain difficulties made their appearance, and I devoted myself during a summer vacation spent in Canada, in 1874, to devising means to overcome these difficulties and also to devising new methods of studying sound optically, as aids in teaching articulation to the deaf. The means I proposed to employ for transmitting musical signals simultaneously in both directions along the same circuit was to induce an intermittent current upon the line wire, by opening and closing with extreme rapidity the primary circuit of an induction coil, the secondary wires of which were in circuit with the line.

"Upon reasoning out the effects produced I saw that a current in one direction would be induced in the secondary circuit when the primary circuit was closed, and a current in the other direction when it was opened, and I feared that the alternate positive and negative impulses would be insufficient to set my receiving instrument into musical vibration, unless these impulses, which acted upon the plate or spring, were at equal intervals apart, and the plate or spring which constituted the armature of the receiving electro-magnet was itself permanently magnetic, so as to be attracted and repelled, as the pole of the electro-magnet was changed by the reversal of the current.

"To make this plate permanently magnetic I proposed to attach it to one pole of a permanent magnet.

"It then occurred to me that if this magnetic vibrating plate or armature were set in motion mechanically, it would induce positive and negative currents like those which I had proposed to send through the instrument to set the armature in vibration; I then saw that two similar instruments might be placed in a circuit, and that the vibration in the armature of one would produce corresponding vibration in the armature of the other; and if the vibration of the armature of the inducing instrument was such as to produce a musical tone, the corresponding vibration of the other armature would produce the same musical tone.

"It will be understood, of course, that both armatures were to be tuned to the same pitch.

"I then conceived the plan of attaching a number of springs, of different musical pitch, to each pole of a permanent horse-shoe magnet, so that the two sets of springs should lie in parallel planes; between the ends of these springs, which by their attachment to the permanent magnet became themselves magnets, an oblong electro-magnet was to be placed. The vibration of any one or more of the springs would induce corresponding electric currents in the electro-magnet when its circuit was closed, and if a second similar instrument was placed in the circuit I conceived that the armatures of this instrument would vibrate which corresponded in pitch to those which were vibrating in the first instrument, and would give out the same musical tones.

"It then occurred to me that not only would the armatures of the second instrument respond to notes of similar pitch, but that the loudness of the sounds produced would be dependent upon the amplitude of vibration of the armatures of the first instrument, for the strength of the electrical impulses produced by the armatures of the first instrument would depend upon the amplitude of their vibration, and the amplitude of the vibration of the armatures of the second instrument would depend upon the strength of the electrical impulses; hence, if a number of armatures of the first instrument were to be set simultaneously in vibration with different relations of force, the corresponding armatures of the second instrument would be thrown into vibration with corresponding relations of force.

It at once occurred to me that the results obtained by Helmholtz in the reproduction of vowel sounds might be obtained by this instrument. Helmholtz obtained his effects by causing tuning-forks of different pitch to vibrate simultaneously, increasing the loudness of the sounds by external re-enforcement by means of resonators. It seemed to me that the same result could be obtained by causing the armatures of my instrument to vibrate with greater or less force, and that this could be done by simply uttering a sound in the neighborhood of the first instrument. When a sound is uttered in the neighborhood of a musical instrument, like a piano or harp, each vocal sound is analyzed by the instrument into its component musical elements, and those strings of the piano or harp which correspond in pitch to the fundamental and overtones of the sound are thrown sympathetically into vibration by the action of the air, and the relative amplitudes of the vibrations of the different strings correspond to the relative loudness of the fundamental and overtones of the sound. Hence, I conceived that if a sound should be uttered in the neighborhood of the first instrument, certain of the armatures, corresponding in pitch to the fundamental and overtones of the sound uttered, would be thrown into vibration with the proper relations of force, and the armatures of the second instrument, corresponding in pitch to the fundamental and overtones uttered, would be thrown into vibration with corresponding relations of force, and would thus produce a sound having the same components as the original sound. Reflecting upon this arrangement and its likeness to the internal organ of hearing in the human ear, known as Cortis' organ, convinced me that if we could have a multitude of armatures, comprehending the whole scale of musical sounds audible to the human ear, the successive notes being so close together as only to differ infinitesimally from one another in pitch, then upon speaking to such an instrument the consonant and vowel sounds affecting the armatures of the first instrument would be reproduced by the armatures of the second instrument. In fact, sounds or noises of any kind made in the neighborhood of the first instrument would be reproduced by the second instrument.

"All these reflections occurred during this visit to Canada in the summer of 1874."

The form of the theoretical construction of the apparatus is described in the Preliminary Statement in Harmonic Interferences, as follows:

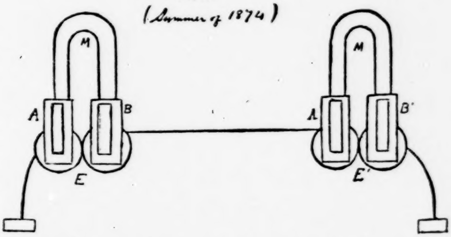
"During the summer of 1874, doubts occurred as to the operation of the induced current. When the primary circuit of an induction coil is closed, a momentary impulse of positive electricity is induced upon the secondary circuit, and when it is opened an impulse of negative electricity appears upon the secondary wire. I feared that the induced current would be insufficient to set the armatures of the receiving instruments in vibration, unless the negative impulses came exactly midway between the positive impulses, and unless armatures of the receiving instruments were rendered permanently magnetic, so as to be alternately attracted and repelled by their electro magnets. The thought occurred of inducing the impulses by means of a permanent magnet instead of a battery."

"When a permanent magnet is caused to approach the pole of an electro-magnet, a current of electricity is induced in the coils of the latter; and, when it is made to recede, a current of opposite polarity to the first is induced in the electro-magnet. The vibration, then, of a permanent magnet, in front of the pole of an electro-magnet, would produce an oscillating current in the coils of the latter; and the reversed impulses be at equal distances apart.

"The form which this idea took at this time (summer of 1874), is shown in Fig. 15.

FIG 15

(Summer of 1874)



"A B, A^1 B^1 are steel reeds attached to permanent magnets M M,^{1} vibrating by wind in front of the poles of electro-magnets, E E.^{1} A and B were to be of different pitch, and A^1 B^1 to be their counterparts, respectively. When A should be made to produce its musicalnote,

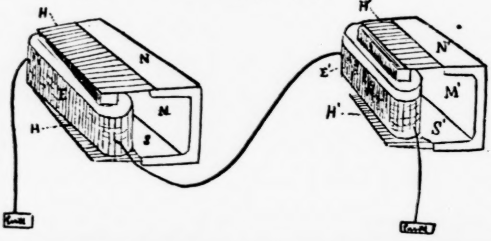
A^1 (its unison) would be thrown into vibration; for, when A moved downward, the current induced upon the circuit would cause the poles of the electro-magnet E^1 to be of opposite polarity to A^1 and B,^{1} and therefore A^1 would be attracted downward; but, when A should move upward, the polarity of E^1 would be the same as A,^{1} and therefore A^1 would be repelled. As the normal rate of vibration of A^1 coincides with that of A, the former would respond to the latter's vibration, and *vice versa*, but neither B nor B^1 would be affected.

"Reflection led me to believe that this idea was very valuable, as the currents induced in the coils of the electro-magnets E E^1 would correspond exactly to the effects produced in the air by the passage of a musical note. The polarity of each induced impulse would depend upon the direction of the motion of the permanent magnet A, to or from the pole of the electro-magnet under it, and hence would correspond to a condensation or rarefaction of air. The succession of induced impulses would be at the same rate per second as the vibrations of A, hence would correspond to the pitch of the note produced; and the intensity of each impulse would depend upon the extent or amplitude of the vibrations of A, and would correspond to the loudness of the resulting note.

"The idea gradually developed, that notes differing in loudness as well as pitch could be simultaneously transmitted, and as a corollary, the feasibility of the transmission of the timbre or quality of a sound suggested itself; for according to Helmholtz' theory, the quality of a sound depends upon the simultaneous production of a number of musical notes differing from each other in pitch and loudness. In each sound the fundamental or lowest tone is the loudest, the overtones being comparatively weak and faint.

"The apparatus shown in Fig. 16 was conceived as a means of transmitting vocal utterance telephonically.

FIG. 16 (Summer of 1874)



"Steel rods were to be attached at one end to the poles N. S, of a permanent magnet M, as in Fig. 16. An electro-magnet E, was to be placed between the two sets of rods H. H. An exactly similar instrument H¹ H¹ was to be placed upon another part of the circuit.

"Upon uttering a sound in the neighborhood of H, it was presumed that certain rods would be set sympathetically in vibration by the voice. The rod corresponding to the fundamental tone would vibrate forcibly, and those corresponding to the overtones of the sound would respond faintly. Each rod partaking of the polarity of the pole N or S, to which it was attached, would induce in the coils of the electro-magnet E, a series of electrical oscillations corresponding in rate per second to the number of its vibrations, and in intensity to the amplitude of its motion. The electrical impulses traversing the coils of the electro-magnet E¹ would cause vibrations in the corresponding rods H¹ H¹. The unison of the fundamental tone would respond loudly; and the rods corresponding in pitch to the overtones would vibrate feebly. Although the absolute loudness of all the sounds produced by the rods H¹ H¹ would be very faint, still the relative loudness of the notes would be preserved; and herce, theoretically, a repetition of the sound uttered in the neighborhood of H H, should proceed from H¹ H¹.

"Fearing that ridicule would be attached to the idea of transmitting vocal sounds telephonically, especially by those who were unacquainted with Helmholtz' experiments, I said little or nothing of this plan. Indeed, reflection convinced me that, however feasible the scheme looked upon paper, it was impracticable, as the induced currents would be far too feeble to overcome any great resistance. For the same reason the plan shown in Fig. 15 seemed impracticable save in theory; and I began to look about for some other method of inducing alternate positive and negative impulses which should succeed each other at equal intervals of time; and at last I hit upon the plan of making and breaking contact by means of a revolving cylinder, as shown in Fig. 17."

We are now enabled, from the data given in the foregoing statements, to arrive at a very clear comprehension of the mental processes and the general course of reasoning through which Mr. Bell's mind passed during the period mentioned.

In the first instance, he was confronted by the fact that there was a serious defect inherent in the plan upon which he had been working in the development of the multiple telegraph.

This plan involved the use of a battery current, which could be employed in connection with constant earth communication at one end only of the line. Messages, therefore, could be sent in only one direction, to wit, toward the end having free earth communication.

In considering this difficulty, it at length flashed across him that if, instead of throwing the battery current directly upon the line, an intermittent current could be *induced* thereon, there would then be no difficulty in having free earth communication at both ends of the circuit. In such case the entire circuit, from end to end and through the earth, would never be broken, and each "impulse" induced thereon would pass through every station, whatever its relative direction on the line.

It was a well known law of electricity that when the primary circuit of an induction coil is closed, a momentary impulse of positive electricity is induced upon the secondary circuit, and when it is opened an impulse of negative electricity appears upon the secondary wire.

The means which he proposed to himself to employ, in the application of this law, was to induce an intermittent current upon the line wire, by opening and closing with extreme rapidity the primary circuit of an induction coil, the secondary wires of which were in circuit with the line.

But here again theoretical difficulties were encountered. In the former plan, with the battery current thrown directly upon the line, the current was uniform in polarity and continued upon the line during the entire closing of the circuit. Consequently the electro-magnets in the receivers upon the line retained their attractive power as long as the circuit was closed, and were also constant in their polarity.

But in the new plan the alternate opening and closing of the primary circuit induced in the line wire, alternately, positive and negative impulses, which were, however, only momentary in duration.

In consequence the electro-magnets in the receivers upon the line would only be energized so as to attract their armatures during an instant of time.

Upon reasoning out these effects, he saw reason to fear that the alternate positive and negative impulses would be insufficient to set the receiving instrument into musical vibration, unless these impulses should come at equal intervals, and unless the plate or spring which constituted the armature of the receiving electro-magnet was itself made permanently magnetic, so as to be attracted and repelled as the pole of the electro-magnet was changed by the reversal in polarity of the current.

In order to make this plate permanently magnetic, he proposed to attach it to one pole of a permanent magnet.

As Mr. Bell has stated in his patent, it had "long been known that when a permanent magnet is caused to approach the pole of an electro-magnet, a current of electricity is induced in the coils of the latter, and that when it is made to recede a current of opposite polarity to the first appears upon the wire."

The brilliant thought at once occurred to Mr. Bell that this law could be made available for his purpose by simply providing a transmitter with an electro-magnet, and with an armature which could be set in vibration mechanically, at a definite rate. These very vibrations, by inducing upon the line alternately positive and negative currents, would then set the receiving armature into corresponding vibrations.

This was exactly what he wanted, as the line circuit would, upon this plan, always remain complete and unbroken, and the required free earth communication would be secured at both ends of the line. Moreover, the working of these instruments upon the line would be such as to produce effects perfectly adapted to meet the requirements of multiple telegraphy. As illustrated in Fig. 15: "When A should be made to produce its musical note, A^1 (its unison) would be thrown into vibration; for when A moved downward, the current induced upon the circuit would cause the poles of the electro-magnet E^1 to be of opposite polarity to A^1 and B,^{1} and therefore A^1 would be attracted downward; but when A should move upward, the polarity of E^1 would be the same as A,^{1} and therefore A^1 would be repelled. As the normal rate of vibration of A^1 coincides with that of A, the former would respond to the latter's vibration, and *vice versa*, but neither B nor B^1 be affected."

By mental processes, which not only evinced a thorough knowledge of the fundamental principles of electricity, but abilities of a very high order in theoretically applying those principles, and by a chain of reasoning which was clear, logical and without a flaw, he had at length arrived at the conception of a plan which wholly overcame the serious difficulty with which he had been confronted, and which at the same time afforded a theoretically perfect solution of the problem of multiple telegraphy.

And yet, strange to say, he utterly neglected "to lay hold of the promise," and though he had the means at hand in Boston, magnets, electro-magnets, vibrating armatures and a line wire, not till June 2, 1875, did he make the slightest test to determine whether this magneto-electric current would fulfill the required conditions.

This appears from Mr. Bell's own statements, upon cross-examination. (C. Vol. II, pages 1595–1607.)

"Cross-Q. 327. And when did you for the first time actually put together and experimentally operate the combination of instrumentalities as shown in figure 5 of said patent drawing (of the patent of March 7, 1876)? Ans. June 2, 1875."

"Cross-Q. 330. How long prior to June 2, 1875, had you had in your possession instruments substantially like the magneto receivers or transmitters shown in figures 5 and 6? Ans. The instruments shown in figures 1 and 3, pages 109 and 111 of my deposition (see *ante* page 13), I had in November, 1873, as there stated. I consider them substantially the same for the purposes of this question, though there are some differences of construction which I can explain if required. The instruments of figure 5 of the patent are improved forms of the same receiving instruments shown on pages 109 and 111 of my deposition. I should think that such instruments might be substituted for those shown in figures 5 and 6 of the patent, with substantially the same results."

"Cross-Q. 345. With two instruments in your possession, substantially such as shown at the ends of the circuit represented in figure 5 of the patent of March 7, 1876, and with a battery in your possession and wires for the transmission of the currents, how much time would it require to connect said two instruments by the wires, with or without the battery in the circuit, and pluck one of the reeds to ascertain whether the other would respond with an audible sound? Ans. A very short time if I had thought of trying the experiment in Boston, in Mr. William's establishment, where the instruments were kept; but a much longer time if the experiment had occurred to me in Salem, Massachusetts, where I was there residing, a distance of about eighteen or twenty miles from Boston.

"Cross-Q. 346. I suppose you mean it would have taken a longer time to get to and from the instruments, but not a longer time when you were in their presence, do you not? Ans. Certainly.

"Cross-Q. 347. Inasmuch as you had in your possession the instruments, the wires, and the battery, the experiment could have been made at any time from the summer of 1874 to June 2, 1875, when you happened to be in the presence of the instruments, without the expenditure of one penny of the capital of yourself, Mr. Hubbard, or Mr. Sanders; could it not? Ans. I think so, although the instruments in my possession in the autumn of 1874, being of my own construction, I felt were too roughly made for me to obtain from them even the results intended for the purposes of multiple telegraphy as satisfactorily as from similar instruments properly made. The first instruments made by a skilled mechanic, in the winter of 1874, were not so suitable for the purposes of the experiment referred to in the question."

The remarkable fact that Mr. Bell did not even think of trying the experiment, no longer appears to us strange, when we comprehend the fact that, all this time, it was also his absolute conviction that these induced magneto-electric currents would be far too feeble to overcome any great resistance, and so, indeed, exceedingly weak that no useful effect would be produced by them.

He turned his attention to other modes of working out his plan of multiple telegraphy, and at last hit upon the plan of making and breaking contact by means of a revolving cylinder, as shown in Fig. 17.

VI.

But it is not at all surprising, in the light of the previous history, that just at this point Mr. Bell, for the first time in his life, so far as we have any record, addressed himself, personally, to the theoretical solution of the problem of the electrical transmission of speech. Nor is it remarkable that almost immediately he arrived at a conception of a complete apparatus, with which he proposed to effect the solution.

He had been taught in the article on the acoustic telegraph, which he had read but a short time previously, that there was a well founded hope that the problem would be solved eventually by somebody. He had there been shown that, unquestionably, the lines upon which the solution was to be sought lay alongside of the very lines along which he was proceeding toward the hoped for solution of the problem of multiple telegraphy.

He had been taught there also the fundamental principle of transmission, that, as sound is the sensation produced by vibration and is determined by the character of that vibration, to reproduce by electricity in a receiver the identical vibrations occasioned by a sound in a transmitter is to reproduce that sound.

In that article there had also been described to him an apparatus with which such a degree of success had been attained, in the practical embodiment of that principle, that a musical air had actually been reproduced in the receiver. As there stated: "A series of vibrating plates, answering to the strings of a harp has been arranged, each of which vibrates when struck by a particular sound and sends off electricity, to create at the end of the line the same vibrations in a corresponding plate; or, in other words, to produce the same sound. This system, it must be admitted, is at least very ingenious. Experiments have been made in laboratories, that is to say, under conditions entirely favorable, and such as we would not often find in actual practice.

Under these conditions a musical air has actually been successfully transmitted by this acoustic telegraph."

It had been found impossible, however, to transmit speech through that apparatus. Sounds varying in pitch had been thus transmitted, but nothing more. Sonorous vibrations had been reproduced, which corresponded in *rate* with the original vibrations, but neither in *amplitude*, or in any other respect. So much had been accomplished, however, that it was obvious that success was to be obtained, not by a departure from the principle, but by an improvement in the apparatus, which should secure a more perfect application of the principle, and that, therefore, the work must be carried forward, if at all, in precisely this direction.

Mr. Bell had been led by a chain of reasoning arising out of the exigencies of his work upon the multiple telegraph, to an intelligent comprehension of the theoretical working of the magneto-electric current. It now flashed across him that this current was precisely the instrumentality which, theoretically, fulfilled all the requirements recognized as necessary for the electrical transmission of speech.

It is evident from his statement that it became immediately apparent to him that there was a most wonderful adaptation in this induced current for use as an instrumentality in the proposed reproduction of speech by electricity.

His professional work had made him thoroughly familiar with acoustics and the recognized laws of sound propagation. He knew that sound is transmitted through the air by a rapid succession of alternate condensations and rarefactions, occasioned by the vibration to and fro of each particle of the air in aerial impulses or wave movements, and that the pitch of the sound is preserved by the constant and unaltered rate of these vibrations, while its loudness is always determined by their relative amplitude.

Reflecting upon these characteristics of the aerial sound vibrations, and comparing them with the essential qualities of the magneto-electric current, induced as proposed, he almost intuitively discerned the intimate correspondence between the impulses of current induced in the circuit by the sonorous vibration of the transmitting armature, and the pulsations or vibrations communicated through the contiguous air by the passage of the characteristic note of that armature. Thus, fundamentally, the very constitution of this "oscillating current," made up of a continued succession of "reversed impulses," flowing in opposite directions upon the circuit, was seen to correspond exactly to the essential constitution of the aerial movement which takes place in the transmission of a sound, with its characteristic to and fro motion of the air particles in alternate condensations and rarefactions.

As he states: "The currents induced in the coils of the electro-magnets E E^1, would *correspond exactly* to the effects produced in the air by the passage of a musical note. The polarity of each induced impulse would depend upon the direction of the motion of the permanent magnet A to or from the pole of the electro-magnet under it, and hence would correspond to a condensation or rarefaction of air."

This correspondence to a condensation or rarefaction of air was indeed wonderful, leading to an almost absolute perfection in theory. Let a sound, for example, in unison with the characteristic note of a magnetic transmitting armature or plate, be uttered in the vicinity of that plate, and the aerial impulses traversing the air in the transmission of that sound, by their two-fold action upon the plate, actually set it into vibration (a fact noted by Mr. Bell in the very opening of his statement C. Vol. IV, Exhibits, p. 977). Each condensation advancing till it comes into contact with the surface of the plate, pushes it away by its superior pressure, or seemingly repels it, while the instantly following rarefaction, creating a partial vacuum before the surface of the plate, occasions, for the moment, a superior pressure upon its opposite side, and thus exerts a pulling or seemingly attractive force upon the plate. The interplay of the two forces, acting in opposite directions, causes a complete vibration of the plate.

It is fundamental in acoustics that these condensations and rarefactions are always associated together, in rapid alternations or "pulses," in the aerial propagation of a sound. Nowhere is there any distinction made, either as to their relative importance or as to the comparative degree of force actually occasioned by either, in their joint production of a complete vibration.

The to and fro movements of the air particles, constituting a sound vibration, are equal in extent, and the resulting condensations and rarefactions, forming a sound wave, vary equally in degree from the normal density of the air, and consequently are equally potent in impressing upon the plate a "sympathetic vibration." *

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*NOTE.—"When a sounding body causes another body to emit sound, we have an instance of a very remarkable phenomenon called *resonance*. The German term for it, "co-vibration" (Mitschwingung), possesses the merit of at once indicating its essential meaning, namely, the setting up of vibrations in an instrument, not by a blow or other immediate action upon it, but indirectly as the result of the vibrations of another instrument."

"Suppose a heavy weight to be suspended from a fixed support by a flexible string, so as to form a pendulum of the simplest kind. In order to cause it to perform oscillations of considerable extent, by the application of a number of small impulses, we proceed as follows: As soon as, by the first impulse, the weight has been set vibrating through a small distance, we take care that each succeeding impulse is impressed *in the direction in which the weight is moving at the time*. Each impulse, thus applied, will cause the pendulum to oscillate through a larger angle than before, and, the effects of many impulses being in this way added together, an extensive swing of the pendulum is the result."

"For the sake of simplicity, let us suppose that we are dealing with a *second's* pendulum; *i, e.*, one of such a length as to perform one complete oscillation in each second, and therefore to make a single forward or backward swing in each half-second. It will be clear, from what has been said above, that the most rapid effect will be produced on the motion of the pendulum, by applying a forward and a backward impulse respectively during each alternate half-second, or, which is the same thing, administering *a pair of to and fro impulses during each complete oscillation of the pendulum*. We have a simple instance of such a proceeding in the way in which a couple of boys set a heavily-laden swing in violent motion. They stand facing each other, and each boy, when the swing is moving away from him, helps it along with a vigorous push.

The above considerations enable us to explain how a sounding-fork excites the vibrations of another fork in unison with itself, through the medium of the intervening air. When a continuous musical note is being sounded, we know that, at any one point we choose to fix upon, the air is undergoing a series of rapid changes, becoming alternately denser and less dense than it would be were the sound to cease. The increase of density is accompanied by an increase of pressure; its diminution by a diminution of pressure.

Having thus clearly apprehended some of the simplest and most fundamental laws of acoustics, we can more thoroughly appreciate, as did Mr. Bell, the *exact correspondence* between these successive condensations and rarefactions, forming the aerial pulses which produce the sensation of sound, and the impulses of electricity induced in the circuit by the very vibrations these condensations and rarefactions set up in the magnetic armature plate.

Thus, when a continuous musical note is being sounded through the air, and the transmitting armature plate is vibrating in unison with it, at any aerial vibration we choose to fix upon, the impulse of condensation impinging upon the plate, by its pressure, co-acting with the elasticity or spring of the plate, pushes it toward the pole of the electro-magnet. This approach, or forward movement of the plate, induces in the coils of the electro-magnet and along the

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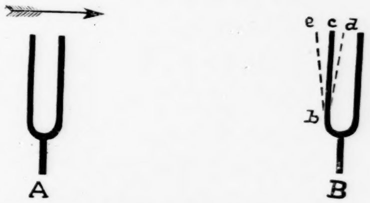
Fig. 21.



Let A, Fig. 21, be the sounding-fork, B that whose vibrations are to be excited by resonance, and let us consider the effect of the alternations of pressure on the air at *c* on the prong *bc*. The increase of pressure will tend to move the prong into the position *bd*; its subsequent diminution will facilitate the elastic recoil of the fork, supported also by the superior density of the air on the other side of the prong, and thus tend to bring the prong into the position *be*, further to the left of its original position, *bc*, than *bd* was to the right of it. Thus the alternate condensations and rarefactions of the sound-waves impress on the fork B corresponding impulses in opposite directions.

One pair of such impulses is applied regularly during each complete vibration of B, since they are due to the vibrations of A, which is in unison with B. Further, for the small extent of vibration with which we have here to deal, the prongs of a tuning-fork move exactly according to the same law as a pendulum. Accordingly, these air-impulses are applied under precisely the conditions which we found to be most favorable to the rapid development of vibratory motion. The large number of such impulses which succeed each other in a few seconds make up for the feebleness of each by itself." *The Science of Music, or the Physical Basis of Musical Harmony.* By Sidley Taylor, M. A., Late Fellow of Trinity College, Cambridge. D. Appleton & Co., 1875, pages 58–60.

entire circuit, and in the coils of the electro-magnet in the receiver, an impulse of electricity flowing in one direction upon the line; its duration, or the interval of time occupied in its passage, is exactly equal to the duration of the impulse of aerial condensation, as represented by the endurance of the forward movement it imposes upon the plate; while its relative intensity is exactly proportionate to the relative extent of the impulse of condensation, as measured by the length of the movement traveled by the plate in that interval of time.*

The original impulse of aerial condensation is instantly followed by an equally pronounced impulse of rarefaction. This impulse, by the counter pressure it engenders upon the plate, co-acting with its elasticity or spring, impels it in the opposite direction and away from the pole of its electro-magnet. This recession or backward movement of the plate induces in the circuit, and in the coils of both the transmitting and receiving electro-magnets, an impulse of electricity flowing in the opposite direction from the first impulse, and likewise corresponding in duration and in relative intensity to the duration and relative length of the aerial rarefaction. As expressed by Mr. Bell in an analogous case: "The succession of induced impulses would be at the same rate per second as the vibrations of A, hence would correspond to the pitch of the note produced; and the intensity of each impulse would depend upon the extent or amplitude of the vibrations of A, and would correspond to the loudness of the resulting note."

As the aerial wave movement of vibration, made up of these impulses of forward and backward pressure, in succeeding condensations and rarefactions, is the precise force which produces the sensation of sound in the ear, the possible translation or conversion of that force into another form, which should, however, still preserve all its essential characteristics, but which could act at a distance in the reproduction of the original force with the same fidelity, was an idea which, as we have seen, reflection led Mr. Bell to believe was "very valuable."

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*NOTE.—Int. 35. Why and how would the amplitude of the vibration of the transmitting reed control the amplitude of the vibration of the receiving reed? Ans. I understand from the well known laws of magneto-electricity that a current of electricity would be induced in the coils of the electro-magnet E, Fig 7 (15), when any one of the transmitting reeds A moved downward or upward, and that the strength of the current would be proportional to the velocity of the motion of the reed. I therefore inferred that as the velocity of motion of the reed was increased, that the strength of the current produced by the vibration was also increased. (C. 1, page 117, Bell.)

> "It then occurred to me that not only would the armatures of the second instrument, (in the proposed harp apparatus,) respond to notes of similar pitch, but that the loudness of the sounds produced would be dependent upon the amplitude of vibration of the armatures of the first instrument, for the strength of the electrical impulses produced by the armatures of the first instrument would depend upon the amplitude of their vibration, and the amplitude of the vibration of the armatures of the second instrument would depend upon the strength of the electrical impulses; hence, if a number of armatures of the first instrument were to be set simultaneously in vibration *with* different relations of force, the corresponding armatures of the second instrument would be thrown into vibration with corresponding relations of force."

The theory conceived was perfect in itself, as far as it went, but Mr. Bell was still restricted within the limitations of his knowledge at that time.

He knew that, "according to Helmholtz' theory, the quality of a sound depends upon the simultaneous production of a *number* of musical notes differing from each other in pitch and loudness. In each sound the fundamental or lowest tone is the loudest, the overtones being comparatively weak and faint."

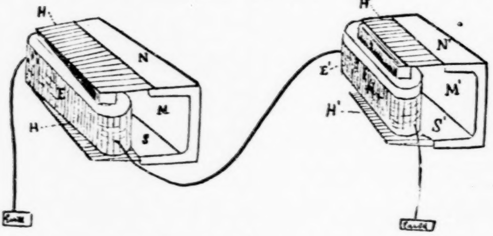
He knew also that, by the harp apparatus described in the article mentioned, in "*The Wonders of Electricity*," provided with its double series of vibrating plates, tuned respectively in unison, and placed one in the transmitter and the other in the receiver, that any number of musical tones could be transmitted and reproduced in the receiver, preserving however but the single quality of *pitch*. Reflecting upon the use of the induced magneto current, "the idea gradually developed that notes differing in loudness, as well as pitch, could be simultaneously transmitted, and as a corollary, the feasibility of the transmission of the timbre or quality of a sound suggested itself."

It appeared, therefore, to him that it would only be necessary to make percisely the same change in the transmitter of the harp apparatus described in that article that he had already planned to make in his multiple telegraph transmitter, to insure theoretically the successful transmission of speech.

A simple comparison of the descriptions of the old and the newly devised apparatus will show that this was exactly the form and the modification assumed in his conception.

Indeed, the description given in Baile's article applies very well to the drawing now made by Mr. Bell illustrating his conception, it being understood, of course, that in the former case there was a "make and break" in the current, instead of the induced current in an unbroken circuit, included in Mr. Bell's conception.

FIG. 16 (Summer of 1874)



"A series of vibrating plates, answering to the strings of a harp, has been arranged, each of which vibrates when struck by a particular sound, and sends off electricity, to create at the end of the line the same vibrations in a corresponding plate; or, in other words, to produce the same sound."

VII.

This consideration, however, by no means detracts from the high character of Mr. Bell's conception, which affords one of the finest examples of what Mr. Tyndall has termed the scientific use of the imagination, in dealing mentally with forces and movements that are unseen, but none the less real.

Mr. Bell, by a careful study of the fundamental laws of both acoustics and electricity, and by continued reflection upon their possible interplay and co-action, had arrived at a distinct intellectual recognition of the exact correspondence in movement and in every phase of that movement between the aerial impulses, which produce the sensation of sound and the electrical impulses, which they might be made to induce in a closed circuit.

Here was a possible instrumentality, the use of which was in perfect accord and directly in line with the fundamental principle upon which his predecessors had labored, to wit: the reproduction of the sound by the reproduction in the receiver of the identical vibrations imposed by the sound upon the transmitter. The instrumentalities previously employed were imperfect, inasmuch as they reproduced in the receiver vibrations which corresponded in rate only with the vibrations of the transmitter, and consequently reproduced the sound in the single quality of *pitch* alone; or, as expressed in Baile's article: "Attracted and repelled very rapidly, exactly and as rapidly in fact as the plate mentioned above, this second plate gives forth a sound which will have the same musical value as that of the other, as the number of vibrations per second is the same in both cases."

The new instrumentality would, theoretically, carry forward the work a long step in advance, for, from the essential character of its movement, it must reproduce in the receiver vibrations which would correspond with those of the transmitter in rate and in amplitude as well, so as to reproduce the sound in the qualities of both *pitch* and *loudness*.

The harp apparatus described in Baile's article was provided with a *series* of tuned vibrating plates in both transmitter and receiver, that a number of tones might be simultaneously transmitted in compliance with the requirements of Helmholtz's theory regarding the production of the *quality* of a sound as distinctly referred to in that article.

Mr. Bell also adopted this theory, which is presumably a correct one, so far as musical notes and vowel sounds are concerned. The only course available to him, in the light of the knowledge possessed by him at that time, was therefore to devise a simple re-arrangement of that harp apparatus so that it would operate by induction, instead of by a making and breaking of the circuit. He would thereby effect a substitution of the magneto-electric current for the interrupted battery current previously employed as the intermediate instrumentality.

But it must be noted here, as an important fact, that this apparatus, as conceived by Mr. Bell, still contained a radical defect which incapacitated it from ever becoming useful as a practical telephone. This defect, however, did not lie in the nature of the magneto-electric current to be induced in its operation, but it was inherent in the *mechanism* employed, both in the transmitter and the receiver.

Each of the steel rods, springs or armature plates, as Mr. Bell has respectively termed them, clamped at its extremity into the transmitter, was to be turned to a musical pitch, or dominant rate of vibration (C. IV, Exhibits p. 999), while the armature plates in the receiver were also to be tuned respectively in unison with the transmitting plates.

In consequence of this construction each plate, in both transmitter and receiver, would practically respond only to tones of its own pitch, so that sounds running through all those variations of tone lying between the standard pitches of any two successive plates, and which contribute so essentially to the quality of speech, could neither be taken in by the transmitter, nor, much less, be sounded forth by the receiver. Unless, indeed, in the language of Mr. Bell, "we could have a multitude of armatures, comprehending the whole scale of musical sounds audible to the human ear, the successive notes being so close together as only to differ infinitesimally from one another in pitch," which would obviously be wholly impracticable.

Even then, such steel rods or plates, tuned each to a particular note, so as to be in unison with its mate, when set into vibration, would give forth each a clear, musical tone, and their united effect would obviously be only combinations of musical tones. Musical airs could thus be transmitted; vowel sounds, which are essentially musical tones, might possibly be reproduced, but the consonants and the consonantal elements of articulate speech would find no adequate expression.

Mr. Bell, nine years later, in March, 1883, when the telephone and the necessary conditions of its practical construction were thoroughly understood, expressed himself regarding this subject as follows (C., Vol. II, p. 1699, X-Q 618):

> "For the purpose of reproducing *timbre* we want a combination that will vibrate as little as possible after a law of its own, and as much as possible after the law of the vibrations impressed upon it, so that substantially it has no tendency to vibrate after a law of its own, but will copy with substantial fidelity the form of the vibrations impressed upon it." And again (Id., p. 1669, X-Q 542): "A free-tuned reed, like that shown in Fig. 5, (of the patent) had a strong tendency to vibrate after a law of its own, and it was difficult to make it move at any other rate, or in any other manner, than that which was normal to it; but the mechanical structure of the apparatus, shown in Fig. 7, adapted it to vibrate with substantially equal freedom at all rates and in any manner, so that it could copy the shape or the form of any vibration. Now, the quality or *timbre* of a sound is characterized by the shape or form of the vibration that causes it, and hence no apparatus can reproduce *timbre* that is not capable of copying with substantial accuracy the form of a vibration."

This view regarding the requirements of the case is also adopted by counsel for complainants in their "Brief for

Complainants on Final Hearing" in the court below, page 43, as follows:

"As many messages can be transmitted (by Mr. Bell's harmonic telegraph), as there are notes, subject always to certain limitations due to the mechanical and electrical operations which have to be performed. This operation has not necessarily anything to do with the transmission of speech. It generally requires for its best efficacy contrivances which are fatal to the transmission of speech. But one style of instrument which Mr. Bell devised for the harmonic telegraph did have a novel kind of electrical device, which he afterward utilized in the speaking telephone.

"But he utilized it for the two purposes in a very different way and by very different kinds of contrivances. For the harmonic telegraph, as he made it, it was essential that each instrument should vibrate to its own particular pitch and none other, while the character or "*quality*" of the sound acting upon it or produced by it is of no consequence. For the speaking telephone it is essential that the instrument have, as nearly as possible, no note, no will of its own, but shall respond equally to all pitches, while the one essential thing is that it shall take note of the *quality* of the sound acting upon it, and copy that *quality* in the sound produced by it; and furthermore that the operating cause at the transmitting station which produces all the changes, shall be the sound waves themselves."

The fundamental principle upon which the original harp apparatus was based was demonstrably right. The new application of the induced current of electricity to its operation was also theoretically correct in principle; but defects in the mechanical construction of the apparatus as devised still rendered it imperfect and incomplete, and its successful use wholly impracticable.

This was clearly a case where the work of *invention* was still required before a practical telephone could be given to the world.

Mr. Bell himself seems, even at this time, not to have been altogether content with his conception, for we find that, still theorizing, he turned to the consideration of other possible appliances, which perhaps might be utilized to better advantage in inducing the magneto-electric current.

Continuing the narration as given in perhaps the clearest form in his preliminary statement, in Speaking Telephone Interferences (C. IV Exhibits, p. 1001), and commencing at the termination of the last quotation, he says:

"All these reflections occurred during this visit in Canada in the summer of 1874. At the same time, as I have already mentioned, I was making an optical study of sound for the purpose of exhibiting to the eyes of the deaf the shapes of the vibrations due to vocal sounds, so that they might compare these shapes with the shapes which they, in their own attempts to produce sounds, saw exhibited in the manometric flame of Kœnig.

"For that purpose I had taken with me to Canada a human ear, in hopes that I might be able to use the ear itself as a phonautograph, as suggested to me by Dr. Clarence J. Blake, of Boston, who kindly lent me the ear to experiment with. I have still in my possession a number of glass plates, with tracings of the vibrations of the human ear caused by uttering different vowel sounds. These tracings bear dates in July and August, 1874, which dates were made upon the plates at the time the tracings were taken.

"Studying these tracings in connection with Helmholtz's researches, I was led to see that they represented graphically the resultant vibration of the air caused by the fundamental and overtones of the voice. I was also struck with the fact that so small and delicate an organ as the membrane of the ear should be able, from the impulses of the air, to put in motion the comparatively large and massive bones contained in the tympanum.

"Helmholtz has pointed out that a graphical representation of the vibrations of the air caused by a simple musical tone, or in other words, a simple pendulous vibration, is a simple curve of a peculiar kind, called a sinusoidal curve, and that the graphical reresentation of the vibration of the air, caused by a sound of any other kind, is the resultant of a number of sinusoidal curves superposed, one upon the other, representing graphically the fundamental and overtones that go to make up the sound.

"I conceived in like manner that an analogous electrical effect would be produced upon the line wire between the first and second instruments previously described, caused by the superposition of currents due to the vibrations of the armatures corresponding to the fundamental and overtones of the sound uttered.

"I was thus led to the idea that a single armature might be put in motion in such a way as to produce directly a current which should correspond to the resultant current due to the vibration of the armatures, which would respond to the fundamental and overtones of the sound.

"The question then arose in my mind whether an armature might not be set in motion by a membrane similar in shape and structure to that in the human ear, so as to produce a current which should correspond to the vibrations of the air. I did not, at this time, devise any method of combining a membrane with an armature, or attempt to construct any apparatus upon the plans I had conceived.

"I never constructed the instrument which I have described, made up of a number of armatures attached to a permanent magnet and tuned to different pitches, and which I had devised with special reference to multiple telegraphy, because I thought that the currents which would be induced would be so exceedingly weak that no useful effect would be produced by them, corresponding to what I had theoretically attributed to them. I therefore turned my attention to other modes of working out my plan of multiple telegraphy, which I was thoroughly bent upon reducing to practice immediately. I did, however, explain to my father and to other friends in Canada, my ideas as they occurred. When I returned to Boston in September or October, 1874, being without means for prosecuting my experiments, I made arrangements with Mr. Sanders and Mr. Hubbard to furnish funds for the prosecution of my experiments, and to enable me to patent my inventions. At their earnest request, I devoted myself to the development of my system of multiple telegraphy, and applied for patents in the winter of 1874 and 1875.

"I did, however, shortly after my return from Canada, have several interviews with Dr. Blake, for the purpose of showing him the experiments I had made, and of obtaining further information with regard to the structure and mechanism of the human ear, to aid me in my efforts to devise a method of producing vocal sounds electrically; and we carried on, conjointly, a series of experiments to obtain tracings of the vibration of the bones of the human ear. At one of these interviews I explained to him the various plans which had occurred to me for multiple telegraphy and the transmission of speech, and I made a number of rude sketches in his presence, illustrating these plans. Among them is to be found a sketch of an instrument showing two free reeds or springs attached to the poles of a permanent magnet, and surrounded like harmonium reeds, with casings adapting them to be vibrated by wind. Another figure, on the same sheet, exhibits two horseshoe permanent magnets with their poles placed opposite each other, surrounded by helices forming part of an electric circuit. Between the poles of the magnets, vibrating reeds are placed, which were to be of steel. The mechanical vibration of these reeds would produce electrical currents alternately in one direction and the other, and varying in strength at different parts of the vibration of the reeds, so as to produce an undulatory current regular in point of time, but varying in strength during any single vibration of the reed, in proportion to the different velocity of the reed in the different parts of its path.

"On the same sheet is a representation of the instrument I have before referred to, when several springs were attached to the poles of a permanent magnet, having between them the poles of an elongated electro-magnet, over a portion of which each spring could vibrate.

"I am certain that I made sketches of these devices while in Canada, but I am unable to find any earlier than those given to Dr. Blake.

"I had an apparatus constructed for a receiving instrument, in which a free reed, to be set in vibration by an electro-magnet and produce a musical tone, was attached to the pole of a permanent magnet. This was in the winter of 1874 and 1875, and is described in one of my applications for patents made in February, 1875.

"While in Washington attending to this business I called upon Prof. Henry and explained all my inventions to him. His appreciation encouraged me very much, and he pronounced my plan for the electrical production of articulate speech the germ of a great invention.

"I recollect explaining to him the idea of an instrument with a number of armatures tuned to different pitches, which I have before described, and it was with reference to this apparatus that he made the above remark.

"He showed me the various electrical and acoustical instruments which he had in the Smithsonian Institute, including Reis' telephone. I had previously seen in the Institute of Technology, in Boston, the receiving instrument of Reis' telephone, and was acquainted with the construction of the whole apparatus by diagrams and printed descriptions; but I had never before seen the transmitting portion of the apparatus. We had some conversation about the mechanical power of stretched membranes. I can not recollect the details of it, but I remember that the effect of his remarks was rather discouraging as to my being able to obtain the results from a stretched membrane which I had hoped. I remember that the impression left upon my mind was that each stretched membrane would have a rate of vibration peculiar to itself."

The foregoing passage is a recital in concise terms of the circumstances under which Mr. Bell was led to make another important advance in the theoretical development of the proposed invention.

Helmholtz taught him that the vibration of the air particle caused by a simple musical note is a simple "pendulous" vibration; that its motion is governed by the same laws applicable to the pendulum movement.

(It is interesting to note that this had been mathematically demonstrated by Sir Isaac Newton in his *Principia*. His Proposition 47, Book III, is headed as follows:

"When pulses are propagated through a fluid, every particle oscillates with a very small motion, and is accelerated and retarded by the same law as an oscillating pendulum.'')

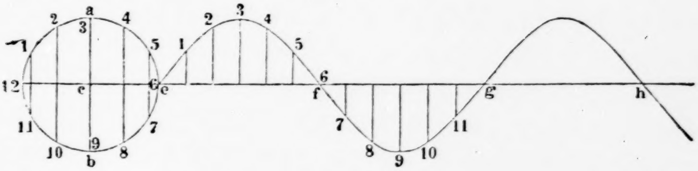
In accordance with these laws, for example, the vibrations of the air particles are all made in the same definite period of time, corresponding to the *pitch* of the tone, whatever might be the amplitude of the vibration. From the extremity of the vibration, the motion of the air particle, commencing, increases or accelerates till it comes to the middle, whence it diminishes till it ceases at the extreme limit upon the opposite side; when the return movement in reverse direction occurs with the same variations.

The *rate* of the increase or acceleration of motion in approaching the center, and of the decrease in departing from it, is greatest at the extremities and least at the center, where change is made from increase to decrease.

These characteristics determine mathematically the exact form of the curve which graphically represents the movement of any body or particle put into "pendulous vibration."

Helmholtz pointed out that this curve, which thus represents graphically the air vibration caused by a simple musical tone, is a simple curve of a peculiar kind, called a sinusoidal curve.

"The law of these vibrations (simple or pendular) may be popularly explained by means of the construction in Fig. 10.



"Suppose a point to describe the circle of which C is the center, with a uniform velocity, and that an observer stands at a considerable distance in the prolongation of the line e h, so that he does not see the surface of the circle, but only its edge, in which case the point will appear merely to move up and down along its diameter, a b. This up and down motion would take place exactly according to the law of pendular vibration. To represent this motion graphically by means of a curve, divide the length e g, supposed to correspond to the time of a single period, into as many (here 12) equal parts as the circumference of the circle, and draw the perpendiculars 1, 2, 3, etc., on the dividing points of the line e g, in order, equal in length to and in the same direction with, those drawn in the circle from the corresponding points 1, 2, 3, etc. In this way we obtain the curve drawn in Fig. 10, which agrees in form with that drawn by the tuning-fork, Fig. 6, p. 206, but is of a larger size. Mathematically expressed, the distance of the vibrating point from its mean position at any time is equal to the sine of an arc proportional to the corresponding time, and hence the form of simple vibrations are also called the *sine vibrations* [and the above curve is also known as the *curve of sines*."]

(Helmholtz's Sensations of Tone, page 23, note.)

Helmholtz also pointed out that any musical sound, being itself a resultant or composition made up from a fundamental and overtones, causes a vibration of the air which is represented graphically by a curve, which is also the resultant made up from the superposition of the several sinusoidal curves representing the constituent tones.

Mr. Bell, in the course of his practice with the phonautograph and his study of its tracings when a vocal sound was uttered into the instrument, was led to see and to appreciate the fact that these tracings represented graphically this resultant vibration of the air.

The value of this observation lay in the fact that, taken in connection with Helmholtz' researches, it showed that while the fundamental and overtones were actually transmitted together by the vibration of each air particle lying in the course traveled by the sound, the air particle itself passed through a singular definite motion, the resultant, mathematically considered, of the several motions characteristic of the fundamental and the overtones respectively.

Mr. Bell was thus led directly to the conception that in his proposed "harp apparatus," the electrical impulses induced upon the single line by the simultaneous vibration of a number of armature plates, each vibrating in a different manner, would coalesce each instant into a single resultant impulse, the duration, direction and intensity of which would be determined by the *algebraical* sum of the several impulses being induced upon the line at that instant by the vibrating plates. All the impulses that were being induced in one direction at the instant being added in their intensity, and likewise those being induced in the opposite direction, the resultant impulse would continue in the direction of the impulses whose sum was the greater, and with an intensity equal to the difference between the two sums. And the movement would continue in that direction until the balance between the two sums at any instant was reversed, when the resultant impulse would also be reversed in its direction. This electrical movement could therefore, be represented graphically by the curve which would be the *algebraical* sum or composition of the several curves representing the electrical movements induced by each of the vibrating plates. This would be in *exact analogy* to the character of the similar resultant movement of the air vibration and its graphical representation, as pointed out by Helmholtz.

The discernment of this wonderful correspondence between the movements of the proposed electrical impulses and of the sonorous air vibrations in the vital characteristics of duration, direction and intensity, led Mr. Bell directly to the perception that the same mathematical laws applicable to the aerial impulses were equally applicable to the induced electrical impulses.

This reasoning led Mr. Bell to a further conception of the greatest importance. With the proposed harp apparatus the sound, in accordance with Helmholtz' theory, would first be resolved into its constituent tones by the vibrations it imposed upon a series of plates of different pitch, and then the currents induced by these vibrations would in turn be recomposed into a single resultant current.

Mr. Bell accordingly conceived the idea that precisely the same *resultant* electrical current that would exist upon the line wire in the use of the harp apparatus might be induced directly by a *single* armature, provided it was put into motion corresponding to the "resultant motion" of the air particles in the actual transmission of the sound; or as expressed by Mr. Bell.

"I was thus led to the idea that a single armature might be put in motion in such a way as to produce directly a current which should correspond to the resultant current due to the vibration of the armatures which would respond to the fundamental and overtones of the sound."

With this last conception Mr. Bell had attained to a full and definite comprehension of the *principle* of his proposed method of transmitting speech by electricity.

Even the fine points in the theoretical development of this principle appear to have been closely apprehended by Mr. Bell. Thus, for example, Helmholtz had stated a general proposition regarding the physical basis of the "quality" of a sound as follows:

"On inquiring to what external difference in the waves of sound the different qualities of tone correspond, we must remember that the amplitude of the vibration determines the force or loudness, and the period of vibration the pitch. Quality of tone can therefore depend upon neither of these. The only possible hypothesis, therefore, is that the quality of tone should depend upon the manner in which the motion is performed within the period of each single vibration."

We find that this was recognized and provided for by Mr. Bell in the statement of the fact that these induced currents would conform to the required conditions by their exact correspondence to the varying movements of the armature within the period of each single vibration. Referring to the reed instruments, already described, sketches of which he showed to Dr. Blake, he pointed out this very characteristic as follows: "The mechanical vibration of these reeds would produce electrical currents alternately in one direction and the other, and varying in strength at different parts of the vibration of the reeds so as to produce an undulatory current, regular in point of time but varying in strength during any single vibration of the reed in proportion to the *different velocity* of the reed *in the different parts of its path.*"

VIII.

But, though the *principle* of the proposed method was definitely conceived and apparently thoroughly understood, the *invention* was by no means complete, even in theory; to say nothing regarding that practical embodiment of the principle in a working apparatus which must exist to constitute the actual completion of an invention.

There could be no transmission of articulate speech, even in theory upon his plan, until Mr. Bell had devised such an arrangement of a single armature that its movements would actually correspond to the resultant movements of the air vibrations in the transmission of sound.

This was indeed indispensible, and the very first requisite to enable the principle to be brought into play, by the induction of electrical impulses which would correspond to these air movements.

Here was a practical problem, and one by no means easy of solution.

One can not readily appreciate, at the present time, the perplexities and the difficulties which had to be encountered in devising, even theoretically, an arrangement of a single metallic armature, so that it would respond freely in movements actually corresponding, in every detail of motion, to each and every air vibration. It was not a question of mere adjustment or mechanical skill, for much more was involved, and so much that, though the principle should prove to be correct, and the electrical impulses adequate to the work, the faculty of *invention* would still have to be effectively exercised before the world could possess a practical working telephone.

A moments consideration will afford us a glimpse of the nature of the difficulty encountered.

Of course the armature must be a body capable of induction action and therefore metallic, preferably iron or steel. By reference to the drawings attached to his preliminary statement, it will be seen that every armature previously employed by Mr. Bell in his harmonic telegraph experiments, (always in the receivers in connection with "make and break" transmitters) had been *clamped* at one extremity, leaving the other end free for vibration before the electro-magnet. This clamping of the armature affixed upon it a certain definite normal rate of vibration, tuning it to one pitch, and, as he has repeatedly pointed out, it would respond only to vibrations of its normal rate and would remain silent and unresponsive to the influence of vibrations of a different rate.

This was a characteristic exactly adapted to the purposes of multiple telegraphy, and even there he found that it was necessary that both the vibrating circuit breaker and the armature in the receiver should be tuned to *exactly* the same pitch, or normal rate of vibration, in order to obtain any responsive sound from the receiving armature.

Obviously, then, this construction was wholly inadequate for the purpose of transmitting speech. It could only induce electrical impulses which would correspond in their movements to air vibrations of one particular rate, to wit, the normal rate of vibration of the armature. Its service would, therefore, be limited to the transmission of musical tones of one definite pitch, while the reproduction of articulate speech would still remain unaccomplished.

But this is only a marked exemplification of the real nature of the difficulty, out of which arose the perplexities of the case.

It is a familiar principle in acoustics that every body, whatever its form, has its own normal rate of vibration, due to its molecular structure, and varying according to its shape and the conditions of its arrangement. Even a body of air enclosed in a tube open at both ends has its normal rate of vibration determined by the relative length of the tube; and this property of the air is utilized in the arrangement of pipes in musical instruments. Discs and even diaphrams have, likewise, their normal rates of vibration, proportioned to their thickness and the degree of their tension.

It is also well known that this property is most persistent in the metals, especially iron and steel, owing to their greater density in connection with their elasticity. Again, the form or shape given to a metallic body has great influence upon the relative power and persistency of this force. This is exemplified in the case of the bell, which has been found to be of the form best adapted to intensify this quality. This property or force was a serious obstacle to the electrical transmission of articulate speech, *before it was successfully accomplished.* It was a necessity that an apparatus should be devised, which would enable the air particles, always feeble in their individual force, to actually *overpower* the molecular forces exerted, not only in resistance to any responsive movement of the armature, but, positively, to force this movement into a particular rate of vibration, a rate differing from the constantly varying rates successively sought to be forced upon it by the modulations of the voice in speaking.

It was a delicate problem, and, if ever there was one that called for the exercise of ingenuity, experiment and invention in its solution, this was a fair example.

We find that Mr. Bell at once addressed himself to the theoretical consideration of the problem, and we see evidences very quickly displayed that he thoroughly appreciated the inherent difficulties of the case. He had previously been "struck with the fact that so small and delicate an organ as the membrane of the ear should be able, from the impulses of the air, to put in motion the comparatively large and massive bones contained in the tympanum," and in studying the problem now presented, "The question then arose in my mind," he says, "whether an armature might not be set in motion by a membrane similar in shape and structure to that in the human ear, so as to produce a current which should correspond to the vibrations of the air."

He states, however, very frankly, "*I did not at this time devise any method* of combining a membrane with an armature."

statement, it will be seen that every armature previously employed by Mr. Bell in his harmonic telegraph experiments, (always in the receivers in connection with "make and break" transmitters) had been *clamped* at one extremity, leaving the other end free for vibration before the electromagnet. This clamping of the armature affixed upon it a certain definite normal rate of vibration, tuning it to one pitch, and, as he has repeatedly pointed out, it would respond only to vibrations of its normal rate and would remain silent and unresponsive to the influence of vibrations of a different rate.

This was a characteristic exactly adapted to the purposes of multiple telegraphy, and even there he found that it was necessary that both the vibrating circuit breaker and the armature in the receiver should be tuned to *exactly* the same pitch, or normal rate of vibration, in order to obtain any responsive sound from the receiving armature.

Obviously, then, this construction was wholly inadequate for the purpose of transmitting speech. It could only induce electrical impulses which would correspond in their movements to air vibrations of one particular rate, to wit, the normal rate of vibration of the armature. Its service would, therefore, be limited to the transmission of musical tones of one definite pitch, while the reproduction of articulate speech would still remain unaccomplished.

But this is only a marked exemplification of the real nature of the difficulty, out of which arose the perplexities of the case.

It is a familiar principle in acoustics that every body, whatever its form, has its own normal rate of vibration, due to its molecular structure, and varying according to its shape and the conditions of its arrangement. Even a body of air enclosed in a tube open at both ends has its normal rate of vibration determined by the relative length of the tube; and this property of the air is utilized in the arrangement of pipes in musical instruments. Discs and even diaphrams have, likewise, their normal rates of vibration, proportioned to their thickness and the degree of their tension.

It is also well known that this property is most persistent in the metals, especially iron and steel, owing to their greater density in connection with their elasticity. Again, the form or shape given to a metallic body has great influence upon the relative power and persistency of this force. This is exemplified in the case of the bell, which has been found to be of the form best adapted to intensify this quality. This property or force was a serious obstacle to the electrical transmission of articulate speech, *before it was successfully accomplished.* It was a necessity that an apparatus should be devised, which would enable the air particles, always feeble in their individual force, to actually *overpower* the molecular forces exerted, not only in resistance to any responsive movement of the armature, but, positively, to force this movement into a particular rate of vibration, a rate differing from the constantly varying rates successively sought to be forced upon it by the modulations of the voice in speaking.

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The problem was evidently of too difficult a nature to be solved immediately upon its statement. Although his attention had been turned generally to the consideration of a membrane and a metallic armature as instrumentalities which might possibly be so combined as to effect the result sought, it appears that he was unable as yet to devise any method of so combining them as to even theoretically accomplish the purpose.

Upon Mr. Bell's return to Boston he still gave his attention to the problem and sought out Dr. Blake, as he says, "for the purpose of showing the experiments I had made, and of obtaining further information with regard to the structure and mechanism of the human ear to aid me in my efforts to devise a method of producing vocal sounds electrically." *

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*Mr. Cross has testified as follows (C. Vol. 2, page 1727):

"Q. 34. From the first part of 1874, when you became acquainted with Mr. Bell, up to the beginning of June, 1874, did you see him much or little? Ans. I saw him very frequently.

"Q. 35. During the following winter, from the fall of 1874 to the spring of 1875, did you meet him? and if so, how much? Ans. I continued to see him frequently, though not so often as the preceding spring.

"Q. 36. Did he or not, during that winter, speak to you about the electrical transmission of speech? and, if so, did he state to you any conception he had as to how it could be accomplished, and did or did not his mind appear to you to be much occupied on that subject? Ans. We conversed together at that time regarding the transmission of speech. I understood that he proposed to do this by means of electrical undulations, and that these undulations were to be produced by the vibration of a reed in front of a magnet. At some time during this winter he communicated to me the idea of vibrating the reed by means of a membrane.

"The subject of the transmission of speech was one which evidently occupied his thoughts, and to accomplish which he was striving to develop an efficient method.

"Q. 37. Did you form any opinion at that time as to the theoretical adequacy and perfection of the undulatory current method which he then disclosed to you? Ans. As soon as the method itself was described, I saw that it was theoretically perfect; and therefore, in theory, adequate to the transmission of speech.

"Q. 38. Did you form any opinion at the time, and if so, what, as to the practicability of accomplishing it according to that method of employing an armature and membrane vibrated by the voice to generate the undulatory current relied upon? Ans. I supposed, at that time, that the effect produced by the vibration of an armature would be entirely too small to accomplish the desired end.

"Q. 39. Did he or did he not, during that winter, speak to you of the employment, for purposes of multiple telegraphy, of currents produced by the sonorous vibrations of a reed armature in front of an electro-magnet? Ans. He did.

"Q. 40 Did you form any opinion at that time as to the practicability of em-

A more detailed account of the nature of the information sought by Mr. Bell at this time is given in his deposition (C. Vol. I, page 123):

"Int. 50. Did you have any conversation on that occasion with Dr. Blake as to whether the human voice could vibrate the membrane with attached armature, and if so, state what, and whether any drawings were made by either of you to illustrate that topic. A. I have a recollection of asking Dr. Blake's opinion on this point, and the impression that I got from his remarks was that it could if the membrane were made concave, like that in the human ear, and if the end of the armature were attached, not to the center of the membrane, but to a point a little to one side, corresponding to the point of attachment of the malleus and tympanic membrane of the ear.

"I do not recollect whether any drawing was made of this idea at that time, but I remember our discussing the operation of the harp arrangement, marked "Fig. 4," in Exhibit 30, and comparing the apparatus to the organ of Corti in the human ear. I remember also that Dr. Blake suggested that a damping arrangement would have to be attached to the harp arrangement, and that he made a drawing of the manner in which the rods of Corti were damped in the ear."

Dr. Blake, however, in his version of the matter, goes much further in his statement in some respects, than does Mr. Bell.

He says (C. Vol. I, page 337, *et seq.*) that not only was the subject discussed generally, but a mode of combining a membrane and an armature was mentioned, to wit, taking an improved phonautograph, with the stylus hinged at the periphery of the membrane and moved by a piece of wood

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ploying currents so produced for the purpose of harmonic multiple telegraphy, and if so, what is it? Ans. This plan seemed to me to involve far less difficulty than the transmission of speech. I did not consider very fully what difficulties might be found with it in practice.

"Q. 41. Did you know, during that winter and spring, or did you hear, during that winter and spring, of anything in his condition and surroundings which was calculated to prevent him from devoting his time and attention to experimental work concerning the electrical transmission of speech; and if so, what was it? Ans. I understood that his means were very limited, so that he was obliged to confine himself very closely to his classes, which necessarily occupied a great part of his time. I also understood that he was under obligation to certain persons to devote his attention and experimentation exclusively to multiple telegraphy."

connecting it with the center of the membrane and simply substituting a metal reed for the hinged stylus, or, in a word, using a metal stylus with its pen point cut off.

He also makes the somewhat remarkable statement that neither he nor Mr. Bell had any doubt but that the strength of the induced electrical impulses would be sufficient for the purpose, and that no difficulties were anticipated "except so far as purely mechanical difficulties were concerned in the use of animal membranes," and that thereafter his "interest in the experiments of Mr. Bell became less,'' because he had apparently attained the solution of the problem of the electrical transmission of speech.

"Int. 4. Did he describe to you any electrical apparatus in which a membrane was to be used? If so, please tell me what that apparatus was. A. Yes; an apparatus in which one metal reed was substituted for the several metal reeds, of the harp last mentioned, this one reed being actuated by a membrane to which it was to be attached, which membrane was to be set in vibration by the tone of the musical instrument or by the human voice.

"Int. 5. Did you have any discussion with him as to the character of the membrane, or mode of arrangement of the membrane and armature, and if so, state what was said on that subject at that interview by both of you. A. Yes, the idea of Prof. Bell, as communicated to me, was this: That if the simple pendulous vibration of a metal reed could be communicated to a second reed, electrically connected with the first, more complicated vibrations communicated to the metal reed from a musical instrument or the human voice, through the medium of the air, could also be electrically transmitted. To accomplish this purpose, it was, according to his idea, advisable to attach the metal reed to a membrane, which would reproduce the aerial vibrations produced by a musical instrument or the human voice, substituting a metal reed in fact for the stylus of the improved Morey phonautograph, and of the *membrana tympani* phonautograph with which he had been experimenting. I then suggested, as an experiment, since his principal object was the electrical transmission of articulate speech, that the metal reed should be brought in contact with the human *membrana tympani*, suitably prepared and mounted for the purpose.

"Cross-Int. 47. If I understand you, Mr. Bell had not tried the experiment at that time, but only proposed it as a possible solution of the question. Am I correct? Ans. So I understood him.

"Cross-Int. 49. Did he anticipate any difficulty in accomplishing the object by that proposed means, or express any fear that it might not practically answer the purpose? Ans. None, except so far as purely mechanical difficulties were concerned in the use of animal membranes.

"Cross-Int. 50. Did you express the opinion that the strength of the electric currents generated in that way would be sufficient to reproduce in the receiving reed the same vibrations as were imparted to the transmitting reed? Ans. Yes. I am not aware that the doubt occurred to either of us.

"Cross-Int. 60. Did you have any talk with him about telephones between the time of that interview and the beginning of 1877? Ans. I did.

"Cross-Int. 61. When, and how often? Ans. I can not recall dates—at long intervals, I think, because after the date of this interview in October my interest in the experiments of Mr. Bell became less, as he had apparently attained the solution of the problem concerning which he consulted me, namely, the transmission of articulate speech electrically.

"Cross-Int. 62. When did your interest begin to decrease in consequence of your belief that he had attained the result he was aiming at? Ans. At or soon after the date of this interview in October."

"Cross-Int. 79. At that interview who first suggested the employment of a membrane, you or Prof. Bell? Ans. Prof. Bell told me that, as the results of his experiments with a membrane phonautograph, he had conceived the idea of a way in which speech could be electrically transmitted. I replied, 'I think that I know how you would accomplish it, by making a membrane actuate a mental stylus.' Mr. Bell replied, 'That is precisely my idea. If a membrane like the human *membrana tympani* moves a weight such as that of the ossicles, a membrane having a metal reed attached to it should move that reed in response to the human voice.' His further idea, as communicated to me, was, that by means of this arrangement undulations should be produced in an electric current corresponding to the undulations of the air produced by the human voice.

"Did he ask your opinion as to whether the human voice could or could not vibrate a membrane with a stylus or armature attached? Ans. Yes."

"Cross-Int. 86. What answer did you give to his question? Ans. That it could, if proportioned properly to the membrane, but that I doubted if a plane membrane would reproduce with sufficient accuracy the sound waves resulting from the human voice.

"Cross-Int. 87. And then you went on to suggest bringing the metal reed in contact with the human *membrana tympani,* suitably prepared and mounted for the purpose, did you not? Ans. Yes."

"Cross-Int. 98. Had he experimented with the phonautograph at the Institute of Technology? Ans. So I understood.

"Cross-Int. 99. What was the construction of that instrument? Ans. That of the ordinary membrane phonautograph, with the stylus hinged at the periphery of the membrane and moved by a piece of wood connecting it with the center of the membrane.

"Cross-Int. 100. What was the diameter? Ans. I can not remember exactly; I should think about six inches."

"Cross-Int. 101. About how long was the stylus? Ans. I can not remember exactly; I should think between twelve and eighteen inches, including the pen at its extremity.

(Mr. Bell has described the construction of the phonautographs used by him as follows. C. Vol. I, page 114:)

"Int. 23. When, if ever, did you become familiar with the Scott phonautograph referred to in Prof. Cross' twenty-eighth answer, page 395? Ans. In the winter of 1873–74.

"Int. 24. Did you during that winter construct any phonautographs yourself? A. I did; early in 1874.

"Int. 25. In those that you constructed how was the rod which carried the style attached to the phonautograph frame, and how was it moved by the membrane? Ans. One end of the rod was hinged by means of a piece of leather or calico to the edge of the circular frame carrying the membrame. A small piece of cork was fastened to the center of the membrane and to the rod. Upon uttering a sound in the neighborhood of the membrane, it was caused to vibrate, and force the rod to vibrate also. The free end of the rod projected considerably beyond the opposite edge of the membrane, and its vibrations were recorded on smoked glass."

It does not appear that Dr. Blake was, after all, of much or any service to Mr. Bell in aiding him toward the coveted solution of the difficult problem which he knew *must* yet be solved before there could be any successful transmission of speech by electricity.

In fact, the more the problem is studied the more serious is seen to be its nature. Even the sanguine doctor, in considering the phonautographic animal membrane with its proposed attachment to a hinged metal stylus, is compelled to doubt (and very justly) whether, under such circumstances, "a *plane* membrane would reproduce with sufficient accuracy the sound waves resulting from the human voice."

The deep perplexities of the case arose from the fact that there were two difficulties encountered, both of them severely practical, but each in antagonism to the other, so that the very conditions which would remove one would intensify the other, and yet they must both together be surmounted in a single structure.

On the one hand, the armature must be so arranged that in some way it shall present a reasonable surface to receive the impact of the air particles, and at the same time be so thin, so easily vibrated and so delicately poised that, notwithstanding its inertia, and in spite of the force with which it would vibrate after a law of its own, it would yet respond freely, instantly and sympathetically to every sonorous air vibration. Moreover, what is of even more vital importance to the transmission of articulate speech, because it lies at the basis of the *quality* of sounds, it must accurately respond to that ever varying and often abruptly changing velocity of the air particles in the different parts of their vibration.

On the other hand, and in direct opposition to these conditions, the armature must also contain sufficient metal, preferably iron or steel, and be of such size and weight that its approach and recession before an electro-magnet, within the exceedingly narrow ranges of its movement, should yet be so potent as to induce upon the circuit electrical impulses of sufficient strength to set the receiving armature into corresponding audible vibrations.

These were the actual conditions of the problem as they presented themselves to Mr. Bell in 1874. He had arrived at a clear apprehension of a *principle* which fulfilled all the theoretical requirements of the case, and which might, possibly, be capable of a practical application which would be of great value to the world.

But the *invention*, the actual embodiment of that principle in a working apparatus, had yet to be accomplished.

The conditions, moreover, were so perplexing, and the difficulties so apparently insurmountable, that they actually produced even in Mr. Bell's mind a state of positive *incredulity* as to the practicability of any solution of the problem upon these lines.

Complainants' expert, Mr. Pope, has set forth very clearly one phase of the difficulty, as it must have appeared to Mr. Bell, as follows (C. Vol. 2, page 1293):

"Very little was known, at that date, as to the actual mechanical effects which were capable of being produced by the sonorous atmospheric vibrations accompanying the production of ordinary sounds, such for example, as those produced by the human voice. Perhaps the only application of this force to produce an appreciable result, which was at all well known at that date, was the phonautograph, so called, in which the vibrations of a membrane produced by sound waves were made to move a bristle over a surface of smoked glass through a very small range of vibration. The power required to effect this was inconceivable in amount.

"On the other hand, all the different kinds of apparatus then known for the transmission of signals by magneto-electricity, such, for example, as the dial telegraphs of Wheatstone, of Siemens, and of Highton; the needle telegraph of Highton, and the magneto Morse Key of Siemens and Halske, required the exercise of a considerable degree of mechanical force upon the armature of the transmitter, in order to communicate a slight movement to the delicate armature or needle of the receiver; the mechanical effect produced at the receiver in each of these instruments being probably not more than one per cent. of that exerted upon the transmitter.

"In view of the state of knowledge at the date of the patent, it could hardly have been supposed that a magneto-generator, moved by a force no greater than that which served to move the bristles of the phonautograph, would under any circumstances be able to generate an electric current which would produce upon a receiving instrument any effect whatever, which would be perceptible to the senses."

We can now appreciate, in a measure, the complex nature of the problem, and the practical difficulties involved in its solution.

We can also understand what would otherwise have been inscrutable, how it happened that Mr. Bell himself, up to June 2, 1875, regarded his plan as so "impracticable," and was so utterly incredulous of its success, that he could not bring himself to perform a single experiment, or to make the slightest test tending to determine the correctness of his theory, or the possibility of its practical application. This was the case, although he had the means at hand, membranes, armatures, electro-magnets and line wire, together with the expert assistance of Mr. Watson for a number of months, and although a test experiment could have been made by simply arranging together two of the magneto receivers, already employed for multiple telegraph purposes, and with little or no trouble, and at no cost whatever, either in time or money. (C. Vol. 2, page 1607.)

And yet, notwithstanding this practical manifestation of his actual incredulity, it appears that, upon the occasion of his visit to Washington in the succeeding February and March, Mr. Bell called upon Prof. Henry and explained to him all his inventions, and especially his plan for the electrical transmission of speech by the proposed "harp apparatus," and sought his advice, evidently in the hope that some additional light might be gained as to the necessary conditions under which a practical construction might be effected.

Although Prof. Henry's ready sympathy and encouragement were highly esteemed by Mr. Bell, his opinions as expressed, instead of clearing away the obstacles, appear rather to have intensified Mr. Bells' just appreciation of some of the difficulties which must be overcome to effect the embodiment of the principle in any practical working construction.

"While in Washington attending to this business, I called upon Prof. Henry and explained all my inventions to him. His appreciation encouraged me very much, and he pronounced my plan for the electrical production of articulate speech, the germ of a great invention.

"I recollect explaining to him the idea of an instrument with a number of armatures tuned to different pitches, which I have before described, and it was with reference to this apparatus that he made the above remark.

"We had some conversation about the mechanical power of stretched membranes. I can not recollect the details of it, but I remember that the effect of his remarks was rather discouraging as to my being able to obtain the results from a stretched membrane which I had hoped. I remember that the impression left upon my mind was, that each stretched membrane would have a rate of vibration peculiar to itself."

In a letter written at the time to his parents, Mr. Bell refers to this portion of the interview as follows (C. Vol. 1, page 126):

"I felt so much encouraged by his interest that I determined to ask his advice about the apparatus I have designed for the transmission of the human voice by telegraph. I explained the idea and said, 'What would you advise me to do, publish it and let others work it out, or attempt to solve the problem myself?' He said he thought it was the germ of a great invention, and advised me to work at it myself instead of publishing. I said that I recognized the fact that there were mechanical difficulties in the way that rendered the plan impracticable at the present time. I added that I felt that I had not the electrical knowledge necessary to overcome the difficulties. His laconic answer was, 'GET IT.'"

The entire letter is interesting and is as follows:

292 Essex St., Salem, March 18, 1875.

Dear Papa and Mamma:

I have just returned from my trip to New York thoroughly worn out. Found your letters of the 14th inst. awaiting me. I am now beginning to realize the cares and anxieties of being an inventor. In order to complete the apparatus (multiple telegraph, see Int. 60), as thoroughly as possible, I have decided to give up all professional work for some weeks. I have put off all pupils and classes until the 12th of April. Flesh and blood could not stand much longer such a strain as I have had upon me. Professional work is all in confusion, and the only way is to cut the Gordian knot, and throw up everything until the end is achieved. I long to write full accounts to you and I have delayed writing in order to give a connected narration of the whole. You seem to think that my anxieties are over, when in truth they are really only beginning.

Before entering upon explanations, let me ask you first to hunt over all my old letters that you have preserved, for everything bearing on the telegraph. Forward to me at once as evidence. I must take action at once in regard to foreign patents. Will you or uncle help me in this?

What I would like is this: I have written to my lawyers in Washington to make application for foreign patents on my own responsibility.

Should I prove unable to pay for these applications at once, will you help me? While these applications are being got out I shall write to the Herdmans, offering them a share if they will take the pecuniary burden of any interference, etc., that may arise abroad from Mr. Gray. Should they decline—which I should think unlikely—I should of course relinquish a foreign contest.

Whenever I am free to dispose of my interest in the invention I shall do so, and then you may expect to see visible speech go ahead. I can then take up the electro-motor which I think as valuable an idea as this telegraph.

Now to resume telegraphy. When I was in Washington I had a letter of introduction to Prof. Henry who is the Tyndall of America. I had found on inquiry at the Institute of Technology, that some of the points I had discovered in relation to the application of acoustics to telegraphy had been previously discovered by him. I thought I would therefore explain all the experiments and ascertain what was new and what was old. He listened with an unmoved countenance but with evident interest to all; but when I related an experiment that at first sight seems unimportant, I was startled at the sudden interest manifested.

I told him that on passing an intermittent current of electricity through an empty helix of insulated copper wire, a noise could be heard proceeding from the coil similar to that heard from the telephone. He started up, said, "Is that so? Will you allow me, Mr. Bell, to repeat your experiments and publish them to the world through the Smithsonian Institute, of course giving you the credit of the discoveries?"

I said it would give me extreme pleasure and added that I had apparatus in Washington and could show him the experiments myself at any time. He asked if I could do it then if he went with me, and I told him I had everything in readiness at Mr. Hubbard's house. He said, "I will go with you now. Have you a carriage here?" I had not, and so he put on his coat and was about to order his carriage, when I offered to save him the trouble of going out on such a raw damp day by bringing the apparatus to the Smithsonian Institute. (He was suffering from a cold and besides is very aged—I believe about eighty years old.)

We appointed noon, next day, for the experiment. I set the instrument working and he sat at a table for a long time with the empty coil of wire against his ear, listening to the sound. I felt so much encouraged by his interest that I determined to ask his advice about the apparatus I have designed for the transmission of the human voice by telegraph. I explained the idea and said, "What would you advise me to do; publish it and let others work it out, or attempt to solve the problem myself?" He said he thought it was the germ of a great invention, and advised me to work at it myself instead of publishing. I said that I recognized the fact that there were mechanical difficulties in the way that rendered the plan impracticable at the present time. I added that I felt I had not the electrical knowledge necessary to overcome the difficulties. His laconic answer was, "GET IT."

I can not tell you how much these two words have encouraged me. I live too much in an atmosphere of discouragement for scientific purposes. Good ——— is unfortunately one of the *cui bono* people, and is too much in the habit of looking at the dark side of things. Such a chimerical idea as telegraphing *vocal sounds* would indeed, to *most minds*, seem scarcely feasible enough to spend time in working over. I believe, however, that it is feasible and that I have got the cue to the solution of the problem.

Prof. Henry seemed to be much interested in what I told him, and cross-questioned me about my past life and specially wanted to know where I had studied physics.

Having left Prof. Henry and Washington, I proceeded to New York, where I saw Mr. Orton and Mr. Prescott, the electrician. Arrangements are made for me to bring my instruments to New York and experiment on real line wire.

I left Boston last Sunday and called at the office of the Western Union on Monday. Mr. Orton and Mr. Prescott both devoted a large portion of their time in discussing with me, the whole plan, from its theoretical point of view. Mr. Smith, the manager of the experimental room, was absent from town, but was telegraphed for. He replied that he could not come till next morning. Tuesday forenoon we had batteries connected and I tuned up my instruments. They went like clock work. I have come to the conclusion that, by a happy chance, they are much more perfect than I thought at first. The signals are as clear, sharp and rapid as with the ordinary Morse sounder. I connected two transmitters and two receivers on only one line, and two messages were sent simultaneously.

We had 100 cells of a battery and all went well on our artificial circuit. Mr. Prescott then said he would like to see them tried on a real line wire. He telegraphed to Philadelphia to have two wires crossed there so as to give us (practically) a continuous wire from New York to Philadelphia and back. The electro-magnets I employed were not intended for trial on a long line. They were wound with coarse wire and the "resistance" was only "3 ohms." Ordinary electro-magnets for actual service on a line have a resistance of about 200 to 600 ohms. None of us, therefore, expected the instruments to work without stronger magnets. But they *did work*. The signals, though feeble, came sharply and concisely through the 200 miles of line wire. I suggested trying stronger magnets, so Mr. Prescott ordered the instruments to be taken to the work shop, and stronger magnets placed on them. They were to be ready in the afternoon, so I went out to dinner and returned in a couple of hours.

Rest will form subject for next letter.

With fond love, your ever affectionate son,

ALECK.

Prof. A. M. BELL, Brantford, Ontario.

IX.

In the autumn of 1874, after his return from Canada, Mr. Bell entered into an arrangement with Mr. Gardiner, G. Hubbard and Mr. Sanders, whereby they became interested in his inventions and furnished the funds for the prosecution of experiments and obtaining the necessary patents.

Immediately thereafter, in connection with his professional pursuits, Mr. Bell devoted himself principally to the practical development of his system of multiple telegraphy, both in accordance with his original plans and in connection with the use of induction coils.

The particulars of this work appear in the record as follows:

"Cross-Q. 342. (C. Vol. 2, page 1600.) From the summer of 1874, till at least as late as June 2, 1875, your experimental work was confined almost, if not quite, exclusively to your multiple telegraph inventions, was it not? Ans. Yes, excepting so far as my professional experiments in teaching correct articulation to deaf mutes and persons with defective speech was concerned. During the early part of the period referred to my professional experiments occupied most of my time.

"Cross-Q. 343. Within the period I have mentioned in my last question how many patents did you take out or apply for in this country on inventions relating to multiple telegraphs; and will you state the particular subjects of said inventions, the dates when the applications were filed, and the dates when the patents were granted? Ans. 1. Application, February 25, 1875. Multiple telegraphy, circuit-breaking vibrators for transmitters and tuned reed receivers; patent not issued; in interference with Gray. 2. Application, March 6, 1875. Vibratory circuit-breaker and autograph telegraph. Patented as No. 161,709, April 6, 1875. 3. Application, March 10, 1875. Multiple telegraph circuit-breaking transmitters used with induction coils; in interference with Gray; patent not issued."

"Cross-Int. 225. (C. Vol I, page 188.) Did you practically try the arrangement which you so conceived in December, 1873, for inducing the intermittent current on the line wire? Ans. I did not at that time.

"Cross-Int. 226. At what time did you? Ans. I made numerous experiments with induction coils in the winter of 1874–75, but I can not be certain that the full arrangement of circuit shown in Fig. 4 was tried, but I believe it was. I at all events remember experimenting with a single induction coil, having an interrupter and receivers arranged as in Fig 4, and I remember changing the interrupter, substituting for it an interrupter of different rate of vibration. The point I am uncertain about, is as to whether a number of induction coils were used, as in Fig. 4. The arrangement shown in Fig. 5 was not tried. I can not fix the dates of these experiments otherwise than the winter of 1874–75. They might have been as early as the 1st of November, 1874."

"Cross-Int. 229. After the experiments were tried in the winter of 1874–75, which you have mentioned, what did you ever do with a view to the practical trial of the arrangement you had conceived for inducing the intermittent current on the line wire, or for any use of the induction coil between the interrupter and the receiver? Ans. I satisfied myself by practical experiment, that an induction coil could be practically used, but my difficulty was to get interrupters so tuned as not to interfere with one another's action. A great portion of my time from February, 1875, to June, 1875, was taken up in experiments to overcome this difficulty.

"Cross-Int. 230. With what result? Ans. The experiments led me to the discovery, made on the 2d of June, 1875, which has been described at length in my deposition."

The details of Mr. Bell's work upon his multiple telegraph system, during this period, are given with more particularity in his Preliminary Statement in Harmonic Interferences, as follows (C. Vol. IV Exhibits, page 987):

"At Mr. Hubbard's suggestion I decided not to file my caveat, but to have apparatus constructed as speedily as possible, so as to make application for a patent instead. Two transmitting instruments and receivers, like these shown in Fig. 18, were at once made, and were arranged upon circuit as in Fig. 19. The very first time they were tried they worked satisfactorily. When K^1 was depressed, R^1 alone was affected; when K^2 was depressed, R^2 alone

FIG. 16 (Summer of 1874)

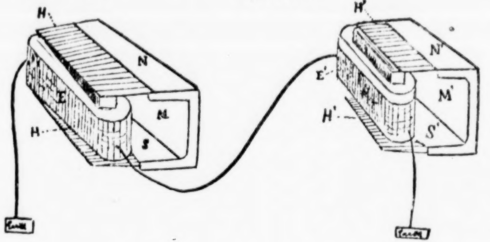
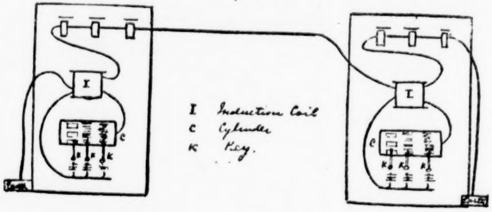
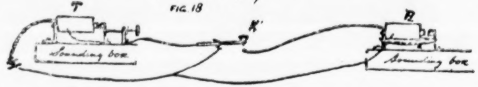

H
N
E
M
H
S
Earth
H'
N'
E'
M'
H'
S'
Earth

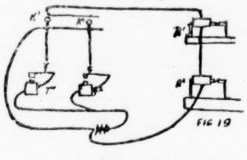
FIG. 17 (Summer of 1874)


I
C
K
I Induction Coil
C Cylinder
K Key.
Earth
Earth

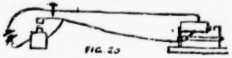
(October 1874) FIG. 18


T
Sounding box
K'
R
Sounding box

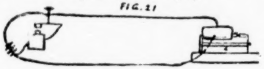
(October 1874) FIG 19



(Oct. or Nov. 1874) FIG. 20



(Oct. or Nov. 1874) FIG. 21



(Oct. or Nov. 1874) FIG. 22

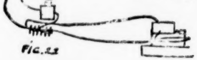


FIG. 23 (Oct. or Nov. 1874)

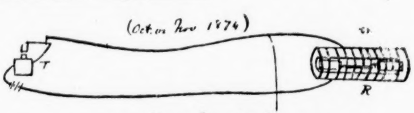
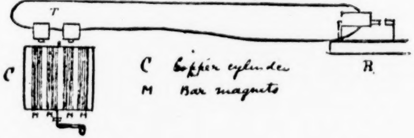


FIG. 24 (Oct. or Nov. 1874)


T
C
M M M M
C Copper cylinder
M Bar magnets
R

was affected. When K^1 and K^2 were depressed simultaneously, R^1 and R^2 both responded. The attempt to use the induced current with these instruments was unsuccessful. Not knowing fully the cause of the failure, it was decided to prepare the instruments that were successful for the purpose of securing the patent, and to leave the utilization of the induced current to be investigated at a later date.

"It is needless to detail the whole of my experiments. I shall seek only to point out the various stages of development.

"The pitch of each transmitting instrument changed the moment its key was depressed. The pitch varied with the length of the circuit. It was rendered independent of the resistance of the line by connections shown in Figs. 20, 21 and 22. The pitch was also affected by the strength of the battery.

"The spark in the transmitting instrument at the point where the circuit was broken, was lessened by the use of a condenser.

"The armature of the receiving instrument answered loudly to any pitch when it was placed in close contact with the face of its electro-magnet, but responded only to its proper pitch when it was placed about a quarter of an inch distant.

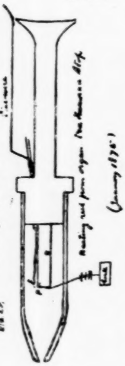
"A rubber band (d) attached to the armature, served as a damper (Figs. 20, 21 and 22) so as to stop the vibration of the receiver immediately on the cessation of the electrical impulses.

"One form of receiving instrument constructed at this time is shown at R, Fig. 23. A wrought-iron nail (n) was placed between two cylindrical pieces of iron (i) inside a helix of wire. A note of similar pitch to that produced by the transmitting instrument proceeded from R. The instrument was not, however, sensitive to one pitch alone, but reproduced very loudly the unison of whatever transmitter was employed. These experiments were made in November, 1874.

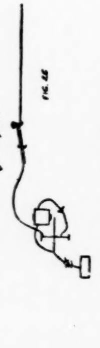
"An attempt was also made by means of bar-magnets arranged around a cylinder as in Fig. 24 to induce a current that would work the receiving instruments. The results were unsatisfactory. During the winter of 1874–75 it was attempted to use organ reeds (from the vox humana stop) as transmitting instruments. The mode of connection is shown in Fig. 25. The tongue (t) was insulated from the bed of the reed B by means of paper. The tongue (t) vibrated against a platinum plate P, making and breaking the circuit. The reeds soon got out of order, and were very liable to change in pitch, so that the electro-magnetic transmitters were preferred.

"In January, 1875, the thought occurred of rendering the pitch of the transmitting instrument independent of the strength of the battery, as well as of the resistance of the line, by causing the vibrating armature to strike alternately against two fixed points. One made contact for a local battery, the currents of which traversed the electro-magnet, and served to keep the armature in vibration. The other communicated with the main battery and the line wire, but not with the electro-magnet. The arrangement (see Fig. 26) proved so successful that I felt that the instrument was near

FIG 25



(Winter of 1874–5)



(January 1875)

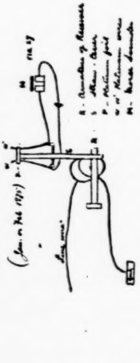
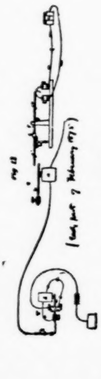


FIG 27
M
W W'
R
Line wire
R - Armature of Receiver
S - Straw - Lever
P - Platinum foil
W W' Platinum wires
M - Morse Sounder

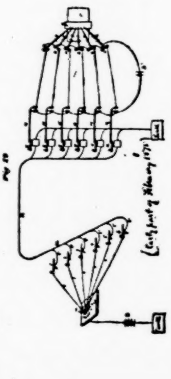
(Jan. or Feb 1875)

Fig 28

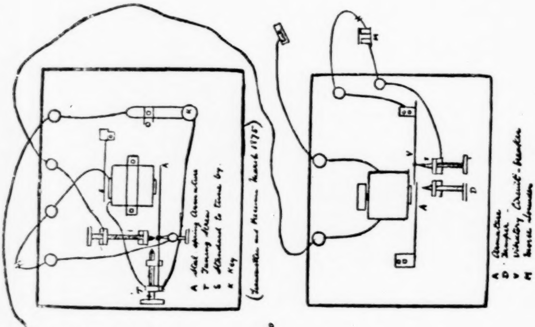


(Early part of February 1875)

Fig 29



(Early part of February 1875)


A Steel spring Armature
T Tuning Screw
S Standard to tune by.
K Key
T
A
K
A Armature
D Damper
V Vibratory Circuit-breaker
M Morse Sounder
A
V
D
M

(Transmitter and Receiver March 1875)

FIG 30

completion. I constructed armatures of various materials, but finally decided to use those made of clock-spring.

"Platinum connections could not be soldered on without spoiling the temper of the spring. Finally a small rivet of platinum was inserted in the spring where it came into contact with the fixed points. A sliding clamp was fastened to the armature of the receiving instruments for tuning it. The rubber damper was omitted, as the spring was allowed to strike the face of the magnet.

"It was next perceived that the armature of the receiving instrument would operate an ordinary Morse sounder, or any electro-magnetic machine, if it struck a body of slower vibration than itself, when the vibratory motion of the armature would be converted into permanent make or break of a local circuit. The first form of vibratory circuit breaker is shown in Fig. 27. A light lever of straw S was hung vertically in front of the receiver R, when the armature vibrated the platinum plate P into contact with the wires W W^1, completing a local circuit in which was placed a Morse sounder. The instrument was still further improved as in Fig. 28, in which form a patent was granted to me in February, 1875, No. 161,739. The oxidization of the mercury in the cups C C, Fig. 28, was prevented by covering it with glycerine.

"The autograph telegraph described in the specification of the same letters-patent was invented at the same time. See Fig. 29.

"During the early part of February, friends in Salem tested the instruments by sending two messages simultaneously over the same wire, by an alphabet of numbers arranged for the occasion. The words 'multiple telegraph' were sent by one instrument, and 'autograph telegraph' by another. Then the words 'Katie Silsbee,' 'Valentine,' and 'well done,' and at the same time the words 'multiple,' 'cat,' 'Lizzie' and 'lovely,' only one wire being used in both experiments.

"On another occasion four stations, A, B, C, D, were arranged on the same circuit; and among other messages the words, 'bravo, bravo, bravo,' were sent from A to D, while 'good tidings' were sent from B to C. These experiments were entirely successful.

"During this month, February, 1875, I visited Washington and retained Messrs. Pollock & Bailey as solicitors for my patents; and left my models of the transmitting instrument, receiving instrument and vibratory circuit-breaker with them. I met there Mr. Orton, the president of the Western Union Telegraph Company, who was much interested in my instruments and requested me to call upon him as I passed through New York on my way home, which I did.

"In conclusion I would say, that the invention, the subject-matter of the first interference between my application, dated February 25, 1875, and the application of P. La Cour, filed March 3, 1875, and of Elisha Gray, filed February 23, 1875, namely:

"'The method of transmitting two or more telegraphic signals or messages simultaneously along a single wire, and of receiving the same without confusion by the employment in an electric circuit of two or more transmitters, each transmitting per second impulses differing in number from the others in combination with receivers, each tuned to a pitch at which it will be put in vibration to produce its fundamental tone by one only of the transmitters,'—described by me in the first clause of my claim, and by Elisha Gray in his first, third, fifth and seventh claims, was invented by me prior to August, 1870, and reduced to practice on or about the first day of November, 1872. (See the above statement, p. 2.)

"The inventions, the subject-matter of the second interference between my application and that of Elisha Gray, namely:

"1st. The combination of a main line, an intermittent circuit-breaker adapted to throw upon the line a definite number of electrical impulses in a given time, and a key for controlling the throwing of such impulses upon the line, described in my second claim and Elisha Gray's second claim.

"2d. The combination in one electric circuit of a series of such intermittent circuit-breakers, and a series of such keys, there being a key for each intermittent circuit-breaker —were invented by me prior to August, 1870, and reduced to practice on or about the first day of November, 1872. (See the above statement, pp. 2 and 5.)

"The invention, the subject-matter of the interference between my patent, No. 161,739, and the application of Elisha Gray, filed February 23, 1875, and that of P. La Cour, filed March 3, 1875, namely, 'the combination with the portion of the receiver put into vibration by the musical impulses of a circuit-controlling lever or bar, arranged and adapted to vibrate more slowly than the former' described in my second and Elisha Gray's four claims, was invented by me in January, 1875, and reduced to practice on or about the 8th day of February, 1875. (See above statement, p. 16.)"

A. GRAHAM BELL,
Boston University, April 27, 1876.

It would appear from the foregoing statements that multiple telegraph instruments constructed and arranged upon the original plan had finally been perfected, and had passed successfully the ordeal of a practical test. But there still remained inherent in this plan the defect already pointed out by Mr. Bell (C. Vol. IV Exhibits, page 981), to wit, that under the existing conditions messages could be sent in only one direction, as free earth communication was possible at one end only of the line. If the currents, however, could be *induced* in any way upon the main circuit, free earth communication could be had at both ends of the line, and this defect would be obviated.

The application of any system of induction, however, involved serious practical difficulties, and the subject, therefore, seems to have received a degree of attention, so far as circumstances would permit, commensurate with its vital importance.

"The attempt to use the induced current with these instruments (made in the autumn of 1874) was unsuccessful. Not knowing fully the cause of the failure, it was decided to prepare the instruments that were successful for the purpose of securing the patent, and to leave the utilization of the induced current to be investigated at a later date."

The patent referred to was applied for "February 25, 1875," two days after the filing of Mr. Gray's application for the same invention, which was filed "February 23, 1875," thus affording a coincidence well calculated to intensify their rivalry.

Mr. Bell states the effect upon himself as follows: (C. Vol. 2, page 1602.)

"When these applications (Mr. Bell's) were filed in the patent office, I was soon thrown into interference with Mr. Elisha Gray, who had developed a somewhat similar system of multiple telegraphy. This circumstance threw me into a fever of excitement. I feared that I might lose the fruits of laborious researches carried on for years under great difficulties, and I therefore devoted every moment I could spare to the development of multiple telegraphy. Indeed, I devoted to this subject more time than I could spare, for it led to the subordination and partial neglect of my professional work, so that I was soon in such a position that I was not earning my support."

It appears, however, that the application of induction coils had been so far perfected by Mr. Bell that on March 10, 1875, he made application for a patent for "Multiple telegraph circuit-breaking transmitters used with induction coils;" that "after the experiments were tried in the winter of 1874 and 1875," or during that period, he satisfied himself by practical experiment that an induction coil could be practically used, but his difficulty was to get interrupters so tuned as not to interfere with one another's action; that a great portion of his time from February, 1875, to June, 1875, was taken up in experiments to overcome this difficulty, and that these experiments led him to the discovery of June 2d.

The record contains no recital or account of any practical test having been made with instruments provided with induction coils, as for example, by sending two messages simultaneously over the same wire, even in one direction, as had been done with his former instruments. It is perhaps a fair inference, however, from Mr. Bell's statements that he had at this time so far perfected the apparatus that, as far as the induction coils were concerned, it was capable of practical performance, so that by its use two messages could be transmitted simultaneously in both directions.

But however that may be, the incident which happened June 2, 1875, led him to believe that he had found an *alternative* method of inducing currents which possessed certain important advantages for the purposes of multiple telegraphy, as was subsequently set forth in his patent of March 7, 1876.

This is made clear by the context to the passage already quoted from his deposition as follows: (C. Vol. I, p. 189.)

"Cross-Int. 233. Did you at any time after that make any practical trials in reference to the use of an induction coil for inducing currents upon the line wire? Ans. I did, many.

"Cross-Int. 234. For what purpose and with what result? Ans. For the purposes of multiple telegraphy. I found that the currents induced in the secondary circuit of an induction coil by the action of an interrupter in the primary circuit occasioned a much more powerful vibration of the tuned reeds of my harmonic receivers than the magneto-electric currents I was then able to produce.

"Cross-Int. 235. Did you, in consequence of this observation, apply to practical use the induction coil with a secondary circuit? Ans. I did not. I kept it in view in experiments relating to multiple telegraphy, but I believed that the magneto-electric currents possessed many advantages for this purpose if the strength of the magneto currents could be increased, and that they could be used in addition for the transmission of articulate speech electrically; and I therefore devoted most of my time to ascertaining the conditions under which the most powerful magneto currents were produced."

X.

But all this time the subject of the possible solution of the problem of the electrical transmission of speech still remained under consideration. Mr. Bell says (C. Vol. 2, page 1603):

"During this period it must not be supposed that I had forgotten or neglected my ideas concerning the speaking telephone. Although, as stated above, I felt it my duty to devote all my spare time and thoughts to the development of multiple telegraphy, I could not help thinking and dreaming of the speaking telephone. It was constantly in my mind."

The subject had for him a peculiar fascination, and, although during this time it was kept in the background by the strenuous efforts he felt compelled to put forth to complete the multiple telegraph, it was by no means dismissed from his thought. The hope of a possible ultimate success, to be attained in some way and by some means, was evidently still cherished, and this very hope acted as a stimulus to his powers.

While the obstacles in the way of the practical development of the plan he had devised were so apparently insurmountable that, as we have seen, he did not attempt even so much as a single experiment to test any of the conditions involved, he was still thinking and dreaming over the subject and it was constantly in mind.

At length, some time in the spring of 1875, a new idea occurred to Mr. Bell, which he thought might possibly lead to the development of another plan for the electrical transmission of speech.

The circumstances are related in a letter written at the time by Mr. Bell to Mr. Hubbard, as follows (See Vol. I, page 129):

"SALEM, MASS., May 4, 1875.

"*Dear Mr. Hubbard:* * * * Letter received from Mr. Pope, with directions for preparing paper. Letter received from Prof. Henry of the Smithsonian Institute, in answer to one I wrote him some time ago, telling him of recent experiments undertaken in order to determine the cause of the sound heard from the empty helix of wire.

"The deduction I had made from the experiments was that an intermittent current of electricity creates a molecular vibration in the conductor through which it is passed. Prof. Henry writes that he believes that my experiments are new, and that my explanation of the cause of the sound is, in his opinion, correct.

"An experiment which I have long desired to make, is at last within my reach. My friend Don Manuel Fenollosa, whose music rooms are next door to this house, is to allow me to experiment with his pianos. I shall carry a wire from my study into his room to-morrow, and try the effect of passing an intermittent current through the strings of a piano. Unless I am greatly mistaken, the string, whose rate of movement coincides with the molecular vibration induced in the wires by one of my transmitters, will resound loudly.

"Another experiment has occurred to me which, if successful, will pave the way for still greater results than any yet obtained. The strings of a musical instrument in vibrating undergo great changes of *molecular tension*. In fact, the vibration represents the struggle between the tension of the string and the moving force impressed upon it. I have read somewhere that the resistance offered by a wire to the passage of an electrical current is affected by the *tension of the wire*. If this be so, a *continuous current of electricity* passed through a vibrating wire should meet with a varying resistance, and hence a pulsatory action should be induced in the current. If this turns out to be the case, the oscillations of the current should correspond in *amplitude*, as well as in the rate of movement to the vibrations of the string. One consequence would be that the *timbre* of a sound could be transmitted.

"The plan for transmitting *timbre*, that I explained to you before, viz., causing permanent magnets to *vibrate* in front of electro-magnets, is chiefly defective on account of the feebleness of the induced currents. If the other plan is successful, the strength of the current can be increased *ad libitum*, without destroying *the relative intensities of the vibrations*.

"Yours respectfully,
"A. GRAHAM BELL.

"GARDINER G. HUBBARD, Esq.,
"Cambridge, Mass."

It will be remembered that in the letter written by Mr. Bell to his parents March 18, 1875, regarding his interview with Prof. Henry, and already quoted at length, the following passage occurs:

> "I told him that on passing an intermittent current of electricity through an empty helix of insulated copper wire, a noise could be heard proceeding from the coil, similar to that heard from the telephone." (The Reis telephone; see Cross-Q. 526, C. Vol. II, page 1665.)

It appears, from this letter of May 4, 1875, that Mr. Bell afterward made some experiments, in order to determine, if possible, the cause of this sound, and that these experiments led him to the deduction that it was due to a molecular vibration set up in the coil by the passage through it of the intermittent current.

This was an able deduction and met the entire approval of Prof. Henry.

The observation of the fact that the passage of an intermittent current through a coil of wire produced from it a sound corresponding in pitch to that of the vibrating circuit breaker in the transmitter (see Bell's American Academy Paper, C. Vol. I, pages 69, 70) led Mr. Bell, then, to make the practical deduction that if the intermittent current thrown upon a circuit by the vibrating reed of a transmitter was passed through the metallic strings of a piano, that string whose pitch or normal rate of movement coincided with the rate of the molecular vibration induced in the wires by the transmitter, ought to resound loudly.

And, conversely, that if a particular string, in unison with the pitch of the reed in one of his electro-magnet receivers, was placed in circuit with it, with a continuous battery current (see Ans. 68, page 134), that upon sounding the piano string the receiving reed ought to respond audibly.

It was a beautiful scheme, and with characteristic enthusiasm Mr Bell announces that *if* the experiment proves successful, "it will pave the way for still greater results," and proceeds immediately to outline his proposed new plan for the transmission of speech, all based upon the ever recurring but intractable "*if*."

"If" the resistance offered by a wire to the passage of an electrical current is affected by the tension of the wire, as he had somewhere read, a continuous current of electricity passed through a vibrating wire should meet with a varying resistance, and hence, a pulsatory action should be induced in the current. "If" this be so, the oscillations of the current should correspond in amplitude as well as in rate of movement to the vibrations of the string, and in consequence the *timbre* of a sound could be transmitted. The chief defect inherent in his original plan was the apparent feebleness of the induced currents. "If" the other plan be successful, no such difficulty will be encountered, for the strength of the currents can be increased *ad libitum*, without destroying the relative intensities of the vibrations.

Fortunately, the fundamental principle upon which the whole fabric of this reasoning was based could be brought to a simple but conclusive test. Mr. Bell knew that sympathetic vibration was most easily effected between two bodies tuned exactly in unison, and that therefore, if his premises were correct and his conclusions were rightly drawn, the loud vibration of either of such bodies, when they were in the arranged manner described, would cause the other to audibly respond, with a sound of the same rate of vibration, and at least with some amplitude or loudness.

He made the decisive test and the result is related as follows (C. Vol. I, page 134):

"Int. 68. Did you try at Mr. Fenollosa's rooms the experiment proposed in your letter to Mr. Hubbard of May 4th, and if so with what results? Ans. I tried the experiments within a day or two of the letter to Mr. Hubbard. I first passed an intermittent current from a current interrupter through that string of a piano which seemed to be in unison with the interrupter, and observed whether the string was thrown into sympathetic vibration. It was not. I then listened very closely to the piano, for the purpose of ascertaining whether any noise proceeded from the wire. I heard the pitch of the interrupter, but whether the sound was transmitted through the air from the adjoining house, or proceeded from the string in question, I was not able to satisfy myself. A continuous current was then passed through one of the wires of the piano, and through the coils of an electro-magnet in the adjoining house. Over the pole of that electro-magnet projected the free end of a steel reed, which was tuned to the pitch of the string.

"The string of the piano was then set in vibration by depressing the proper key of the piano, and the effect upon the reed noted. The reed was not thrown sympathetically into vibration. Upon placing my ear against the steel reed, I could hear very faintly the tone of the string, but I was unable to satisfy myself whether the sound I heard was electrically produced or had been transmitted mechanically to my ear. The piano was in an adjoining house, and the sound was faintly audible in the room where I tried the experiment."

Mr. Watson, who assisted him in these experiments, also testified, as follows (*Ibid.*, page 201):

"Int. 8. Do you remember the experiment at Mr. Fenollosa's music rooms in May, 1875? If so, describe it. Ans. I do. We had a line run between Mr. Bell's laboratory in Salem and the music room in the next building. We arranged a current interrupter on the line in the laboratory and passed the intermittent current through the strings of a piano at the music room. I remained at the laboratory during the entire experiment. Mr. Bell was at the music room during the first part of the experiment but came to the laboratory afterward. He told me that he could not be sure whether he heard a musical note on the piano string or not. We then arranged a harmonic receiver on the line at the laboratory, and he directed some one at the music room to sound continuously one of the strings of the piano, while he listened at the receiving instrument. My impression is that the result of the second experiment was the same as the first. I do not think I was able to hear anything in the second experiment."

Mr. Bell also repeated his account upon cross-examination, as follows (C. Vol. 2, page 1610):

"Cross-Q. 362. Will you describe that experiment exactly as you made it? Ans. My recollection of the experiment is very vague. After reading my letter to Mr. Hubbard of May 4th, I remember distinctly that I did make an experiment on one of the pianos belon ing to the late Don Manuel Fenellosa. My recollection of the experiment, as it lies in my mind now, is substantially this: That two wires were carried from my study window into the adjoining building, where Mr. Fenellosa's pianos were. In my study was placed one of my tuned interrupters and a battery, and the two wires were attached one to each end of one of the strings of a piano; I presume that string that corresponded in pitch with the interrupter employed. I can only state my general recollection of the details of the arrangement. My expectation was, that if we could pass the intermittent current through the proper string it would be thrown into audible vibration. I have a general impression that we found all the strings metallically connected together, but that I thought the experiment was worthy of a trial, as it might be possible that the string that corresponds in pitch to the reed of the interrupter employed might be thrown sympathetically into vibration.

"Another experiment which I intended to try and may, perhaps, have tried, although I can not recall the details now, was to have connected together in the same metallic circuit one of the strings of the piano and one of my tuned receivers (a battery to be included in the circuit). I hoped that if the reed of the receiver had normally the same rate of vibration as the string of the piano, the reed might be thrown into sensible vibration when the proper key of the piano was struck. Now that I come to think of the experiment, I have a dim recollection of watching a tuned receiver of some kind in my study, so that I am more inclined to think that this experiment was also tried. At all events, whatever, the exact details were, I remember distinctly that *some* experiments in pursuance of the letter to Mr. Hubbard of May 4th, were made with Mr. Fenellosa's pianos. In regard to the results I am not so clear. My general impression is, that we either obtained no results or indifferent results, but I can not assert this positively. My impression also further is, that whatever results were obtained we thought the construction of the piano not suitable for the experiments, and I think the dfficulty was that the strings were metallically connected together. I can not pretend to be precise, and have done my best to give you my recollection of the experiment just in the vague manner it lies in my mind at present.

It thus appears that the experiments ended in an acknowledged failure. The ordeal of a practical test proved fatal to the scheme and we hear nothing more of it. Even the circumstances and the results of the experiments eventually passed into the oblivion of " very vague " and " dim " recollections and mere impressions.

But Mr. Bell still continued the study of electricity and magnetism, and found much to encourage him in the observation of the extraordinary power of the electric current to produce audible sounds, when passed either through iron wires, the plumbago of an ordinary lead pencil, or even through a thin strip of brass simply held to the ear so as to form a circuit through the body, and he therefore, by no means abandoned the hope of yet securing the electrical transmission of the human voice.

This faith is shadowed forth in a letter written to his parents May 24, 1875, as follows (C. Vol. 1, page 132):

SALEM, MASS., May 24, 1875.

" DEAR PAPA AND MAMMA:

I am so immersed in telegraphy and science that I find it impossible to write freely about anything else, but I feel that at the present time you can scarcely be inclined to listen to anything I have to say on such subjects.

" Since I gave up professional work and devoted myself exclusively to telegraphy, I have been steadily gaining health and strength, and am now in a fit state to encounter Mr. Gray or any one else.

"The patents that have been granted to me without opposition are—

" 1st. The principle of converting a vibratory motion into a permanent make or break of a local circuit.

" 2d. The special form of ' vibratory circuit breaker' put in illustration.

" 3d. The autograph telegraph.

"The autograph arrangement is rapidly approaching completion. Already I can copy handwriting *quite legibly*, though not yet neatly. The rate of transmission by means of my instrument will be exactly ten times more rapid than 'Bakewell's Autograph Telegraph,' in which the rate is 300 letters per minute. When 3,000 letters per minute can be sent, my telegraph will be the most rapid as well as the cheapest.

" Every moment of my time is devoted to study of electricity and to experiments. The subject broadens. I think that the transmission of the human voice is much more nearly at hand than I had supposed. However, this is to be kept in the background just now, as every effort is to be made to complete the autograph arrangement, so as to have it used on some line.

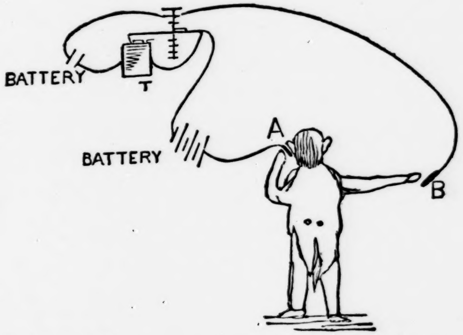
"The two patents for the transmission of musical notes are not decided yet. I can't understand why the interference should not have been declared before this.

"Here are some late discoveries: 1. The current from one of my instruments passed through an iron wire causes a musical note to issue from the wire. 2. The same effect is produced by passing the current through a piece of carbon. 3. Ditto when it is forced through the plumbago of an ordinary lead pencil ! ! ! No similar effects noted yet with copper, brass or mercury. A still more curious phenomenon is the following:

"Two thin strips of brass (A and B) are connected with the wires coming from my transmitting instrument, T, and from the battery. On holding A to my ear I hear nothing but the moment that I touched B with my finger a musical note is heard to proceed from A!!

"Truly, the more I study electricity and magnetism the more I feel the truth of Hamlet's saying, 'There are more things,' etc.

"I fear that this telegraphic business may force me to remain the greater portion of the summer here, but I can not tell yet, so many details have to be worked out. My inexperience in such matters is a great drawback. However, Morse conquered his electrical difficulties although he was only a painter, and I don't intend to give in either till all is completed. "With dear love, your affectionate son,



"ALECK."

Mr. Bell had also, during the preceding winter, observed another remarkable acoustical and electrical phenomenon, which he described in the following letter written to Dr. Blake (C. Vol. 4 Exhibits, page 967):

"SALEM, MASS., December 15, 1874.

"*My Dear Sir:* I have been unwell for some days past or I should have written to you.

"I have this afternoon made a curious discovery, if indeed further experiment confirms it, and I want your assistance in the matter.

"When we take hold of the handles of an ordinary electro-magnetic machine, the muscles of our arms are made to *vibrate* at a rate corresponding to the making and breaking of the primary circuit.

"Now, the thought struck me that if we could make the direct and inversed induced impulses succeed one another as regularly as the crests and depressions of waves, then an electrode applied to the ear so as to induce a vibration in the membrane tymp., *should create the sensation of sound without the aid of any intermediate apparatus.*

"I have had an instrument made, and the experiment seems a success.

"A number of permanent magnets were arranged upon a cylinder (see illustration) which was revolved in front of electro-magnets.

"On filling my ears with water and applying the wires (protected of course) as in the diagram, a soft musical note was heard.

"The sound stopped the moment the electrical circuit was broken.

"The wires employed were very short, so that the noise of the rotating cylinder (conducted mechanically along the wire) almost drowned the musical note. The latter thus appeared like an *overtone.*

"Two ladies who were present submitted to the experiment, and heard the note as clearly as I did. A gentleman, however, (who could not distinguish overtones in music,) heard nothing more than the *noise.*

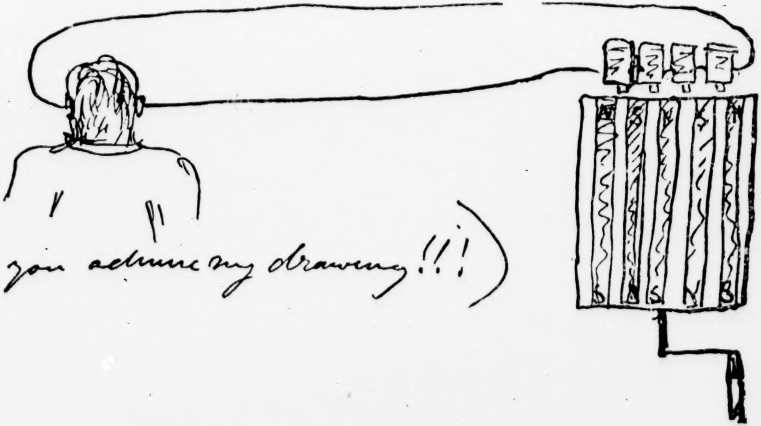
"I want your co-operation. Can we arrange for a meeting on Saturday morning at your rooms?

"I am anxious to see the results of your experiments.

"Yours sincerely,

"A. GRAHAM BELL.

"DR. C. J. BLAKE,
"Hotel Berkeley."



(I hope you admire my drawing!!!)

XI.

THIRD PERIOD.

We now come to the third period in the history of the development of Mr. Bell's invention, a period characterized by his labors toward the practical application of directly induced currents of electricity to the purposes of multiple telegraphy, and in addition, to the transmission of articulate speech.

Mr. Bell's efforts were turned in this direction by a discovery made by him June 2, 1875, as mentioned in the following letter written by him to Mr. Hubbard (C. Vol. I, page 136):

"SALEM, MASS., June 2, 1875.

"*Dear Mr. Hubbard:*

"I have accidentally made a discovery of the very greatest importance in regard to the transmitting instruments. Indeed, so important does it seem to me, that I have written to the organ factory to delay the completion of the reed arrangement until I have had the opportunity of consulting you.

"I have succeeded to-day in transmitting signals without *any battery whatever*.

"The musical note produced at the receiving end was sensibly the equivalent of that at the transmitting end in *loudness* as well as pitch.

"I shall call upon you to-morrow (Wednesday) evening, as there are several matters I wish to talk over with you. In haste. Yours, respectfully,

"A. GRAHAM BELL.

"GARDINER G. HUBBARD, Esq., Battle street, Cambridge."

The incident is related as follows (C. I, page 136):

"Int. 71. Did you on the 2d of June, 1875, perform the experiment stated in that letter? And if so, state where, and describe the experiment fully.

"Ans. I did. The experiment was made in the upper part of Mr. Williams' building, No. 109 Court street, in two small rooms that Mr. Williams had allowed me to use for experimental purposes.

"I was carrying on a series of experiments for the purpose of perfecting for practical use my system of autograph telegraphy which was a development of my harmonic telegraph. I had arranged three experimental stations upon a single line wire, which, for convenience of reference, I shall designate A, B and C. At station A were arranged a number of current interrupters whose rates of vibration were different, and a number of telegraph keys corresponding to the interrupters. By the depression of any key the intermittent current from the corresponding interrupter was directed on to the line wire to the stations B and C. At each station, B and C, were placed harmonic receivers corresponding in pitch to the interrupters at station A. Each receiver consisted of a horseshoe electro-magnet, to one pole of which was clamped one end of a steel reed, the free end of which projected over the other pole of the magnet. A coil of insulated wire surrounded that leg of the magnet which was presented to the free end of the reed. Stations A and B were in one room and station C in the adjoining room.

"I took charge of stations A and B during the experiment referred to, and Mr. Thomas A. Watson took charge of station C. We were making an experiment to ascertain whether the receiving reeds were properly tuned to their corresponding interrupters, and whether the operation of one interrupter interfered with that of the others when the keys were simultaneously depressed. I pressed down one key at station A and observed whether the proper reed at station B was thrown into forcible vibration, and Mr. Watson observed whether the proper reed of station C was similarly affected.

"Upon trying all the keys in succession, it was found that one of the receivers at station C failed to respond. As we very often found that the magnets of the receivers were so closely adjusted to the reeds that the reeds would stick to the pole when a powerful current was passed, I thought that this might be the cause of the failure in the present case. I therefore called out to Mr. Watson to pluck the reed with his finger. He did so, and I imagined the corresponding reed of station B was thrown momentarily into vibration. I was struck by this, as I had not depressed the key of the corresponding interrupter, and could not see where the current came from to operate that receiver. I therefore requested Mr. Watson to pluck the reed at station C a number of times, and found that I had not been mistaken in my observation. To test the matter still further I removed station A from the circuit altogether, and connected the receivers of B and C upon a closed circuit without any battery. Upon plucking with the finger any reed of station C, it was found that the corresponding reed of station B was thrown into sympathetical vibration and *vice versa*. I then requested Mr. Watson to pluck one of the reeds of station C a number of times, while I placed my ear against all the reeds of station B in succession. I could hear from each reed the peculiar tone of the reed plucked at station C, and recognized that the *timbre* of the plucked reed had been reproduced. We then placed a single receiver at station C in circuit with a single receiver at station B, and repeated the experiments. The results were much more marked. Upon plucking the reed at station C, its sound was reproduced by that at station B; and upon plucking the reed at station B, its sound was reproduced by that at station C. When the two reeds employed were in unison with one another, the plucking of one resulted in the visible vibration of the other, the amplitude of vibration often being considerable. No battery was used. Upon placing a battery in the circuit, the same effects were observed and the results were more marked."

The *discovery* thus made is first stated by Mr. Bell in his Preliminary Statement in Speaking Telephone Interferences in 1878, as follows: (C. Vol. IV., Exhibits, page 1007.)

"At once, my speculations in Canada, in the summer of 1874, occurred to my mind, and I saw that I had been hasty in coming to the conclusion that the magneto-electric currents, induced by the vibration of a plate or spring, would be too feeble to set corresponding armatures in vibration so as to produce audible effects; for in the experiment I had just made, the residual magnetism of the armature and core of the electro-magnet, though it must have been exceedingly slight, was able, when the spring was thrown into vibration, to induce a current sufficiently strong to set the armature of the other instrument in the circuit into visible vibration so as to produce audible effects.

"It will be noticed that the apparatus I have just described, is essentially the same as that represented in Fig. 5 of the drawings annexed to the patent granted to me March 7, 1876, and numbered 174,465, which is the subject of this interference, excepting that a battery is included in the circuit in the drawing, to give a greater amount of magnetism in the core of the electro-magnet. I did, in fact, on the second day of June, 1875, repeat these experiments with a battery included in the circuit, and then completed so much of the invention embraced in that patent as is represented in said Fig. 5.

"My mind immediately recurred to the use of a membrane as a means of operating an armature so as to correspond with the vibrations of the air caused by vocal sounds; and either on the same day, or shortly after, I gave orders for the construction of two instruments in which the armature of an electro-magnet should be moved by the vibrations of a stretched membrane, to which it was connected. Such an instrument was constructed by Mr. Watson during the month of June, 1875, but I am unable to fix the exact day."

In his deposition in the *Dowd* case in 1879, it is stated as follows: (C. Vol. I, page 139.)

"Ans. 74. The experiments made on the 2d of June, 1875, referred to above, solved the difficulty that had been in my mind since the summer of 1874, in regard to the practical operation of the various instruments I had devised for the reproduction of vocal utterance by electrical means. I had had the idea that magneto-electric currents generated by the vibration of permanent magnets, as reeds would be too feeble to produce any useful practical results. But the experiments above described, assured me that I had been mistaken in this idea, and I immediately upon this same 2d of June, 1875, gave instructions to Mr. Watson to have my membrane arrangement constructed."

And upon cross-examination at that time as follows: (Ibid. page 189.)

"Cross-Int. 231. Please, now briefly describe that discovery again. Ans. The discovery was that the magneto-electric current produced by the vibration of a steel reed or of a permanent magnet, in front of an electro-magnet, was sufficiently powerful to be utilized for the production of sounds by electric means."

And upon the cross-examination in 1883, as follows: (C. Vol. 2, page 1590.)

"Ans. 317. *The Discovery.* The discovery, therefore, that was made on the 2d of June, 1875, was that the vibrations caused in the armature of a receiving instrument by electrical undulations occasioned by the vibration of the armature of another instrument in the same circuit as the first, would be of very considerable force. As I have already explained, I had had the idea since the summer of 1874, that vibrations produced in this way would be of very slight amplitude, and that they might not prove sufficiently violent to produce audible effects, that would prove practically useful either for the purpose of the reproduction of articulate speech, or for the purposes of multiple telegraphy.

"The experiments described above convinced me that this was a mistake. The vibrations produced in tuned reeds were so great in amplitude that I felt sure that they were even sufficiently great to be mechanically utilized in my system of multiple telegraphy. Even when the reeds of the two instruments connected in circuit as shown in Fig. 5 of my patent of March 7, 1876, (but without a battery) were not in tune with one another, that is, did not have the same normal rate of vibration, the feeble forced vibrations electrically produced in the one by the mechanical plucking of the other, though barely sufficient to produce a visible motion, were quite sufficient to cause a very perceptible sound. I placed my ear against the reed of one of the instruments, while Mr. Watson plucked the reed of the other, and distinctly heard a musical tone at every pluck, the pitch of which was not that normally produced by the instrument at my ear, but was the pitch of the other which had been plucked by Mr. Watson. In this experiment also, the effects were perfectly well produced without any battery upon the circuit, and without any other source of permanent magnetism, than the feeble charge in the thin steel spring armature that would probably be caused by previous experiments with batteries, or the residual magnetism of the soft iron cores due to the same experiments.

"These results, therefore, satisfied me that I had very much underrated the power of undulatory electrical currents produced by the vibration of an armature to produce audible sonorous effects, and convinced me in a moment that the speaking telephone I had devised in the summer of 1874, would, if constructed, prove a practically operative instrument."

Thus by a happy accident, which might have escaped the notice of a less attentive observer, Mr. Bell was led to the discovery that he had all along been "hasty" and "mistaken" in coming to his previous conclusions; that he had "very much underrated the power" of these induced electrical currents; and, on the other hand, and possibly put in its mere positive aspect, "that the magneto-electric current produced by the vibration of a steel reed or of a permanent magnet, in front of an electric-magnet, was sufficiently powerful to be utilized for the production of sounds by electric means."

This undoubtedly came to Mr. Bell as with the force of a revelation, and seemingly brought within the range of actual possibility plans and methods of operating by induction which he had hitherto regarded as wholly impracticable except in theory.

And, first, as regards the application of this magneto-electric current to multiple telegraph purposes, it would enable him to operate his instruments upon a closed circuit and with free earth communication at both ends of the line, thus securing the transmission of messages singly or simultaneously in both directions. Moreover, from the peculiar nature of the current employed, he would be greatly relieved from the difficulty, encountered in the use of induction coils with circuit-breakers, of getting "interrupters so tuned as not to interfere with one anothers action;" and accordingly a much larger number of messages could be transmitted simultaneously on the same circuit.

Mr. Bell, in his intense rivalry with Mr. Gray at this period, undoubtedly appreciated these and the other advantages that would result from the application of directly induced currents to a system of multiple telegraphy. While orally, in the record, he is, as perhaps would be expected, somewhat reticent upon the subject, the documentary evidence introduced shows clearly that during the month of June at least, if not in July as well, he devoted considerable time and attention to the practical development of instruments provided with tuned reeds to be mechanically vibrated for this purpose.

Of the four letters subsequently written by Mr. Bell to Mr. Hubbard, during the months of June, July and August, 1875, and which are produced in evidence, two of them refer to this subject, while the other two refer to the transmission of vocal sounds. The two letters first above referred to are as follows: (C. Vol. 1, pages 141 and 146.)

"SALEM, MASS., June 28, 1875.

"*Dear Mr. Hubbard:*

"Mr. Hutchins (the organ builder) kindly devoted the whole of this afternoon to the construction of a steel reed for me.

"One of the latest receiving instruments was inclosed in a wooden box, and had its armature so arranged as to be set in vibration by a current of air passed through the box. The instrument was completed this evening in time for trial. Mr. Hutchins operated the reed in a little room up stairs (Williams' office), while I observed the effect upon a receiving instrument placed in the basement of the building. The sound was so perceptible that I found it unnecessary to place my ear against the instrument. The vibration of the armature could also be seen and felt.

"No battery or permanent magnet was used.

"I feel sure that a study of Ladd's or Wilde's magno-electric machine will reveal a means of increasing the intensity of the induced currents. I am told that Prof. Lovering has one of Wilde's instruments in his possession, so I shall call upon him to-morrow for information concerning it.

"Prof. Pickering has left town for the summer. I propose having the steel reed still further altered tomorrow, so shall probably be at the organ factory (Hutchins, Plaisted & Co., Cambridge street, near Charles street) most of the afternoon instead of at Williams,' shall call in the evening and report progress.

"Yours respectfully,

"A. GRAHAM BELL.

"GARDINER HUBBARD,

"Brattle Street, Cambridge:

"P. S. The experiment referred to above was repeated when a single cell of a battery had been placed in the circuit. The amplitude of vibration of the armature downstairs was quite large enough to work the vibratory circuit-breaker. We were unable to try higher battery power on account of the sticking of the generating armature. When the instrument is altered tomorrow I shall try higher battery power and test the resistance through which the current will pass.

"A. G. B.

"SALEM, MASS., Wednesday, July 7, 1875,

"*Dear Mr. Hubbard*:

"I forgot to mention this evening the gratifying results obtained with the steel reed.

(Cut.)

"When three cells of a battery were introduced into the circuit (as shown in the figure), the armature of the receiving instrument vibrated with considerable amplitude.

"When a damper was adjusted for it to strike against, the sound could be heard at a distance from the instrument.

"The helix at transmitting end had a resistance of about two ohms, and yet the vibration of the armature of the receiving instrument could be detected when a resistance of 100 ohms was introduced into the circuit. This seems to me to indicate more power than possibly be due to magno-electric currents, generated by vibration of the reed.

"May not a pulsatory action be induced in the *voltaic current itself* by the motion of the reed? I can imagine the current alternately weakened and strengthened according to the distance of the armature from the pole underneath.

"In this case the pulsations would certainly be available for our purpose, by merely increasing the battery power sufficiently to overcome the resistance of the line. Magno-electric currents are, however, evidently present, for a sound is perceptible at the receiving end when the battery is omitted altogether.*

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* In regard to the use of a battery in connection with the induced magneto-electric current, Mr. Bell has repeatedly expressed his views.

In his London lecture (C. Vol. 4, page 903) he said:

"The new form of instrument is that shown in Fig. 27, and, as had long been anticipated, it was proved that the only use of the battery was to magnetize the iron core of the magnet, for the effects were equally audible when the battery was omitted and a rod of magnetized steel substituted for the iron core of the magnet."

In his Preliminary Statement, in Speaking Telephone Interferences (C. Vol. 4, page 1007), he said:

"It will be noticed that the apparatus I have just described is essentially the same as that represented in Fig. 5 of the drawings annexed to the patent granted to me March 7, 1876, and numbered 174,465, which is the subject of this interference, excepting that a battery is included in the circuit in the drawing, to give a greater amount of magnetism in the core of the electro-magnet."

"Ans. 147. My original idea, in the summer of 1874, was to transmit sounds by means of magneto-electro currents without a battery; and from the time of the first conception of the speaking telephone, I had the belief that the apparatus could be operated by substituting a permanent magnet for the soft iron core of the electro-magnet.

"Int. 148. Then why did you use a battery with your speaking telephone?

"I think also that the effects are in some way dependent upon the peculiar form of electro-magnet employed. I hope to get some light on the subject from Moncel. He devotes several pages to the discussion of peculiarities observed in the one-legged or 'lame' magnet (boiteux) shown in his work as follows:

(Cut.)

"He says: 'Ce genre d'electro-aimant, que j'ai beaucoup étudié et le premier employé dans les applications électriques, a beaucoup d'avantages dont nous parlerons plus tard, et une force beaucoup plus considerable qu'on ne semblerait le croire à première vue ——,

With kind regards,
Yours respectfully,
A. GRAHAM BELL.

GARDINER HUBBARD, ESQ.,
Brattle street, Cambridge."

In C. Vol. IV Exhibits, pages 973 to 976, there appears as an exhibit "Bell's Memorandum of Experiments of June 30, 1875," which also relate directly to the subject of multiple telegraphy.

Mr. Bell testifies regarding the experiment referred to in the above letter of June 28th, relating to the instrument

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Ans. Because the effects obtained were much more powerful with a battery than without; and because I had the idea that in operating the instruments through any considerable resistance, as upon a real telegraph line, the battery would produce the most practically useful results." (C. Vol. 1, page 165.)

Complainants' expert, Mr. Charles R. Cross, testified as follows (C. Vol. 1, page 33, Ans. 12):

"The magnets *b* and *f* in Fig. 7 are electro-magnets having soft iron cores, which cores are magnetic only when a current of electricity is passing through the coils surrounding them. The object of the battery shown in Fig. 7 is simply to produce this current, which shall cause the cores to be kept magnetized."

And again (Ans. 20 Ibid, page 40):

"They do not, since the function of the battery represented in Fig. 7 of Mr. Bell's specification is merely to keep the cores of the electro-magnets magnetic. When permanent magnets are employed the permanent magnetism of such magnets is substituted for the magnetization produced by the battery current."

Mr. Bell's idea appeared to be that the magneto-electric currents were present on the line and did the work, for the sound was perceptible when the battery was omitted altogether. He would merely increase the battery power sufficiently to overcome the resistance of the line and leave the magneto-impulses flowing alternately in opposite directions free course upon the wire, to accomplish their work.

which "had its armature so arranged as to be set in vibration by a current of air passed through the box," and upon the subject in general, as follows (C. Vol. I, page 142):

"Int. 80. Did you, before writing that letter, perform the experiments therein described with the results therein stated? Ans. I did.

"Int. 81. The letter speaks of the production of sound when no battery and no permanent magnet was used; what generated the electric current or impulse in that case? Ans. The vibration of the armature acting upon the residual magnetism of the electro-magnet and armature. The instrument had been previously used in connection with a battery, and the core of the electro-magnet and the armature retained a slight magnetic condition.

"Int. 82. During the month of June, 1875, and before the construction and use of the second membrane telephone, did you try any experiments in which electric currents were generated or effected by the vibration of a reed in front of an electro magnet: and if so, to what extent and for what purpose? Ans. I was constantly occupied during the month of June, 1875, in experimenting to ascertain the best arrangement of coil, magnet and armature for generating electric currents in the manner indicated."

The outcome or result of these experiments, especially in the development of the novel theory of the simultaneous transmission of a large number of telegraphic signals without their interference, because of the undulatory character of the current thus employed, and of its consequent peculiar capacity in this respect, is a subject upon which little or no additional light can be obtained in the record.

This whole matter, however, was so clearly set forth by Mr. Bell in the specification of the patent subsequently applied for, and with such fullness of detail and elaborate explanation, that any further discussion of the subject possibly seemed wholly unnecessary.

XII.

But although Mr. Bell thus developed to the fullest extent the discovery of June 2, 1875, in its bearing upon his system of multiple telegraphy, it had for him a far deeper and more important significance. It revealed to him the starting fact that he had all along been laboring under a gross error in regarding the supposed feebleness of the induced electric currents as the one *insuperable* obstacle to their practical application to the transmission of speech.

At once his original theory, beautiful in its conception and perfect in the logical sequence of its reasoning, and over which he had been "thinking and dreaming" all the year, was vivified and quickened into vitality, as by a flash, by being thus suddenly brought within the range of possibility and of actual realization.

The other difficulties, though great, could not be regarded as insuperable, and we can readily imagine his enthusiasm, when, animated by his new faith, he realized that the time had now come when the "thought" and the "dream" must give place to *action*, and when, accordingly, for the first time in his life, he addressed himself to actual experimental work, in the effort to accomplish the practical development of his theory.

There was work to be done, and work calling for the exercise of the utmost ingenuity and calling into play the very highest powers of practical invention.

The fact he had observed was simply this: that when two or more of his electro-magnet receivers were placed in a closed circuit, with or without a battery, and the armature reed of one of the receivers was thrown *mechanically* into vibration, the induced currents were sufficiently powerful to throw that reed of a receiver which was tuned in unison, into visible vibration, while by placing the ear close to each of the receiving reeds a tone could be heard corresponding to the tone of the "plucked" reed.

This was just the instrumentality he required for the purposes of multiple telegraphy, while obviously it fell far short of meeting the requirements of a speaking telephone.

The clamped reed of the transmitter, tuned to a definite pitch, could only transmit a musical note of the same pitch, and it could only do this when it was set into vibration by the direct application of an appreciable mechanical force. But on the other hand, a speaking telephone must be able to transmit the whole range of musical tones and consonant sounds as well, together with the inflections and modulations of the voice, in a word, all the qualities of articulate speech. This must be done, too, without the direct application of any considerable mechanical force, and simply by the power of the human voice transmitted through the air.

Mr. Bell was, therefore, still confronted by the identical practical problem, with the perplexities of which, as we have seen, he had all along been contending theoretically. How was he to combine and arrange appropriate instrumentalities so that, on the one hand, the armature should be provided with a considerable surface, so as to receive the utmost possible motive force from the impact of the air particles, and at the same time make the arrangement so light and delicate that the slight force of the air would readily overpower the latent force tending to compel a vibration only at a definite normal rate, and so accurately sensitive that it would instantly respond, not only to the simple vibrations of the air particles, but to the almost infinite variations occurring in every part of each vibration. All this was requisite, as otherwise, and without this arrangement, the *quality* of speech could not be transmitted.

While, on the other hand, and in very antithesis to the foregoing essential conditions, the arrangement must necessarily be provided with, and carry through every variation of its movement, a body of inductive metal of sufficient size and weight to induce, by its motion in front of an electro-magnet, electrical impulses of such power as to force the receiving armature into vibrations audible to the ear, in an appreciable reproduction of the original speech. Otherwise, even if the first mentioned conditions were fulfilled, the apparatus would possess only a scientific interest in illustration of a beautiful theory, while it would be practically worthless as a telephone.

The knowledge that Mr. Bell had newly acquired was very valuable. He had learned the fact that a steel reed, by the direct application of an appreciable mechanical force, could be vibrated with sufficient inductive power to produce magneto-electric currents strong enough, operating through an electro-magnet in the receiver, to set its armature into audible vibration.

This was, however, by no means, a knowledge that there was sufficient power and motive force in the human voice, transmitted through the air, to reproduce speech in like manner. Nor, much less, was it a knowledge of the requisite arrangement of instrumentalities which would enable the voice to do this work.

But, on the other hand, the knowledge Mr. Bell had gained undoubtedly revealed to him, then and there, that it was not an *impossibility* that there might be such power in the human voice, and further, that means might possibly be so combined and arranged as to effectually utilize this power in the actual transmission of speech electrically. Mr. Bell unquestionally felt that at last he held within his grasp possibilities capable of extraordinary development; and *faith*, coming to his aid, supplied the place of knowledge, and inspired within him the conviction that this magneto-electric current, generated by the vibration of the armature of an electro-magnet in front of one of its poles, was indeed the very key to the ultimate solution of the great problem of the electrical transmission of speech.

And in this faith he applied himself earnestly to the difficult task of constructing an apparatus which, by its actual fulfillment of all the onerous conditions of the problem, should form a practical embodiment of his great principle in a working speaking telephone.

He, of course, soon found that the inherent difficulties of the task were greatly enhanced by the fact that he was entering upon the domain of what was practically an entirely new "art," without any accepted standards and without any technical lore, and where, indeed, there could be absolutely none "skilled in the art" to whom he could apply for aid. He was pushing out into a *terra incognita*, where he must himself develop every necessary expedient, and arrange instrumentalities in combinations so novel that he must for himself discover and apply all those underlying laws and principles through the application of which only could the combinations be made effective for his purpose.

So far as knowledge was concerned, Mr. Bell was admirably equipped for the work.

While he modestly did not profess to be a skilled electrician, Mr. Bell, while yet in England in 1867, "took up seriously the study of electricity," and for eight years thereafter, he had continued its special study and investigation, both by way of research and by practical experiment. His long and patient labors toward the development of his system of multiple telegraphy which operated upon the essential principle of the electrical production of sounds of a specific character in a magneto receiver, together with his special research into the phenomenon of the production of sound by the passage of a current of electricity through iron, steel, mercury and other substances, placed at his command a special knowledge rarely equalled. His labors in the study and the application of methods of electrical *induction* to the purposes of multiple telegraphy, by the use of induction coils, revolving bar magnet cylinders &c., and, in particular, the knowledge gained by the experiments of June second, in the production of sound by means of directly induced magneto-electric currents, undoubtedly carried Mr. Bell even beyond the boundaries of what was previously known in the science, at least so far as it related to the application of induced currents of electricity to the transmission of sound.

In the science of acoustics, the study of a lifetime in the line of his professional labors, and, especially, the close attention he had paid to the great work of Helmholtz, together with his subsequent researches with the phonautograph, had made him confessedly master of the subject.

As regards his knowledge of the nature of the difficulties to be encountered, and of the conditions which must be fulfilled to insure success, his reported conversations with Prof. Henry and with Dr. Blake, and his long continued theoretical study of the subject indicate unmistakably that he was not deficient in this respect.

As regards a knowledge of the available motive force contained in articulate sounds transmitted through the air, and of the mechanical effects that might be produced by the application of this force to a diaphragm, and of practicable methods of effecting this application, very little could be known by anyone at that time. As Mr. Pope has well said in the passage already quoted from his deposition:

"Very little was known at that date as to the actual mechanical effects which were capable of being produced by the sonorous atmospheric vibrations accompanying the production of ordinary sounds, such for example, as those produced by the human voice. Perhaps the only application of this force to produce an appreciable result, which was at all well known at that date, was the phonautograph, so-called, in which the vibrations of a membrane, produced by sound waves, were made to move a bristle over a surface of smoked glass through a very small range of vibration. The power required to effect this was inconsiderable in amount." (C. Vol. 2, 1293.)

But the little that was to be known upon this subject Mr. Bell had long before acquired, and had then made it peculiarly his own possession by actual practice and repeated experiments.

This is set forth at length in his deposition, as follows (C. Vol. 1, page 114):

"Int. 23. When, if ever, did you become familiar with the Scott phonautograph, referred to in Prof. Cross' twenty-eighth answer, page 395?

"Ans. In the winter of 1873-4.

"Int. 24. Did you, during that winter, construct any phonautographs yourself?

"Ans. I did; early in 1874.

"Int. 25. In those that you constructed, how was the rod which carried the style attached to the phonautograph frame, and how was it moved by the membrane?

"Ans. One end of the rod was hinged by means of a piece of leather to the edge of the circular frame carrying the membrane. A small piece of cork was fastened to the center of the membrane and to the rod. Upon uttering a sound in the neighborhood of the membrane it was caused to vibrate, and force the rod to vibrate also. The free end of the rod projected considerably beyond the opposite edge of the membrane, and its vibrations were recorded on smoked glass.

"Int. 26. Did you use in your phonautographs a paraboloidal mirror to concentrate the sound waves between the speaker and the membrane; if not, what form did you give to that part of the apparatus which conducted the sound waves from the mouth of the speaker to the membrane?

Ans. I did not use the paraboloidal mirror excepting in experiments with Prof. Cross, at the Institute of Technology, with the instrument he has described in his deposition. In all the phonautographs constructed by myself in the early part of 1874, I used a rubber tube, with a mouthpiece similar to those employed in speaking tubes.

"Int. 27. Whether or not during that winter you devised any apparatus for reproducing, by means of phonautograph sound tracings, sounds similar to those which had made the tracings; and if so, describe what it was and how it was to operate? Ans. I did. A phonautograph tracing was to be drawn on a hollow metallic cylinder, so arranged as to be capable of rotating on a vertical axis. The tracing was then to be cut so as to form a sinuous slit, and air was to be blown through the tracing from a pipe whose nozzle was contracted to a vertical slit. A pencil of air would thus be expelled at the points of intersection, and the rotation of the cylinder would cause this pencil of air to vibrate in the same manner as the air had been moved by the voice of the speaker when the original tracing had been made. I presumed, therefore, that the rotation of the cylinder would cause a sound to be heard similar in quality to that which had produced the tracing.

"Int. 28. Did you construct such an apparatus at any time? Ans. I did not.

"Int. 29. Did you, during the year 1874, use any phonautograph of an entirely different character from those which you have described, and if so, what was it? A. I used during the year 1874 a phonautograph which was made from a human ear. The middle ear was exposed by dissection, and a style of hay was attached to the end of the *incus* in place of the *stapes*. Upon uttering sounds into the external ear, I found that the hay attached to the *incus* vibrated sufficiently to enable me to obtain tracings of vocal sounds upon smoked glass."

"Int. 40. What experience had you had in vibrating, by means of the human voice, membranes which were so loaded or arranged that some work had to be done by the sound waves besides moving the membrane itself? A. I had made many experiments with phonautographs in which membranes operated by the human voice had not only moved levers of considerable length, at a mechanical disadvantage, but had caused such levers to perform considerable mechanical work in scraping lampblack from glass slides so as to form enlarged tracings of the aerial vibration.

"I was also familiar with Koenig's Manometric Flame Apparatus, the membrane of which was caused by the voice to vibrate against the pressure of gas admitted into the capsule from the ordinary gas pipes, so as to create a sensible vibration in the flame at the orifice of a capillary tube. At the very time also when this conception occurred to me ("that a single reed could be moved by the voice of the speaker in this manner by attaching it to a stretched membrane, and speaking against the membrane." Ans. 39), I was obtaining tracings of the vibrations of the bones of the human ear, and I reasoned that the disproportion in mass between the tympanic membrane and the bones that were moved by it was much greater than that existing between a membrane like that used in the phonautograph and the reed which I propose to operate by it."

As regards the ability to compass the details of mechanical construction, Mr. Bell had a practical experience, extending through the preceding two years, in experimental work, both upon multiple telegraph instruments, and especially in the construction and operation of phonautographs, in which art, apparently, judging from his testimony, he regarded himself as an "expert." Moreover, he had at this time the able assistance of a skilled electrical workman, Mr. Thomas A. Watson, whose qualifications are stated in his deposition (C. Vol. I, page 200) as follows:

"Int. 1. Please state your name, age, residence and occupation. A. Thomas A. Watson; twenty-five; Boston, Mass.; general inspector of the National Bell Telephone Company.

"Int. 2. When and how did you first become acquainted with Mr. A. G. Bell? A. By making instruments for experimental purposes for him, in the winter of 1874–5, at Charles Williams, Jr's, manufactory, 109 Court street, Boston.

"Int. 3. What knowledge or experience had you then relating to electricity and electrical apparatus? A. What I had gained by nearly two years' practical experience in Mr. Williams' manufactory, making electrical instruments, and also by study of various works on electricity and magnetism."

But notwithstanding Mr. Bell's admirable equipment for the task, we must not be surprised, now that we have some real appreciation of the difficulties which had to be met and overcome, should the fact subsequently be developed that in 1875 and prior to the date of his patent, March 7, 1876, he had utterly failed to solve the practical problem, to the solution of which he had addressed himself with such hopefulness on that memorable June second. Nor need it occasion much wonder should it become manifest that, instead of attaining to a practical embodiment of his principle in a working speaking telephone, he found at the end of his experiments and after all his efforts had been exhausted, that he had been unable to construct an apparatus by the use of which either he himself, or any one else, had been able to transmit even a single word of articulate speech.

And yet the fact will possibly be found to be established not only by a preponderance of evidence, but unquestionably, and even beyond a reasonable doubt.

XIII.

The earliest narrative of the efforts made by Mr. Bell toward the accomplishment of his undertaking during the month of *June*, 1875, contained in the record, is given in his Preliminary Statement in Speaking Telephone Interferences as follows (C. Vol. IV Exhibits, page 1008):

"My mind immediately recurred to the use of a membrane as a means of operating an armature so as to correspond with the vibrations of the air caused by vocal sounds; and either on the same day, or shortly after, I gave orders for the construction of two instruments in which the armature of an electro-magnet should be moved by the vibrations of a stretched membrane, to which it was connected.

"Such an instrument was constructed by Mr. Watson, during the month of June, 1875, but I am unable to fix the exact day.

"Upon putting it into circuit with a battery, the strength of the magnet and the weight of the armature were such as to tear the latter from the membrane, which was composed of goldbeater's skin. Portions of this membrane are still in existence, and I annex a drawing, marked "A," which corresponds in size to the parts now in my possession, and which correctly represents, as I believe, the instrument as originally constructed. So far as I can recollect, it was not until the first of July, 1875, that we were able to get the instrument in condition for trial. I fix this date, and the nature of the experiment, by a letter which I wrote on that day, a copy of which is as follows:

"SALEM, MASS., July 1, 1875.

"*Dear Mr. Hubbard:* The experiment to which I alluded when I saw you last, promises to be a grand success. In singing this afternoon in front of a stretched membrane, attached to the armature of an electro-magnet, the varying pitch of the voice was plainly perceptible at the other end of the line, no battery or permanent magnet being employed. When the vibrations are received upon another stretched membrane in place of a steel spring, it is possible —nay, it is probable—that the "timbre" of the sound may be perceived. I hope to try the experiment to-morrow afternoon. This morning, in dipping into a French work upon telegraphy, I came across a full description of the "Typo—Télégraphe de M. Bonelli." I find it to be *identical* with our autograph arrangement, save that five telegraph wires are required instead of one for transmission. Bonnelli gets over the difficulty of *prepared* ink by setting up his message in type. The brush of wires is passed over the raised surfaces of the letters, securing perfect contact at the proper places. I have an engagement to meet Prof. Lovering to-morrow morning at ten o'clock, and shall call upon you before returning to town.

"With kind regards,

"A. GRAHAM BELL.

"GARDINER G. HUBBARD, Esq.,
"Brattle Street, Cambridge."

"I have not seen this letter since I wrote it, until within three days and I had forgotten that I had made any such record of this experiment. It is obvious from this letter that the effects produced must have been due to the residual magnetism remaining in the armature after having been previously magnetized by the passage of a battery current.

"Another instrument with stretched membrane was immediately constructed, and the experiment, spoken of in said letter was tried, of transmitting speech."

Some additional details are given in his deposition in the *Dowd* case as follows: (C. Vol. 1, page 139.)

"Ans. 74. But the experiments above described, assured me that I had been mistaken in this idea, and I immediately upon this same 2d of June, 1875, gave instructions to Mr. Watson to have my membrane arrangement constructed. One of the reeds employed in our experiments upon that day was to have been hinged to the pole of its electro-magnet, instead of being clamped, and the free end of the reed was to have been attached to the centre of a stretched membrane; a duplicate was to have been constructed as a receiver. One of the instruments was constructed within the next few days; but instead of hinging the steel reed, as I had intended, Mr. Watson used a thick armature which was pivoted to the pole of its electro-magnet. Portions of this instrument are still in existence, and I now produce them. I produce a duplicate of the original instrument. This duplicate has recently been constructed. The armature now upon the duplicate instrument is thinner than the original armature, and I now produce a duplicate of the original armature. The parts of the original instrument which I have, are as follows: The wooden ring and wooden tube upon which the membrane was stretched, the original armature and electro-magnet and the cross-bar to which the magnet was attached, the uncovered leg of the magnet, to which the armature was attached, was removed a day or two after the original instrument was constructed and another substituted for it. The pole of the uncovered leg was filed to an edge, and a steel reed was hinged to it by means of a strip of leather. This substitute is the one now attached to the original magnet produced."

"Int. 77. How soon after the 2d of June, was the instrument described in your seventy-fourth answer made, when and where was it tried, and with what results? Ans. I was anxious to try the instrument at once, and could not wait to have the duplicate receiver made; so, immediately upon its construction, I attempted to use it with one of my harmonic receivers. Upon passing a battery current through the coils of the instruments, however, the attraction of the magnet was so great as to tear the heavy armature away from the membrane. Mr. Watson and I made a number of experiments with other membranes in place of the original, and I remember that we were enabled to use the instruments for a practical experiment at least upon one occasion. The stretched membrane arrangement was placed in one of the rooms in the top part of Mr. Williams' building, and an ordinary harmonic reed receiver in the lower workshop. I do not now remember whether any battery was used, but it is my impression that in consequence of the accidents to our membranes we made the experiment without a battery. I distinctly remember shouting into the stretched membrane instrument, while Mr. Watson was down stairs listening, with his ear pressed against the reed of the harmonic receiver. I do not remember definitely what the results were, excepting that I was encouraged by them to reconstruct the instrument with a lighter armature. I can not fix the exact date of the experiment, and only know that it was during the month of June 1875.

"Int. 78. What difficulty did you find from the heavy armature which led you to try a lighter one? Ans. The armature was so strongly attracted by the electro-magnet as to be frequently torn from the membrane, and I presumed that a lighter armature would not only be less attracted, but would also be more easily moved by the membrane and would not be so liable to become detached.

"Int. 84. Did you at or about the date of that letter (of July 1, 1875, to Mr. Hubbard, already quoted) cause to be constructed a second membrane telephone; and, if so, when, and have you any of the parts of it? Ans. The same day I wrote this letter, namely, July 1, 1875, I gave instructions to Mr. Watson to have constructed a second membrane telephone. The instrument was completed a day or two afterward, and some parts of it are still in existence and I produce them.

Int. 85. Have you a duplicate constructed in accordance with said original second membrane telephone? If so, please produce it. Ans. I have, and I now produce it.

"Int. 86. Please look at the wooden ring and membrane now shown you, and state wherein it resembles or differs from the wooden ring and membrane now on said duplicate second instrument. Ans. It differs from it in the membrane being made of sheepskin instead of goldbeater's skin.

"Int. 87. Did your second instrument have the armature hinged to the uncovered leg of the magnet like said duplicate, or did it have it attached with a leather hinge, as described in your seventy-fourth answer? Ans. I am not sure but my impression is that it was hinged with a leather hinge.

"Int. 88. What were the membranes made of in your original telephones of June and July, 1875? Ans. Of goldbeater's skin used in single and sometimes double thicknesses."

Further details of Mr. Bell's experimental work during this period were given upon his cross-examination in 1883, as follows (C. Vol. II, page 1582, *et seq*):

"Ans. 298. The following figures show the construction of the first membrane telephone constructed, with some of the improvements that had been made on the instrument prior, I think, to the construction of the second instrument." (Here follow figures and description of the same.) "In this instrument, as originally constructed, the armature A consisted of a thick piece of soft iron. If my recollection is correct, the end of the armature was at first glued or cemented to a cork which was fastened in a similar way to the center of the membrane M.

"The powerful attraction of the electro-magnet C would cause the armature to be detached from the membrane, and it was this fact that led to improvements in the methods of attachment. One of these improvements consisted in attaching the cork to the membrane by a screw which passed up through the membrane, causing the latter to be clamped tightly between the cork and a metal washer. This is shown in the figure I am describing. Another improvement consisted in the substitution of a little metal pillar for the cork. This is shown in the drawing that I shall describe further on. These improvements, however, did not meet the difficulties of the case. When the instrument had been so arranged that the armature could not be detached from the membrane, then the attraction of the electro-magnet caused the rupture of the membrane. This led to the employment of thicker membranes and thinner armatures. In the above drawings the armature A consisted of a piece of steel spring, pivoted at one end to the pole E, and attached at the other to the membrane M.

"I have already stated that the armature was first attached to the electro-magnet by means of a pivot. Subsequently, the uncovered leg E of the electro-magnet was filed to a sort of knife edge, and the end of the armature A was attached to it by means of a leather hinge, as shown in the drawing of the second instrument which will be described further on. The operator spoke into the tube T and listened at it when receiving. I can not say that we spoke and listened exclusively at the end of the tube T. My recollection is, that we spoke to the instrument and listened to it, holding it in various positions in relation to the mouth and ear."

"Cross-Q. 304. You have stated that after the membrane had been torn by the action of the electro-magnet, a thicker membrane was adopted; please state the materials of the different membranes to which you refer, and give us as definite an idea as you can of their actual and relative thickness? Ans. The first membrane was made of gold-beaters' skin as usually found in the market. This proved insufficient for the strain put upon it by the magnet, and we adopted the plan of using more than one layer of gold-beaters' skin. I believe we also employed membranes of other materials, but I can only give my general recollection, and can not say positively at the present moment that this was the case. I had made numerous experiments with phonautographs, constructed by myself, in which the membrane employed consisted of bladder, and it is my impression that some of our membranes were constructed of this material. I can not give any definite idea of the actual thickness of the membranes. We simply tried to make them sufficiently stout and tense to stand the pull of the electro-magnet.

"Cross-Q. 305. By "we," I suppose you mean yourself and Mr. Watson; do you not. Ans. Yes.

"Cross-Q. 309. If I understand you correctly, the cork connection from the armature to the diaphragm was not used after you employed the metal pillars which are shown attached to these armatures; am I not right? Ans. I do not know, my impression is that it was frequently used.

"Cross-Q. 314. In your letter to Mr. Hubbard of July 1, 1875 (page 143 of complainant's printed record), you refer to an experiment made that afternoon; the transmitting instrument used in that experiment was one of the two machines about which you have been testifying; was it not? Ans. Yes, it was the first one.

"Cross-Q. 315. Do you remember the condition of that machine at the time of that experiment—whether it was before the improvements had been made, or whether any, and if so, which of the improvements had been applied to it, and was used on it at that time? Ans. I do not remember. My recollection of the experiment is derived simply from the letter.

"Cross-Q. 316. I see no indication in the letter that in that experiment of July 1st there was any trouble from the rupture of the membrane or detachment of the armature therefrom, and hence I judge that you had already before that date gotten over those two difficulties; what is your recollection or opinion about that? Ans. My impression agrees with that, although no mention of a battery as having been used is made, so that the membrane would not have been likely to be ruptured. My impression that the improvements to obviate this had already been made, is based upon the fact that I gave orders for the construction of the instrument on the second of June, whereas this experiment did not take place until the first of July. I was so anxious to try the experiment, that it must certainly have been made at the earliest possible moment the instrument could have been used. It is possible, however, nay, probable, from the first line of the letter of July first, that the experiment had been previously tried with indifferent or doubtful results. My opinion is that experiments had been tried and modifications made before the date of this letter, but I can not be absolutely certain about it."

Mr. Bell's untiring efforts and the experiments and the resulting improvements made during the month of June, 1875, culminated in the encouraging experiment of July first, as related in the letter of that date to Mr. Hubbard, substantially to the following effect:

The experiment promised to be a grand success. With a stretched membrane attached to the armature of an electro-magnet, as a transmitter, and placed in circuit with an ordinary harmonic reed receiver, the varying pitch of the voice was plainly perceptible, but not the quality. With another membrane instrument provided for a receiver it was possible, nay, probable, that the *timbre* or quality of the sound could be perceived, and he hoped to try the experiment the very next day.

XIV.

The second instrument provided with a membrane and an attached armature was completed a day or two afterward, and the duplicate instruments were arranged together upon the circuit.

We have now to ascertain, to the best of our ability and from the complainant's record, the facts regarding the results actually obtained by Mr. Bell in the various trials and experiments made with these instruments.

The first statement made by Mr. Bell upon this subject, contained in the record, is found in his celebrated "London Lecture," delivered before the Society of Telegraph Engineers at London, England, October 31, 1877, as follows (C. Vol. IV, Exhibits, page, 899):

"I immediately proceeded to put my new idea to the test of practical experiment, and for this purpose I attached the reed A (Fig. 23) loosely by one extremity to the uncovered pole *h*, of the magnet and fastened the other extremity to the center of a stretched membrane of gold beaters' skin *n*.

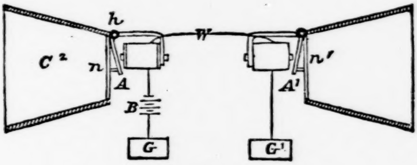


FIG. 23.

"I presumed that upon speaking in the neighborhood of the membrane *n*, it would be thrown into vibration and cause the steel reed A to move in a similar manner, occasioning undulations in the electrical current that would correspond to the changes in the density of the air during the production of the souud; and I further thought that the change of the intensity of the current at the receiving end, would cause the magnet there to attract the reed A¹ in such a manner, that it should copy the motion of the reed A, in which case its movements would occasion a sound from the membrane n^1, similar in *timbre* to that which had occasioned the original vibration.

"The results, however, were unsatisfactory, and discouraging. My friend, Mr. Thomas A. Watson, who assisted me in this first experiment, declared that he heard a faint sound proceed from the telephone at his end of the circuit, but I was unable to verify his assertion.

"After many experiments attended by the same only partially successful, results I determined to reduce the size and weight of the spring as much as possible. For this purpose I glued a piece of clock spring, about the size and shape of my thumb nail, firmly to the center of the diaphragm, and had a similar instrument at the other end (fig. 24); we were then enabled to obtain distinctly audible effects."

Mr. Bell has fixed the time when this last construction was made, as follows (C. Vol. 1, page 173):

"Int. 180. When did you first construct a membrane telephone with a piece of clock spring, about the size and shape of your thumbnail, glued to the center of the diaphragm? Ans. Shortly after the granting of my patent of March 7, 1876; I think within the month of March."

The latest statement in the record made by Mr. Bell relating to this matter, was given by him upon the occasion of his renewed cross-examination in 1883, as follows (C. Vol. 2, page 1574):

"Cross-Q. 281. When did you first succeed in getting your electric-speaking telephone to transmit vocal speech so that it was heard and understood from the receiver? Ans. Somewhere about June or July, 1875. The articulation of the instrument was not entirely intelligible at this time, but I feel perfectly sure that many words were understood, although I can not recall the details of any particular experiment made at this time when the words were fully understood.

"Cross-Q. 282. Can you state the circumstances under which any experiment was made in June or July, 1875, at which any word was heard and understood through the instruments? Ans. My recollection of these experiments is very vague, but I remember distinctly that on one occasion I was speaking to a membrane telephone (of the form marked in this case as 'telephone of 1875') in the top part of Mr. Williams' factory, 109 Court street, Boston, while Mr. Thomas Watson was listening to an instrument in the workshop below. I was interrupted by the sudden appearance of Mr. Watson, who had rushed up stairs in a state of great excitement, and who declared that he had heard vocal sounds proceed from the instrument to which he had been listening, and that he could almost understand what was said. We then changed places, but I was unable to hear anything on that occasion. This inability I attributed, at the time, to the noise of the machinery in the workshop, and to the fact that Mr. Watson was unable to throw out his voice with sufficient force to set the membrane of his telephone into good vibration. I have a general recollection that numerous similar experiments were made during June and July, and that I, myself, obtained audible results. It is my impression that a few common words or sentences were occasionally understood, but I can not give the details of any particular experiment in which this was the case. I only remember that the results were such as to lead me to the firm conviction that the speaking telephone was a *fait accompli*. In consequence of this, I took out a patent for the speaking telephone without waiting to obtain better results.

"Cross-Q. 283. Am I to understand you that when your patent of March 7, 1876, issued, you had attained no better results than the results which you attained in June and July, 1875? And if that is not your meaning, please explain more fully what you mean by the last part of your last answer. Ans. That is my meaning.

"Cross-Q. 284. Did Mr. Watson assist you in all your telephone experiments in June and July, 1875? Ans. He did.

"Cross-Q. 285. In the experiment to which you referred in answer to cross-question 282, when Mr. Watson interrupted you by rushing up and announcing that he had heard vocal sounds, he also informed you that he could not make out through the instrument what you said, did he not? Ans. He did: he said 'he could almost understand what I said.'

"Cross-Q. 286. He did not state any word that he thought he had heard, did he?" Ans. I don't remember; I can not recall the experiment in any detail; I simply have the general remembrance of the excitement which he manifested, and of my disappointment at not being able to hear what he had.

"Cross-Q. 287. From his excitment I should judge that that experiment had produced better results than any prior experiment; is that your understanding? Ans. It may be so.

"Cross-Q 288. When you exchanged places with him during that experiment you were not able to understand any words through the telephone, were you? Ans. No.

"Cross-Q 289. And if I understand you correctly, you were also disappointed in not being able to personally verify Mr. Watson's statement as to the result obtained. Am I not correct? Ans. Yes; in regard to that experiment.

"Cross-Q 290. Do you remember any other experiment which you made between that time and the issue of your patent of March 7, 1876, in operating, or attempting to operate, speaking telephones? Ans. I remember that I made a number of experiments during June and July, the details of which I have forgotten."

Here is a manifest conflict of testimony. Upon close examination, however, it will be found that, while the assertions made in his deposition produce, most decidedly, an impression wholly inconsistent with the tenor of the passage cited from his London lecture, yet all these expressions are so qualified and so shaded off as to their imputed reliability that not a single statement of fact, in conflict with the explicit statements made by Mr. Bell in his London lecture is made positively and without the mention of circumstances which tend to detract from its reliability.

The statement that he first succeeded in getting his apparatus to transmit vocal speech so that it was heard and understood "somewhere about June or July, 1875," taken by itself would be absolutely irreconcilable with the tenor of his narrative at London. But the reliability of this statement is immediately weakened by Mr. Bell, in the very next sentences, by showing that it was based upon his feeling of confidence, rather than upon his actual knowledge and definite recollection. "The articulation of the instrument was not entirely intelligible at this time,'' nevertheless, "although I can not recall the details of any particular experiment made at this time when the words were fully understood," yet, "I feel perfectly sure that many words were understood."

"My recollection of these experiments is very vague," yet "I remember distinctly that on one occasion," Mr. Watson declared "that he had heard vocal sounds proceed from the instruments to which he had been listening, and that he could almost understand what was said."

"He did not state any word that he thought he had heard, did he? I don't remember; I can not recall the experiment in any detail; I simply have the general remembrance of the excitement which he manifested, and of my disappointment at not being able to hear what he had." And "he also informed you that he could not make out through the instrument what you said, did he not?" "He did; he said 'he could almost understand what I said.'" "I have a general recollection that numerous similar experiments were made during June and July, and that I, myself obtained audible results." "I remember that I made a number of experiments during June and July, the details of which I have forgotten." "It is my impression that a few common words or sentences were occasionally understood, but I can not give the details of any particular experiment in which this was the case." "I *can only remember* that the results were such as to lead me to the firm conviction that the speaking telephone was a *fait accompli*."

Under ordinary circumstances, were it absolutely necessary, one would find it not impossible in weighing together two such contradictory statements, to form for himself a reasonably certain conclusion as to the actual fact. This could be done by giving due and proper weight, on the one hand, to a class of assertions made eight years after the event and confessedly based upon vague recollections, general remembrances and mere impressions, and upon the other hand, to positive unqualified statements, made in public, in an address delivered before a body of eminent scientific men, and at a time when the events were fresh in mind, and when, owing to the intense public interest in the subject, every detail in the history of the development of the invention was eagerly welcomed.

But, fortunately, we are relieved from the necessity of even considering the question in this phase of its presentation, for we find upon examination that Mr. Bell has from time to time placed himself upon record in a manner so unequivocal and has made such positive statements of the facts involved, that there would seem to be no room left for discussion.

The year following the delivery of his London lecture Mr. Bell wrote his "Preliminary Statement in Speaking Telephone Interferences," sworn to November 20, 1878, in which he again recited the history of the development of his invention. The facts, were then stated by him as follows (C. Vol. IV Exhibits, page 1009):

"Another instrument with stretched membrane was immediately constructed and the experiment spoken of in said letter (of July 1st to Mr. Hubbard already quoted) was tried, of transmitting speech. One instrument was placed in my experimental room at the top of the building and the other in the workshop below. I spoke from my room to Mr. Watson and he spoke to me from below. I heard nothing, but Mr. Watson soon rushed upstairs and said he could hear my voice but could not make out what I said. We then changed places, but with the same result; he heard my voice but I could not hear his. I am unable to say whether we used the instruments with a battery or without, as on the previous occasion referred to in the letter to Mr. Hubbard. I am free to say that the results were not as good as I expected, but I believed that the failure to obtain better results was due to the imperfect construction of the instruments, or to their parts not being properly proportioned. I fully believed that the elements combined in that apparatus were capable of giving better results than I attained in these experiments, and that the instruments embodied an important and valuable invention. I saw clearly that a current was induced different from that which attended the use of any other apparatus with which I am acquainted, and which was characterized, not by makes or breaks of regular or irregular intervals or even by waves or impulses of equal strength or duration, but by impulses which corresponded to the vibration of the air which moved the membrane. I had combined elements which had never before been combined, and had produced entirely new results.

"A few weeks after this I was obliged to go to Canada, and I was therefore compelled temporarily to suspend my labors upon these inventions."

The next year, in 1879, Mr. Bell gave his deposition in the *Dowd* case, and at the close of his cross-examination his attention was directed to the foregoing passage, but without eliciting, either then or upon the re-direct examination, any assertion in qualification of the definite statements of fact made in the passage cited. (C. Vol. I, page 197.)

"Cross-Int. 258. Does your preliminary statement in the Speaking Telephone Interference, sworn to Nov. 20, 1878, contain the following: 'Another instrument with stretched membrane was immediately constructed, and the experiment spoken of in said letter was tried, of transmitting speech. One instrument was placed in my experimental room at the top of the building, and the other in the workshop below. I spoke from my room to Mr. Watson, and he spoke to me from below. I heard nothing, but Mr. Watson soon rushed upstairs, and said he could hear my voice but could not make out what I said. We then changed places, but with the same results. He heard my voice, but I could not hear his?' Ans. It does."

"Cross-Int. 259. The apparatus used in the experiment described in this quotation was the apparatus described in your patent of 1876, on which this suit is brought, and delineated in Fig. 7 of the drawings, was it not? Ans. It was substantially similar.

"Cross-Int. 260. Do you remember any difference between that apparatus used in that experiment and the apparatus described and shown in the patent? Ans. I do. The transmitting and receiving cones shown in the patent were not employed. The armatures used in the experiment referred to were hinged to the uncovered leg of the magnet by a strip of leather. The coils used in the experiment were not specially adapted for use upon a line. I am not sure also whether any battery was used in the experiment.

"Cross-Int. 261. Do you remember anything more in regard to the construction of that experimental instrument, either as to what it did contain and the patent does not, or to what it did not contain and the patent does? Ans. The experimental instrument had an arrangement for straining the membrane and a frame-work for holding the magnet, which are not shown in the patent."

On the direct examination at that time Mr. Bell's attention was also particularly directed to the passage already cited from his London lecture, when he further testified as follows (*Ibid.* page 172):

Int. 174. I call your attention to your London lecture, delivered before the society of telegraph engineers, extracts from which have been put in evidence for the defendant; please state the circumstances under which you delivered that lecture? Ans. I was invited to deliver a lecture before the society of telegraph engineers for the purpose of showing the various steps that had resulted in a speaking telephone. I accepted the invitation and a special general meeting of the society was called. I delivered the lecture on the 31st of October, 1877, without notes, giving the various stages as well as I could from memory, as I had no memoranda with me to which to refer.

"Int. 175. I call your attention to the extract on page 407 of that lecture, which the defendant has put in on page 183 of the record. State what experiment it was that you had in mind and which you there referred to in the following sentence: 'My friend, Mr. Thomas A. Watson, who assisted me in this experiment, declared that he heard a faint sound proceed from the telephone at his end of the circuit, but I was unable to verify his assertion.' Ans. I gave my recollection of the result of the first experiment made with the membrane telephone referred to in my seventy-fourth answer. (previously cited, *ante* page —.)

"Int. 176. At the time you gave you London lecture, what was your recollection as to the receiver used at that time, and as to whether your two first membrane telephones were made at the same time or at different times? Ans. It was my recollection that immediately upon performing the experiment illustrated by Fig. 22 and described in my seventy-first answer, (*ante* page .) I gave my instructions to Mr. Watson to have two membrane telephones constructed: that they were constructed within a few days, and tried, with the results noted in the passage quoted in the preceding question. My impression at the time of my lecture was that my first two membrane telephones were constructed at the same time, and that one of them was used as a receiver in my first experiment.

"Int. 177. State whether you did or did not, before the issue of your patent of March 7, 1876, construct or use any membrane speaking telephones other than the two of which

Exhibits 19, 22 [original Nos. 31, 34] (see your seventy-sixth and eighty-seventh answers) are duplicates? Ans. I did not.

"Int. 178. What did you mean by the following passage from page 407 of your London lecture. 'The results, however, were unsatisfactory and discouraging?' Ans. I expected so much that I was naturally disappointed to be unable myself to hear the results I had anticipated.

"Int. 179. Were you or were you not discouraged by these discouraging results? Ans. I was not. I wavered in a full and firm belief that I had solved the problem of the transmission of articulate speech electrically, and that the apparatus we had constructed could be used for that purpose.

"Int. 180. When did you first construct a membrane telephone with a piece of clock spring about the size and shape of your thumb nail, glued to the centre of the diaphram? Ans. Shortly after the granting of my patent of March 7, 1876; I think within the month of March."

While Mr. Bell would apparently have the sentence: "My friend, Mr. Thomas A. Watson, who assisted me in this first experiment, declared that he heard a faint sound proceed from the telephone at his end of the circuit, but I was unable to verify his assertion," now understood as having been uttered with reference to the first experiment made with a single membrane instrument combined with a harmonic receiver, it is noticable that he makes no qualification whatever, either as regards the statement of fact contained in that sentence, or of the succeeding expression: "After many experiments attended by the same only partially successful results, etc." While in his last quoted answer Mr. Bell fixes beyond question the date of the construction of the instruments referred to in the immediate context, and concerning which Mr. Bell had stated, "We were then enabled to obtain distinctly audible effects," as being subsequent to the granting of his patent of March 7, 1876.

This was re-affirmed by Mr. Bell, and without qualification, when his attention was again directed to the subject in 1883. (C. Vol. 2, page 1650. *Cross-Q.* 472.)

But upon his examination in the *Dowd* case in 1879, Mr.

Bell was asked to make independently another statement of the facts, when he testified very briefly as follows (*Ibid.* page 145):

"Int. 90. Did you try these two telephones in July, 1875, one as transmitter and one as receiver; and if so, where and with what results? A. I did. One of the instruments was placed in the room at the top of Mr. Williams' building, and the other in the workshop below. I spoke to one of the instruments while Mr. Watson listened at the other, and *vice versa.* I do not remember with any great distinctness the details of the experiment, but I have a distinct recollection that during the course of the experiments Mr. Watson rushed up to the room at the top of the building where I was and informed me that he could distinctly hear me speaking, although he could not quite make out what I said. He had satisfied himself that the sounds he had heard, had been produced by the membrance telephone to which he had been listening.

"Int. 91. Was Mr. Williams' work-shop a quiet place or a noisy place at the time that you tried these experiments? Ans. A very noisy place."

Upon comparing together these additional statements, which all tell one and the same story, we are compelled to believe that story, that it was the whole story, and that if Mr. Bell could have truthfully made it stronger, when the events were comparatively fresh in mind and when there was every inducement to do so, he would have done it. Under the circumstances of each case, the demand was made upon him to detail explicitly the actual results attained with these instruments and without reservation or qualification except that in the last case cited the demand was limited to the results obtained in July, 1875. Even this limitation was immaterial, since he has expressly stated in answer to Cross-Q. 283 (already quoted) that when his patent of March 7, 1876, issued, he had attained no better results than the results he had attained in June and July, 1875.

We are therefore forced to the conclusion by the weight of Mr. Bell's own testimony, that with these instruments Mr. Bell, in fact, "heard nothing," and that Mr. Watson

" heard a faint sound " from Mr. Bell's " voice," but " could not make out what was said; " in a word, that Mr. Bell was unable to hear a sound from these instruments, while Mr. Watson, hearing a sound, was unable to distinguish a word; and that it was only from a construction made subsequently to the granting of the patent, that they were " enabled to obtain distinctly audible effects."

XV.

But we are not compelled to rest our conviction of the truth upon Mr. Bell's statements alone. It is confirmed by the statements of every witness in the record, whose testimony bears upon the subject.

Mr. Watson, who was Mr. Bell's assistant during all these experiments, testified in his direct examination in the *Dowd* case as follows (C. Vol. I, page 203):

"Int. 11. Please look at the permanent magnet now shown you, and which is the one produced by Mr. Bell in answer to Int. 73. State whether it is or is not the permanent magnet referred to in your last answer, and whether it is or is not in the same condition it was in when you so used it? Ans. It is the identical magnet then used, but has since been mounted on a standard and painted.

"Int. 12. When did Mr. Bell direct you to make the first membrane telephone you ever saw, and when did you make it? Ans. June 2, 1875; the same day that the experiment noted in my ninth anwer took place, and immediately after it. I think I completed the instrument the next day, but certainly within three days.

"Int. 13. Describe the first experiment you tried with it. Ans. We had a line running from the attic of Mr. Williams' factory to the third story. In the attic we connected to this line the membrane telephone. In the third story we connected a harmonic receiver. I shouted into the membrane telephone. Mr. Bell listened at the receiver. I think he heard nothing. We changed places. He shouted at the telephone and I listened at the receiver. I could hear a faint sound. We were not able to use the instrument but a very short time, as the membrane got torn. I do not remember whether there was a battery in circuit or not but I think we tried it both with and without.

"Int. 14. Did you afterwards make a second membrane instrument, and if so, when? Ans. I did; some time during the following month or six weeks.

"Int. 15. Do you remember trying two membrane telephones, using one instrument as a transmitter, and the other as a receiver? If so state where such experiment was made and the results obtained in it. Ans. I do; the experiment was made on the line described in my thirteenth answer. I think the results were a slight improvement on what we had previously obtained. My recollection of this experiment is confused with that which preceded it, extending through the month of June, 1875."

Mr. Watson was re-called August 28, 1882, when he further testified as follows (*Ibid.*, page 309):

"Int. 120. If you have any memorandum of articulate speech transmitted by you and Mr. Bell with a liquid transmitter in March, 1876, will you please read it? Ans. I have such memorandum from a note book I was using at that time. It reads as follows:

March 10, 1876.

"'Mr. Watson come here; I want you. How do you do? God save the Queen!' and several other articulate sounds.

"Int. 121. When you heard that at the receiver, who was speaking into the transmitter? Ans. Mr. Bell.

"Int. 122. Where was the experiment? Ans. Between two rooms at Mr. Bell's laboratory, No. 5 Exeter Place.

"Int. 123. What liquid, if you remember, was used? Ans. Water, with a little sulphuric acid in it.

"Int. 124. Of what material, if you remember, was the wire which was attached to the membrane and dipped into the liquid? Ans. Platinum."

Upon his cross-examination he then gave the following testimony (*Ibid.*, page 311):

"Cross-Int. 134. In that experiment of March 10, 1876, did you make the memorandum in your memorandum book at the time of your experiment? Ans. I did; either the same evening or the next morning.

"Cross-Int. 135. Did you make memorandum of all the words that were spoken into the transmitter, or only of such as were heard at the receiver? Ans. Only such as I heard.

"Cross-Int. 136. I suppose a great deal was spoken into the transmitter which you could not hear at the receiver, was there not? Ans. I have no positive recollection as to how much I heard, or as to how much was said. I know, however, that the result of the experiment created great enthusiasm in my mind."

"Cross-Int. 142. In your answer to Cross-Int. 136, you say that the result of that experiment created great enthusiasm in your mind; why was your mind so greatly excited over that? Ans. Because the results were so much of an improvement on what I had previously heard in the telephone line.

"Cross-Int. 143. Was that the first time that you had heard speech successfully transmitted over a telephone line? A. I had heard the previous summer the sound of Mr. Bell's voice through the telephone, but not nearly so well as on the March 10, 1876, experiment.

"Cross-Int. 144. Prior to March 10, 1876, had you ever heard and understood any spoken words through a telephone—I mean through any electric telephone? A. I have no recollection of having heard more than the sound of Mr. Bell's voice prior to that experiment, but I can not positively assert that such was the case.

"Cross-Int. 145. In brief you have no recollection of ever having heard a word through any electric telephone prior to March 10, 1876; is not that the fact? A. The only recollection of experiments on speaking telephones prior to March 10, 1876, that I have, is that conveyed in my answers to Ints. 13 and 15, p. 203 in this case.

"Cross-Int. 146. By referring to said thirteenth and fifteenth answers, I find that they do not definitely answer the question which I have just asked. I therefore repeat the question, and call for a definite answer to it. Ans. *I have no recollection of having understood anything that was said through the telephone prior to March 10, 1876.*"

"Cross-Int. 224. When was the first time that you ever heard and understood words transmitted over a telephone line by means of a magneto-transmitter? Ans. My recollection now is that I heard and understood words from a magneto-transmitter shortly after March 10, 1876.

"Cross-Int. 225. Is that magneto-transmitter illustrated here in any of the cuts in evidence in this case? Ans. I do not remember precisely what it was, but it was similar to Exhibits 26 or 27.

"Cross-Int. 226. To the best of your recollection, how long after March 10, 1876, was it that you first heard spoken works successfully transmitted over that magneto instrument? Ans. To the best of my recollection during March or April, 1876.

"Cross-Int. 227. That instrument had a membrane diaphragm, I suppose, had it not? Ans. I think it had.

"Cross-Int. 228. Describe the armature, its size, shape, material and manner of attachment to the diaphragm in that instrument. Ans. All that I can remember about it is that it consisted of a piece of clock spring shellacked to the membrane. I do not remember the dimensions at all.

"Cross-Int. 229. Was that the first magneto instrument which had a metal armature attached to and supported only by the diaphragm? Ans. It was the first I remember.

"Cross-Int. 230. Who made that instrument, and when? Ans. I think I did just before it was tested.

"Cross-Int. 231. It was made after March 10, 1876, was it not? Ans. According to my recollection."

These reluctant admissions, fairly forced from the witness, impress one with a profound sense of their truth, and serve but to deepen the conviction at which we have already arrived.

The only other witness who has testified upon the subject is Mr. Gardiner G. Hubbard. His testimony was given in the Dowd case in 1879, as follows (Drawbaugh IV Exhibits, page 957):

"Int. 10. All the letters dated at Salem, refer to certain apparatus which the writer says he was using or experimenting with at Salem or Boston. Did you see any of the apparatus referred to in each of those letters respectively, and if so, when and where, for the first time. Ans. I made an arrangement with Mr. Charles Williams, Jr., manufacturer of electrical instruments, by which he furnished machinery, and one of his workmen, Mr. Watson, to make such instruments as Mr. Bell requested. I was in the habit of going very frequently to Mr. Williams' shop to see what was going on, and believe that I there saw the various instruments, as well as many others described in these letters. I was more particular to see the things described in the letters, as they were supposed to be of the most importance, and should have noticed if there was any omission of the things described in the letters. Most of them I have a distinct recollection of. On further reflection, I think Mr. Bell may have made the first arrangement with Mr. Williams.

"Int. 11. Do you remember any apparatus or experiment made at the time of those letters, in which a sound was made on the receiving instrument, by plucking with he finger, or by any other mechanical means, a reed on he transmitting instrument? If so, state whether you saw h an exhibition more than once. Ans. I recollect distinctly what Mr. Bell calls the steel reed described in his letter of July 7, 1875, plucking it by the finger and listening to the corresponding instrument vibrating, and think he had a bellows there which he operated, but am not so confident as to the bellows.

"Int. 12. State whether or not you remember, during the period of these letters, seeing Mr. Bell have an apparatus in which the reed was attached to a membrane, and if so, how was the membrane to be moved or vibrated? Ans. I remember distinctly two instruments, to each of which a membrane was attached, and I think a reed was fastened to the membranes, but I am not certain, and that he undertook to speak to one membrane while Mr. Watson or myself was to hear at the other instrument. The instruments were so arranged that the membranes could be stretched till they were quite tight, like a small drum head. I could hear a sound, but could never distinguish any spoken words."

Discussion is unnecessary. The testimony of these witnesses has established the fact beyond controversy. But even the possibility of a reasonable doubt is effectually removed by the production in the record, of a memorandum in Mr. Bell's own handwriting, made by him December 28, 1875, containing an exact statement of the results obtained with these instruments.

Mr. Bell has testified concerning this memorandum as follows (C. Vol. 1, page 158):

"Int. 125. Please look at the paper now shown you; state who made it. Ans. I did.

"Int. 126. When and where and for what purpose? Ans. I made it at the Queen's Hotel, Toronto, on the twenty-eighth day of December, 1875, for the information of the Hon. George Brown.

"Int. 127. What occasion had you to give him information on the matters shown in that paper? Ans. I expected to conclude arrangements for having him take out our patents in England for me, and made this drawing to illustrate certain of my inventions.

"Int. 128. Is that the same Mr. George Brown spoken of in your letter to Mr. Hubbard of September 28, 1875, which was read as part of your one hundredth answer? Ans. It is.

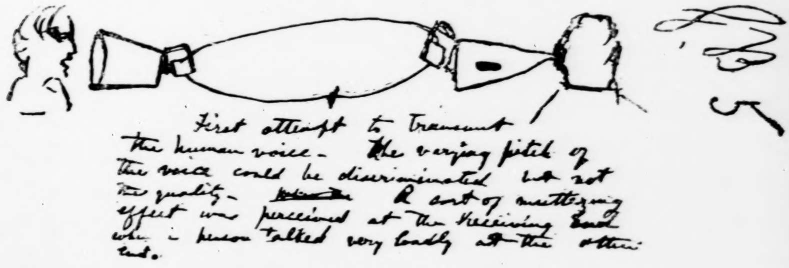
"Int. 129. State generally what inventions or what apparatus that paper shows. Ans. The invention and apparatus described in my United States patent, dated March 7, 1876.

"Int. 130. There appears to be a memorandum on the back of it not in your handwriting. Who wrote that? Ans. The Mr. George Brown referred to.

"Int. 131. In whose possession did you leave it after you made it, and when did you next see it? Ans. I left it in the possession of the Hon. George Brown in Toronto, on the twenty-ninth day of December, 1875, and I next saw it in Toronto on the 12th of November, 1878, and requested Mr. Brown to intrust it to Mr. Thomas A. Watson, who brought it on to Boston

Complainants put in evidence the paper referred to, and it is marked "Complainants Exhibit 25, Bell's Toronto Drawing, W. P. Preble, Jr., Examiner." [*Original number 37.*]

The following is a fac-simile of one of the sketches in said drawing.



First attempt to transmit the human voice. The varying pitch of the voice could be discriminated but not the quality. A sort of muttering effect was perceived at the receiving end when a person talked very loudly at the other end.

Upon his cross-examination Mr. Bell further testified regarding these sketches as follows (C., Vol. II, page 1657):

"Cross-Q. 492. Complainants' Exhibit No. 25, Bell's Toronto Drawing, printed opposite page 32 of the complainants' exhibits in this case, contains certain sketches, three in number. Under one of them are the words, 'Present form of multiple telegraph. One main battery closed circuit. Communication in both directions without induction coils. Patents not yet applied for. A. G. B.'

"Under another of them are the words, 'Discovery that led to the above form of multiple telegraph,' and under another are the words, 'First attempt to transmit the human voice. The varying pitch of the voice could be discriminated, but not the quality. A sort of muttering effect was perceived at the receiving end when a person talked very loudly at the other end.'

"In the original paper here referred to, in whose handwriting are the words that I have quoted from it? Ans. In my handwriting.

"Cross-Q. 493. If I understand your testimony correctly, that paper was made by you at Toronto, Canada, December 28, 1875, to show to Hon. George Brown, whom you were endeavoring at that time to induce to become interested with you in procuring an English patent on your invention and to furnish capital therefor; is my understanding correct? Ans. Yes; I expected him to take out other foreign patents as well as English.

"Cross-Q. 494. On that paper the sketch immediately over the words 'first attempt,' etc., bears a striking resemblance to Fig. 7, of your patent of March 7, 1876; was the sketch made as a copy of that figure, or was the figure in the patent a copy of the sketch? Or were the figure and the sketch made independently of each other to represent the same idea in your mind? Ans. Both this sketch and Fig. 7 of the patent were intended to illustrate the form of speaking telephone at which I had then arrived."

The explanatory passage accompanying the sketch which Mr. Bell declares was "intended to illustrate the form of speaking telephone at which I had then arrived" and written by him at Toronto, December 28, 1875, to be shown to Mr. Brown in explanation of the very matter in which he was then endeavoring to induce him to become personally interested, must be regarded as a *bona fide* statement by Mr. Bell, in the strongest permissible language of the actual results that had then been achieved in this first attempt to transmit the human voice.

These results were summed up in the explicit statement that, "*The varying pitch of the voice could be discriminated, but not the quality. A sort of muttering effect was perceived at the receiving end when a person talked very loudly at the other end.*"

The evidence upon this point is so absolutely overwhelming that even complainants' able counsel, appreciating its force, was compelled to admit in his recent argument in the telephone case, at New Orleans, before the United States Circuit Court, for the Eastern District of Louisiana, that the results got from these instruments did not, in fact, amount to the intelligible transmission of articulate words. Although, in justice to the counsel, it should be stated that this admission was very shrewdly coupled with an assertion, by way of avoidance, that certain conclusions were drawn by Mr. Bell at the time, "nevertheless," and notwithstanding, the existence of the facts as admitted. The entire passage from the printed argument is as follows:

> "Mr. Bell's letters of 1875 show, that he was striving to devise some variation in his instruments which should enable them more effectively to carry out his plans, when, in the course of an experiment on another subject, he accidentally discovered that what he had supposed to be a serious objection had no real basis. He instantly caused to be made a membrane telephone, and subsequently tried that and another together and got results, but which, it is claimed, and probably truthfully, did not amount to the intelligible transmission of articulate words. Nevertheless, he was satisfied that it was a mere question of good mechanical construction of instruments, and that he had made the invention." ("*Argument of J. J. Storrow, for Complainants,*" page 36.)

Every circumstance in the case is consistent with the conclusions to which we have been driven.

Thus, for example, Mr. Gardiner G. Hubbard had previously made an arrangement with Mr. Bell under which he was to write to him from time to time regarding the progress made in the development of his inventions, that the letters might be preserved as evidence, if required, in case of litigation. The arrangement was narrated by Mr. Hubbard in his deposition as follows (C. Vol. IV Exhibits, page 956):

> "Ans. 7. Mr. Bell, at my request, was in the habit from time to time of writing letters to me recording the progress that he made, that I might have the knowledge of what he was doing, and evidence to be used if it should be required, as I believed his inventions would be of very great pecuniary value, and therefore probably litigated, and by reference to these letters I have refreshed my recollection of these subjects."

No letter has been produced giving the slightest detail regarding the results attained with the two membrane instruments, although Mr. Bell stated in his letter of July 1st, that he hoped to try them together the very next day. While, on the other hand, the expressions contained in his letter of August 14th, which will be hereafter quoted, breathe a hope that, "the future will discover means of utilizing currents obtained in this way," and the belief that, "*when* we can create a pulsatory action of the current which is the *exact equivalent* of the aerial impulses, we shall certainly obtain exactly similar results," while the shrewd suggestion is made regarding the magneto-electric current that," In its present undeveloped state, it might be unwise to let Gray know anything about it, unless, indeed, we could secure the *principle* of it in a patent."

The most creditable explanation of this remarkable silence is that "the results were unsatisfactory and discouraging," and that any letters detailing them were better left unwritten.

Again, Mr. Bell produced (C. Vol. 1, pp. 152–4) rough drafts of some of the claims he originally drew in October, 1875, in preparing the specification for his patent of March 7, 1876. Among them were the following:

"3. The phono-telegraph, whereby two or more vocal or other sounds, differing in pitch, loudness and *timbre*, can be transmitted singly or simultaneously along a single wire, by causing electrical undulations upon the wire, similar in *form* to the aerial vibrations accompanying said vocal or other sounds."

"6. The method of and apparatus for transmitting simultaneously sounds differing in '*timbre*' as well as in pitch and loudness."

"3. The phono-telegraph, whereby the exact pitch, loudness and *timbre* of vocal or other sounds can be transmitted telegraphically, by causing the body by whose motion undulations are induced upon the line wire to copy exactly the aerial vibrations accompanying said vocal or other sounds, and hence to induce upon the line wire electrical undulations similar in *form* to those occurring in the air."

These were expressions directly in accordance with his *theory* of the operation of the magneto-electric current; but in the final draft of his specification, all reference to the transmission of the *timbre* of a sound was omitted. Had he actually succeeded in transmitting the *timbre* or quality of a sound (which is the essential characteristic of articulate speech) it is inconceivable that he should have omitted all reference to this crowning excellence in both specification and claim.

Other circumstances might be mentioned, such as the cessation for months of all experimental labor, the discharge of Mr. Watson, etc., which indicated a "discouraging" rather than inspiriting state of affairs, but we must be content with the citation of an additional bit of testimony given by Mr. Watson in the *Dowd* case (C. Vol. 1, page 205):

"Int. 24. Have you tried to transmit articulate speech with the instruments, Exhibits 19, 20, 21, 22, and 23? If so, state when, where and how, and with what results. A. I have. On Saturday July 5, 1879, I tried the membrane telephones Exhibits 19 and 22 on a line between two parts of the building, 40 State street, with the circuit arranged as in Mr. Cross' third answer, using the sheep skin diaphragms Exhibits 20 and 23, and the heavy armatures Exhibit 21 and another one like it, which I now produce. I carried on conversation with Prof. Bell successfully, using three cells bichromate battery, the same that Mr. Cross described.

"On Monday, July 7th, I placed the instruments in circuit between the attic and third story of Mr. Williams' manufactory, under almost precisely the same conditions as the experiment of June 2, 1875. I could hear occasionally very faint sounds. The battery used was two large bichromate cells. We then carried the instruments to 40 State street, and tested them again on the same circuit as on the 5th with as good results as obtained that day."

"Int. 25. Please state how the results which you obtained in the trials just mentioned compare with the results obtained in the trials of June and July, 1875. If there is any difference, state what, in your opinion, is the cause of it? Ans. In the experiment of July 7, 1879, at Mr. Williams' workshop, I do not think the results were any better, if as good, as those obtained in June or July, 1875, but the results obtained at 40 State street, on July 5, 7 and 9, 1879, were decidedly better. The reason why the results were better at 40 State street is, in my opinion, due to the fact that we were in a very quiet place, and that we were more practiced in listening for faint sounds than in 1875."

It thus appears that in 1879, at the trial of certain instruments in a particular location, Mr. Watson "could hear occasionally very faint sounds," and this performance is made by him a standard of comparison, by which he is enabled, incidentally, to inform us as to the effects actually observed by him in June and July, 1879.

He says with charming ingenuousness, "I do not think the results were any better, if as good, as those obtained in June or July, 1875."

But these results were simply hearing, not words, but *occasionally very faint sounds.*

The mind is inevitably led, under the circumstances, to the natural conclusion that in making this comparison no *marked* difference in the results was perceptible to Mr. Watson, and that the effects perceived were, in fact, substantially similar in the two cases.

XVI.

We are now called upon to meet the very problem that was then presented to Mr. Bell.

He had ceased all further experimental work, as shown by his testimony. (C. Vol. 2, page 1581.)

Cross-Q. 297. You state in your last answer that 'few, if any, experiments of any kind were made between the end of July and the date of the patent.' I judge from that statement that you can not remember of any experiments having been made between the end of July and the date of the patent; am I correct? *Ans.* Yes."

The great excitement he had undergone, the intense thought and the severe application given to his work, together with the alternations of hope and disappointment had made him sick, and Mr. Watson as well:

"Then came the experiments of June 2, 1875. This was followed by a period of great excitement over the speaking telephone—a period of constant experiment and sleepless nights. During this period my mind was also much worried by domestic matters and by pecuniary distress; and all these things combined led to a complete breakdown of my health about the end of July or the commencement of August." (C. Vol. 2, page 1663. Ans. 521.)

"About the end of July, the experiments were suspended on account of the illness of Mr. Watson, and when he had recovered I was in no condition to resume work. By about the commencement of August my health had completely broken down, and during that month I hardly left Salem, excepting for an occasional visit to Mr. Hubbard's house in Cambridge. I made no experiments during this month, but occupied my time in thinking and pondering over the experiments that had been made in the preceding months. About the end of August or the first of September I left Salem for my father's house in Canada."

In thus thinking and pondering over the subject, the question naturally arose: What could he do under the circumstances to profit by the occasion?

To justly apprehend the situation, let us glance over the past, in the briefest possible *resume*, of the history down to this point.

Mr. Bell's attention had been directed at an early date to the great problem of the electrical transmission of speech.

In November, 1873, by the study of an article upon "The Acoustic Telegraph" he had acquired a knowledge of what had been accomplished by his predecessors in this direction and of the underlying and fundamental principle through the application of which the solution was to be sought. This was, that sound was to be reproduced at a distance in a receiver by electrically reproducing in that receiver the identical vibrations imposed by the original sound upon the transmitter. In 1874 he was led to the clear apprehension that the making and breaking of the circuit, effected by the transmitters previously employed, was only the first step toward the practical development of that great principle, inasmuch as its power was limited to the production of vibrations in the receiver which corresponded only in rate of succession to the vibrations in the transmitter, thus reproducing a sound in the single quality of pitch alone.

He then formed the brilliant conception that by effecting an arrangement of the armature in the transmitter, so that it should vibrate in front of its electro-magnet in exact correspondence with the air vibrations produced by a sound, these vibrations would, by their movement, induce upon the circuit the flowing of a vibratory current, which would correspond in its oscillations exactly to the vibrations of the armature, and consequently to the aerial impulses produced by the sound.

The rate of the oscillations in this current would correspond to the rate of the vibration of the armature, and consequently to the pitch of the sound; the intensity of each electrical impulse would vary directly with the amplitude of the vibration of the armature,* so that it must likewise correspond to the loudness of the sound; while the polarity or direction of the electrical impulse would correspond exactly to the direction of the motion of the armature in its vibration, and hence to the alternate condensations and rarefactions constituting the aerial sound-wave movement.

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* For the rate of this vibration fixes the definite time within which each single vibration is performed, and the greater the amplitude passed through during this time, the greater is the motion of the armature and the more intense the electrical impulse produced.

The "make and break" current previously employed passed, in its operation, through, only one phase of variation, to wit: variation in the rate of succession of the electrical impulses, these impulses varying neither in their intensity, nor in their polarity or direction of movement.

But on the other hand, and in severe contrast, here was a current which, by a fundamental law of electricity, *must* always correspond exactly in every phase of its charge with the variations taking place in the movement of the vibrating armature which is inducing it. Every irregularity and every intricacy of that movement, whatever be its cause or origin, *must* produce a strictly corresponding variation in the current which that very movement is at the instant in the act of generating or causing.

The clear apprehension of this fact, or law of electricity convinced Mr. Bell, *per force* that this current, thus produced, was precisely the instrumentality which would do the work, could it but be made available for the purpose.

The great PRINCIPLE which he then conceived was, the transmission of speech by the generation of this current by the vibrations of an armature corresponding exactly to the air vibrations accompanying the sound.

Could this principle be actually embodied in an apparatus which should strictly fulfill these conditions, its "mode of operation" would be such that, theoretically, *speech must be transmitted.*

There were, obviously, two practical conditions, both necessarily involved in the very conception of the possible embodiment of that principle in a working apparatus.

First. The construction and arrangement of the armature must be such that its vibrations would, in deed and in truth, be actually similar in form to the vibrations of the air accompanying the sound, as otherwise the *quality* of the sound would be lost, speech would not be reproduced, and there would be no actual embodiment of the principle in a material form.

Second. The metallic armature must be of such size, form and density that these very vibrations would induce or cause electrical impulses of sufficient power to produce audible vibrations in the receiving armature, as otherwise the apparatus would be useless for any practical purpose.

The happy accident of June 2, revealing to Mr. Bell the fact that mechanically vibrated armatures could induce electrical impulses strong enough to set a receiving armature into audible vibration, convinced him that the accomplishment of the second of the above mentioned conditions was within the range of possibility and the legitimate hope of attainment.

In regard to the fulfillment of the first condition, he says (C. Vol. IV, Exhibits page 1008):

> "My mind immediately recurred to the use of a membrane as a means of operating an armature *so as to correspond to the vibrations of the air* caused by vocal sounds, and either on the same day, or shortly after, I gave orders for the construction of two instruments in which the armature of an electro-magnet should be moved by the vibrations of a stretched membrane, to which it was connected."

The instruments were constructed, but to his disappointment they proved, as we have seen, to be an utter failure in the transmission of speech. The armature neither vibrated "so as to correspond to the vibrations of the air caused by "vocal sounds," nor produced electrical undulations "similar in form to the vibrations of the air accompanying the "said vocal or other sounds."

The *principle* had not been given an embodiment in a practical or working apparatus. The great problem of the actual transmission of speech electrically had not been solved. The world was not yet possessed of a telephone capable of transmitting, however feebly, even a single word of articulate speech.

At the very best test that he could afterwards report, the most noticable results he could mention were that he, Mr. Bell himself, heard nothing, while Mr. Watson heard a faint sound. Or, to give Mr. Bell the benefit of the most favorable statement he made to Mr. George Brown the day he procured his signature to the contract. "The varying pitch of the voice could be discriminated, but not the quality. A sort of muttering effect was perceived at the receiving end when a person talked very loudly at the other end."

This was the most that Mr. Bell and Mr. Watson had been able to accomplish after two months of the severest application, during "a period of constant experiment and sleepless nights."

His efforts exhausted, he abandoned all further attempt for the present, if that is the meaning of his discharge of Mr. Watson and his cessation from all experiments during the succeeding months, and until after his return from Washington in March, 1876, and, looking over the whole ground, he sought diligently for something that could be saved from the failure.

Thinking and pondering over the matter he finally concluded that, inasmuch as Mr. Watson had been able to hear a faint sound, of which the pitch could be discriminated, but unfortunately not the quality, the essential characteristic of speech, there were yet further possibilities in store in the future, and that the production of this magneto-electric current was simply the key to still greater things.

He was convinced that his *theory* was correct and that his *principle* was a right one; that, while he had utterly failed to embody that principle in a working apparatus which would transmit speech, although through no fault of his own, but because of the inherent difficulties involved in the practical problem, the *future* might discover means of utilizing this current in actual service through any distance and from place to place. He felt absolutely sure that, when means should be discovered, which in their operation would actually produce a pulsatory action of the current in exact equivalency of the aerial impulses, there would certainly be obtained exactly similar results.

In this full confidence, he then and there determined to forestall the future, and to patent the *principle*, so that hereafter, should any rival succeed where he had failed, he could appropriate to himself the fruits of that success, *by* *virtue of a superior right.* This was the purpose upon which he finally resolved, and which he has plainly and unmistakably *avowed* in his own testimony. (C. Vol. II, page 1674.)

"Q. 561. You say that you occupied your time in thinking and pondering over your experiments; if you had any paper written during that month of August, 1875, which expresses your state of mind and your conclusions from all that you had thought and done up to that time, upon the subject of your invention, set forth in your patent of March 7, 1876, will you please read it? Ans. On the 14th of August, 1875, I wrote to Mr. Hubbard the following letter, which is already in evidence and printed as part of my answer 94, page 147.

"SALEM, MASS., August 14, 1875.

"*Dear Mr. Hubbard:*

"On glancing back over the line of electrical experiments, I recognize that the discovery of the magneto-electric current generated by the vibration of the armature of an electro-magnet in front of one of the poles, is the most important point yet reached. I believe that it is the key to still greater things. The effects produced, though slight in themselves, appear to me so great in proportion to their cause that I feel sure that the future will discover means of utilizing currents obtained in this way on actual telegraph lines.

"So important does it seem to me to protect the idea, that I think some steps should be taken immediately toward obtaining a caveat or patent for the use of a magneto-electric current, whether obtained in the way stated above, (by the vibration of permanent magnets in front of electro-magnets,) or in any other way. I should wish to protect it specially as a means of transmitting, simultaneously, musical notes differing in *intensity* as well as in pitch.

"I can see clearly that the magneto-electric current will not only permit of the actual copying of *spoken utterance*, but of the simultaneous transmission of *any* number of musical notes (hence messages) without confusion.

"The more I think of it the more I see that the method of making and breaking contact so many times per second, is only the *first stage* in the development of the idea.

"When we create a pulsatory action of the current, which is the *exact equivalent* of the aerial impulses, we shall certainly obtain *exactly similar* results. *Any number of sounds* can travel through the same air without confusion and any number should pass along the same wire.

"It should even be possible for a number of spoken messages to traverse the same circuit simultaneously, for an attentive ear can distinguish one voice from another, although a number are speaking together.

"Don't you think it would be well to take out a *caveat* for the use of the magneto-electric current?

"In its present undeveloped state, it might be unwise to let Gray know anything about it, unless, indeed, we could secure the *principle* of it in a patent.

"Yours respectfully,
"A. GRAHAM BELL.

"GARDINER G. HUBBARD, Esq., Cambridge."

We are now met, as before stated, by the very problem which was then presented to Mr. Bell. Shall we approve his decision? Did he act wisely in thus ceasing all further effort toward the actual embodiment of his great principle in a material form, leaving the future to discover the means which might effect its utilization, and devoting his great intellectual abilities to the task of effectually patenting that principal, that he might thereby secure to himself the exclusive right to its practical working?

Or, on the other hand, should he have refrained from entering the patent office, except possibly by a caveat, until the succeeding year, when the requisite means had at last been discovered and applied, as set forth in his second patent?

Patents are authorized only for inventions, not for scientific theories, or for unembodied principles. They are granted for the actual, not the ideal; for the substance of things hoped for, not the promise. They are provided as a reward for difficulties actually overcome, not put over into the lap of the future; as a stimulus to untiring effort, not as an encouragement to ease; to promote the progress of the useful arts, not to hinder their development.

The law is stern and inflexible, guarding jealously the rights of the public against all undue encroachment.

A *monopoly*, whatever its character, is, in a sense, repugnant to the instincts of a free people, and it can only be lawfully gained by giving to the public, as a *quid pro quo*, a *useful* art, machine, manufacture or composition of matter, or a new and *useful* improvement thereof. Was Mr. Bell, as matter of fact, then in a condition to pay to the public this price for the monopoly he sought?

Had he within his possession the art of the transmission of speech by electricity?

Had he even the information how to transmit speech by electricity?

Could he tell others how to do it, when the difficulties encountered had been so great that he himself, and Mr. Watson also, had both utterly failed, notwithstanding their admirable equipment for the task?

Could he describe this new and useful art "in such full, clear, concise and exact terms" as to enable any person skilled in any art or science, or in any number of arts or sciences, to construct an apparatus which would transmit speech electrically, without the necessity of making further experiment, research of invention?

The remarkable fact is developed in his testimony that, confessedly, he did not even attempt to make any actual portrayal of his apparatus in his patent, but avoided, as far as possible, giving expression to any mechanical details of construction, a course, indeed, that was naturally to be expected, for he could not give what he did not possess, and what he did possess he had found to be defective and inadequate.

He stated in answer to Cross-Q. 392 (C. Vol. 2, p. 1620,) that:

"Figs. 5 and 6 do not pretend to show the full construction of the apparatus, but are simply electrical diagrams."

"Cross-Q. 395. Is Fig. 7 of that patent, like Figs. 5 and 6, only an electrical diagram? Ans. Certainly."

"Cross-Q. 608. (*Ibid*. p. 1696.) Please explain exactly what you mean by the expression 'electrical diagrams' which you have used several times in your testimony? Ans. A diagram that would illustrate the general electrical arrangements described in the specification, and that did not profess to be exact drawings of the apparatus, or even to show many of the mechanical details of construction."

Mr. Watson also testified as follows (C. Vol. I, page 325):

"Cross-Int. 239. The apparatus represented in Fig. 7 of Bell's first patent was not made till some time after the original instruments of which Exhibits 19 and 22 purport to be duplicates, was it? Ans. Fig. 7 I consider merely as a diagram of the original instrument made in June and July, 1875.

"Cross-Int. 240. Do you mean that prior to March 7, 1876, there was no apparatus made of which Fig. 7 would be an exact representation? Ans. I know of none.

"Cross-Int. 241. If such an apparatus was made, then I suppose you do not know why all means of adjusting the armatures relatively to the poles of the magnet were omitted from it, do you? Ans. I know of no reason why it should have been."

Turning now to the specification of the patent we find that barely four lines of that lengthy specification, and no more, are devoted to the "full, clear, concise and exact" description he then gave to the world, of the *construction* of an apparatus which would transmit speech by electricity. The passage is certainly unique in its brevity in the history of patents, and if descriptive passages ever rise to the distinction of being word pictures, this one might fairly be pronounced an "electrical diagram" in silhouette. The passage is as follows:

"The armature *c*, Figure 7, is fastened loosely by one extremity to the uncovered leg, *d*, of the electro-magnet *b*, and its other extremity is attached to the center of a stretched membrane *a*. A cone A, is used to converge sound vibrations upon the membrane."

This is all the information afforded in the patent as to the construction of the apparatus; but is this the *full*, the *clear*, the *exact* description demanded by the law?

Indeed, in the last analysis, this "electrical diagram" and the four lines explaining it, amount to nothing more nor less than a *theoretical description* of an apparatus, illustrative of the working of the *principle* set forth in the patent.

In the light of the testimony given by Mr. Bell and Mr. Watson it clearly appears that there was not even a pretense made of the representation, definitely, of the actual construction which would transmit speech.

But might not these four lines of description and the electrical diagram accompanying them enable the skilled artisan to make an apparatus which would transmit speech "from the information contained in the specification," and by the exercise of ordinary mechanical skill and without further directions or experiment?

Mr. Bell knew better.

He simply places the reader of that patent exactly where he had placed Mr. Watson on June 2, 1875, when he gave him like instructions as to how to make the instrument. Could he legitimately expect the reader to succeed any better than did Mr. Watson in like case, or than did he and Mr. Watson together, when they had passed through two months of laborious days and sleepless nights, without accomplishing the task?

Had he the confidence to believe that the practical difficulty they had *perforce* left unsolved could be solved by the reader, without experiment, and without research or invention?

Mr. Bell had turned away from a practical difficulty only to encounter a legal one even more formidable.

To secure the monopoly he desired, it was under the law essential, indeed *indispensable*, that he should describe in his specification the construction of an apparatus which would transmit speech. The difficulty was to describe such an apparatus, when he, himself, knew not how to make it, nor had yet discovered the essentials of construction which would characterize the successful as distinguished from the unsuccessful apparatus.

The two difficulties, the practical and the legal, were indissolubly united. The "new art" could only be created by overcoming the practical difficulty, while the means of overcoming that difficulty could only be "exactly" described by one who had the requisite knowledge.

The rule found no exception in this case.

It is true that the patent contains what Mr. Bell and Mr. Watson have both pronounced to be an electrical diagram, thus ascribing to it an unlimited flexibility, and also general terms descriptive of construction.

It is equally true that Mr. Bell and Mr. Watson constructed an apparatus in strict conformity with the terms of that description, and that, from time to time, they made various experimental changes in the details of the construction of that apparatus, all, however, included within those general descriptive terms, and that, nevertheless, they utterly failed to make that apparatus available for the transmission of even a single word of speech. A multitude of such forms of apparatus might be made, all in conformity with the terms of that description and with every word applicable, and yet not one of them be available for the transmission of speech, though all were made in good faith and with intent to accomplish the work.

What is the defect in the description, and wherein is it so inexact?

The answer is found in the plain fact that the patent does *not* point out the distinguishing characteristics of the construction of a successfully working apparatus, in contra-distinction from the vast array of constructions conforming literally to the terms of the general description, but wholly unavailable for the electrical transmission of speech.

This was precisely the information that Mr. Bell and Mr. Watson had so long and diligently sought and in vain, and it was this that Mr. Bell had been compelled to leave to the future to discover.

The fact that Mr. Bell, Mr. Watson and others were able to talk through alleged reproductions of the original 1875 instruments constructed "from memory and judgment," * at a later period in the history, in 1879, after these discoveries had been made, when the telephone through subsequent inventions had become a useful art, and the laws of its successful construction thoroughly understood, by no means proves that speech was transmitted through the original instruments in 1875; for the contrary is established beyond controversy. Nor does it prove that those instruments actually possessed the essential and distinguishing characteristics of a successfully working apparatus; for that would be to ascribe both to Mr. Bell and Mr. Watson a monumental stupidity if, in fact, they had instruments with which it was only necessary to speak into the transmitter that words might be heard from the receiver, and yet they passed wearisome days and sleepless nights, and made themselves both sick in the vain effort to do this very thing. Nor does it write into the patent the information there omitted, because it had not yet been discovered.

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* C. Vol. I, page 328; Watson *Cross-Int.* 259.

The inconclusive character of all such testimony is due directly to the fact that the human mind is so constituted that memory and judgment are unconsciously and inevitably informed both by present knowledge and recent experience, and, to use an expressive bit of slang, because "hindsight is better than foresight."

Incidently, it may be remarked that Mr. Bell, in his anxiety to "secure the principle" in his patent, even withheld from the public the information he must have gained from the experience of nearly two months of daily experiment with the various parts of his apparatus, information as to the preferable size and weight of the armature, the thickness of the membrane and the proportions which would prevent the armature from being torn from the membrane, etc., leaving all these matters to be rediscovered, by renewed experiment, should any one attempt the construction of the apparatus.

In a word, Mr. Bell had certainly conceived of a great *principle* or theoretical mode of operation for the transmission of speech by electricity.

He had, as certainly, failed to embody that principle in a practical working apparatus. Certain practical difficulties had been encountered which had effectually prevented the transmission of even a single word of speech.

The principal difficulty thus encountered, was of the most serious character. It was fundamental, and its resolution was indeed integral with the solution of the problem of the practical transmission of speech.

Mr. Bell had found it impossible, as yet, to construct an armature and so combine it in an apparatus that its vibrations should actually correspond to the air vibrations accompanying a sound, or, in the language of his patent, so that it should cause "electrical undulations similar in form to the vibrations of the air accompanying the said vocal or other sounds."

But notwithstanding this acknowledged failure, Mr. Bell, nevertheless, determined to patent the *principle*, leaving to the future to discover the means for utilizing it.

But as Mr. Bell had been unable to devise means which would overcome these difficulties, so now he was unable to describe such means in his patent, and, indeed, as we have seen, he did not even make the attempt.

The issue is plainly drawn:

Could Mr. Bell, under the circumstances then existing, lawfully claim, and thereby under the law secure to himself, as his absolute right, "The method of and apparatus for transmitting vocal or other sounds telegraphically," "by causing electrical undulations similar in form to the vibrations of the air accompanying the said vocal or other sounds," whatever be the apparatus employed, provided only that it actually embodies this principle or mode of operation?

The issue is one of law to be decided under the bearing of precedents and authorities, which it is not the province of this paper to discuss.* It is an issue of surpassing import-

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* A few citations from the authorities are given, without comment, where the statements of the law seem peculiarly apposite to the facts in this case.

At the Circuit, his Honor, Judge Shipman, in *Morton* v. *New York Eye Infirmary*, 5 Blatch. 121, stated the distinctions made by the law in clear terms, as follows:

"In its naked, ordinary sense, a discovery is not patentable A discovery of a new principle, force or law, operating, or which can be made to operate, on matter, will not entitle the discoverer to a patent. It is only where the explorer has gone beyond the mere domain of discovery and has laid hold of the new principle, force or law, and connected it with some particular medium or mechanical contrivance, by which, or through which, it acts on the material world, that he can secure the exclusive control of it under the Patent Act. He ance, and it is interesting alike to the advocate, to the court, and, in its decision, to the historian and to succeeding generations. Whatever be the decision, the peculiar significance of the facts involved, the definite issue, and the im-

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then controls his discovery through the means by which he has brought it into practical action, or their equivalent, and only through them. It is then an invention, although it embraces a discovery. Sever the force or principle discovered from the means or mechanism through which he has brought it into the domain of invention, and it immediately falls out of that domain and eludes his grasp. It is then a naked discovery, and not an invention."

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"Every invention may, in a certain sense, embrace more or less of discovery, for it must always include something that is new; but it by no means follows that every discovery is an invention. It may be the *soul* of an invention, but it can not be the subject of the exclusive control of the patentee, or of the patent law, until it inhabits a *body*, any more than a disembodied spirit can be subjected to the control of human laws." * * * *

"A discovery may be brilliant and useful, and not patentable. No matter through what long, solitary vigils, or by what importunate efforts the secret may have been wrung from the bosom of nature, or to what useful purposes it may be applied. Something more is necessary. The new force or principle brought to light must be embodied and set to work, and can be patented only in connection or combination with the means by which, or the medium through which it operates."

In *Burrall* v. *Jewett*, 2 Paige, 143, Chancellor Walworth enunciated the law applicable to such cases concisely, as follows: "The patent is void if the machine will not answer the purpose for which it was intended without some addition, adjustment or alteration which the mechanic who is to construct it must introduce of his own invention, and which had not been invented or discovered by the patentee at the time his patent was issued."

The rule of law has been established by this court as follows:

"The settled rule of law is, that whoever first perfects a machine is entitled to the patent, and is the real inventor, although others may have previously had the idea and made some experiments toward putting it in practice. He is the inventor and is entitled to the patent who first brought the machine to perfection, and made it capable of useful operation."

Agawam Company v. *Jordan*, 7 Wall. 602, and *Whitely* v. *Swayne*, *Id.* 687.

"Original and first inventors are entitled to the benefit of their inventions if they reduce the same to practice, and seasonably comply with the requirements of the Patent Law in procuring letters patent for the protection of their exclusive rights. Crude and imperfect experiments are not sufficient to confer a right to a patent; but, in order to constitute an invention, the party must have proceeded so far as to have reduced his idea to practice, and embodied it in some distinct form." * * * "He is the first inventor in the sense of the Patent Law, and entitled to a patent for his invention, who first perfected and adapted the same to use; and *it is well settled that until the invention is so perfected and adapted to use it is not patentable under the patent laws.*"

Seymour v. *Osborne*, 11 Wall. 552.

See also

O'Reilly vs. Morse 15 How.

Burr vs. Duryea 1 Wall.

portance of the case will make it a landmark in the patent law for all time to come, and future inventors, under similar circumstances, will ever be guided in their course by the law which shall be established in this case.

XVII.

A second and wholly distinct issue is also involved in this case.

Granting their validity, what construction shall be given to Letters Patent No. 147,469, granted to Mr. Bell, March 7, 1876, and in particular to the fifth claim?

While this is a purely legal question, to be determined by an analysis of the terms of the patent, it yet falls within the trend of the historical development of Mr. Bell's work.

In the previous portion of this paper we have endeavored to utilize the materials afforded in complainant's record, in tracing the actual history of the development of Mr. Bell's conception of a method of, and an apparatus for, the electrical transmission of speech.

This conception found its ultimate expression in the specification of the patent.

A study, therefore, of the previous history of that conception, from its first inception to its final development into a perfect theory and a definite principle, should contribute aid toward the intelligent comprehension of that patent.

Mr. Bell has stated (C. 2, page 1674, Ans. 560):

"I made no experiments during this month (August, 1875), but occupied my time in thinking and pondering over the experiments that had been made in the preceding months. About the end of August or the first of September, I left Salem for my father's house in Canada.

Q. 561. You say you occupied your time in thinking and pondering over your experiments; if you have any paper written during that month of August, 1875, which expresses your state of mind and your conclusions from all that you had thought and done up to that time, upon the subject of the invention set forth in your patent of March 7, 1876, will you please read it? Ans. On the 14th of August, 1875, I wrote the following letter, which is already in evidence, and printed as part of my answer 94, page 147." (Here follows the letter, which has already been quoted *ante*, page)

This letter of August 14, 1875, written under the circumstances described, is a pivotal fact in the record.

After much thought and reflection, Mr. Bell, "glancing back over the line of electrical experiments," comes to a definite conclusion as to their results. He recognizes that "the discovery of the magneto-electric current generated by the vibration of an electro-magnet in front of one of the poles, is the most important point yet reached." So important did it seem to him "to protect the idea," that he declared in favor of immediately "obtaining a caveat or patent for the use of a magneto-electric current, whether obtained in the way stated above (by the vibration of permanent magnets in front of electro-magnets) or in any other way." "When we can create a pulsatory action of the current which is the *exact equivalent* of the ærial impulses, we shall certainly obtain exactly similar results." "Don't you think it would be well to take out a *caveat* for the use of the magneto-electric current? In its present undeveloped state, it might be unwise to let Gray know anything about it, unless, indeed, we could secure the *principle* of it in a patent." (The italics are Mr. Bell's.)

This letter is important, because it is introduced, avowedly as an expression by Mr. Bell of his "state of mind" at that time, and of the "conclusions" drawn by him from all that he had thought and done up to that time upon the subject set forth in the patent of March 7, 1876.

It is of even greater value as an explicit statement, made by Mr. Bell, of the purpose with which he entered upon the preparation of the specification for that patent. He would take steps immediately toward obtaining a patent "for the use of a magneto-electric current." He would secure the *principle* of it in a patent. This letter is, therefore, in the broad sense of the word, a "key" to that specification, and by its application all will be found to be opened clearly to our understanding.

Tracing the development of the specification historically, we find (C. Vol. 2, page 1676) that Mr. Bell commenced work upon it in September, 1875, during his visit to Canada.

Upon his return, about the first of October, and during that month, he occupied himself in "writing and rewriting" this specification.

It also appears that during that visit to Canada, Mr. Bell entered into negotiation with Mr. George Brown and his brother, of Toronto, with reference to their taking out foreign patents upon his inventions, in return for an interest in the same, and that a contract to this effect was concluded December 29, 1875,

In pursuance of this contract, Mr. Brown left for England about the last week in January, taking with him a copy of the specification as then prepared, which copy has since been produced in evidence. The record reads as follows (C. 2, page 1682):

"Q. 567. About when did Mr. George Brown go to England? Ans. About the last week in January, 1876.

"Q. 568. Did he take with him a specification furnished by you, corresponding to the specification of your patent of March 7, 1876? Ans. He did.

"Q. 569. Please look at the paper now shown you, and state whether it is the specification which you furnished to Mr. George Brown? Ans. It is.

"[Complainants' counsel puts a copy of the paper in evidence to be marked Complainants' Exhibit, George Brown Specification.]

"Q. 570. How long before Mr. George Brown sailed for England did you deliver this paper to him? Ans. I only know that it was handed to him between the date cf the agreement, December 29, 1875, and the time he sailed—the latter part of January, 1876.

"Q. 571. When was this paper written? Ans. In October, 1875.

"Q. 572. I observe that it is headed "United States Patent Office," from which I infer that this particular paper was originally prepared for your American specification, and not for the purpose of being handed to Mr. George Brown; what is the fact about that? Ans. Certainly; that is the fact.

"Q. 573. Did you at or about the time when you handed this paper to Mr. George Brown, also give to him descriptions of your other electrical inventions, patented and unpatented? Ans. Yes.

"Q. 574. Are these six papers, which I now show you, the ones referred to in the last question and answer? (Objected to as immaterial and irrelevant.) Ans. Yes.

"Q. 575. Will you please offer them to the defendants' counsel for his inspection, if he desires to look at them? Ans. I do so now.

"Q. 576. In the Exhibit George Brown Specification there are some alterations made by drawing the pen through words or phrases, and interlining others in place of them. What is your recollection as to when those changes were made? Ans. I have not any clear recollection of the time when these changes were made, excepting that they were made before the specification was given to Mr. Brown."

"Q. 585. You have told me this morning that you wanted to make some addition to your answer to interrogatory 571; please do so? Ans. Yes; I desire to state that though from the language used in this paper I know that it is a copy of the specification as I wrote it in October, 1875, I can not be perfectly certain that the copy was itself made in October, 1875, although it is my belief that it was. It was made as a fair copy not in my handwriting. The interlineations and corrections are in my own handwriting."

Inasmuch as the "George Brown Specification" (C. Vol. 4 Exhibits, page 936) is a copy of the original specification as it existed at one stage of its history, before it was filed in the patent office, it merits a most careful consideration, as it may aid materially toward obtaining a correct understanding of the specification as it finally appears in the patent.

It will be found, upon examination, not only to be in entire accord with the tenor of the whole previous history of the invention, but that the "key" to its understanding, given by Mr. Bell in his letter of August 14, fits the lock perfectly in every detail.

Subjecting this specification to the simplest analysis, we first find it entitled as follows:

"To all whom it may concern, be it known, that I, Alexander Graham Bell, of Salem, Massachusetts, have invented certain new and useful improvements in telegraphy, of which the following is a specification:"

This apparent limitation of the subject to "telegraphy" may however be justly and fairly ignored, in view of the much broader statement of the invention given in the body of the specification.

The substance or the essential nature of the invention is there stated as follows:

"My present invention consists in the employment of a vibratory or undulatory current of electricity in place of a merely intermittent one; and of a method of, and apparatus for, producing electrical undulations upon the line wire."

It is true, however, that "the employment of a vibratory or undulatory current of electricity" and of "a method of, and apparatus for, producing electrical undulations" is described in the specification principally in its application to purposes of multiple telegraphy, and only incidentally in its application to the purpose of the transmission of vocal and other sounds.

This incidental application, however, can not be ignored, inasmuch as the fifth claim appears by its terms to be especially based upon that application.

By way of introduction and with especial reference to the intended application of his invention to purposes of multiple telegraphy, Mr. Bell makes reference to a preceding patent as follows:

In letters patent granted to me I have described a method of, and apparatus for, transmitting two or more telegraphic signals simultaneously along a single wire by the employment of transmitting instruments, each of which occasions a succession of electrical impulses differing in rate from the others; and of receiving instruments, each tuned to a pitch at which it will be put in vibration to produce its fundamental tone by one only of the transmitting instruments; and of vibrating circuit breakers operating to convert the vibratory movement of the receiving instrument into a permanent make or break (as the case may be) of a local circuit in which is placed a Morse sounder register, or other telegraphic apparatus. I have also therein described a form of autograph telegraph based upon the action of the above mentioned instruments.

"In illustration of my method of multiple telegraphy I have shown, in the patent aforesaid, as one form of transmitting instrument, an electro-magnet, having a steel spring armature, which is kept in vibration by the action of a local battery. This armature in vibrating makes and breaks the main circuit, producing an intermittent current upon the line wire. I have found, however, that upon this plan the limit to the number of signals that can be sent simultaneously making and breaking the same circuit, the effect upon the main line is practically equivalent to one continuous current."

He then states the advantages to be derived from the use of this current for purposes of multiple telegraphy, as follows:

"The advantages I claim to derive from the use of an undulatory current in place of a merely intermittent one are:

"1. That a very much larger number of signals can be transmitted simultaneously over the same circuit.

"2. That a closed circuit and single main battery may be employed.

"3. That communication in both directions is established without the necessity of using special induction coils.

"4. And that—as the circuit is never broken—a spark arrester becomes unnecessary."

It will be hereafter observed that the terms "undulatory current" and "electrical undulations," which are the characteristic phrases employed by Mr. Bell in the concise statement of the invention given in the body of the specification appear, one or the other of them, in each of the claims.

Mr. Bell undoubtedly recognized the very great imporance, especially in opening up such a new art, of using only such terms as would be clearly understood, and of so defining them as to prevent even the possibility of mistake.

Mr. Bell has, indeed, stated his purpose in this respect in the strongest possible language:

"I wrote and rewrote the specification a number of times, and finally adopted that mode ef expression that seemed to me best to explain my invention, and the relation that one part of it bore to another. (C. Vol. 2, page 1620, Ans. 394).

"It will be understood then that in October, 1875, I was placed in a very serious dilemma. I expected, from day to day to hear from Mr. Geo. Brown, and while waiting I occupied myself in writing and rewriting my specification. I felt that I had made a great invention. That I had invented what is now know as 'The Speaking Telephone.' I tried to embody this in my specification, and to express it in language that should be scientifically accurate and complete, and to the best of my ability I did so.

(C. Vol. 2, page 1678, Ans. 563.)

The terms "undulatory current" and "electrical undulations" were new in the nomenclature of electricty, although the current itself, as the record shows, had been utilized by Wheatstone and others before.

Mr. Bell, therefore, at once proceeds, with intellegent purpose to describe the "undulatory current" and its "undulations" as follows:

"It has long been known that when a permanent magnet is caused to approach the pole of an electro-magnet, a current of electricity is induced in the coils of the latter, and that when it is made to recede, a current of opposite polarity to the first appears upon the wire. When, therefore, a permanent magnet is caused to *vibrate* in front of the pole of an electro-magnet, an undulatory current of electricity is induced in the coils of the electro-magnet, the undulations of which correspond in rate of succession to the vibrations of the magnet, in polarity to the direction of its motion and in intensity to the amplitude of its vibration.

This is an explicit statement, exactly to the effect that the vibrations of a permanent magnet, in front of the pole of an electro-magnet, induces an "undulatory current of electricity," the "undulations" of which have certain characteristics. These "undulations" "correspond in rate of succession to the vibrations of the magnet, in polarity to the direction of its motion, and in intensity to the amplitude of its vibration."

Why, the "undulatory" current thus described is, by its very terms, nothing more nor less than our old acquaintance the "magneto-electric" current; the *principle* and the *use* of which Mr. Bell deemed it so important to patent, when he wrote his letter of August 14th. We find him now, indeed, engaged in the intelligent execution of the very purpose he then indicated.

Fig I

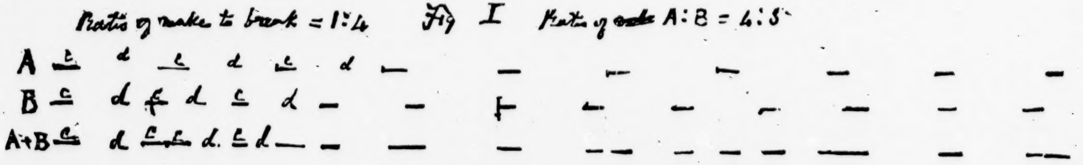

Ratio of make to break = 1:4
Ratio of ~~make~~ A:B = 4:5
A
B
A+B
c
d

Fig II

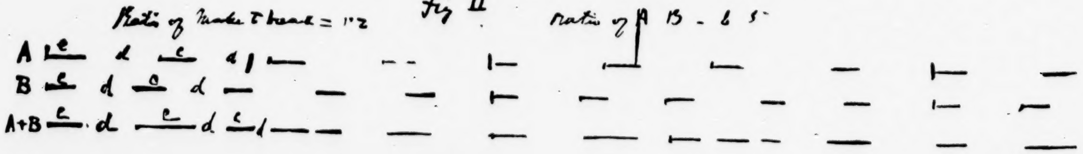
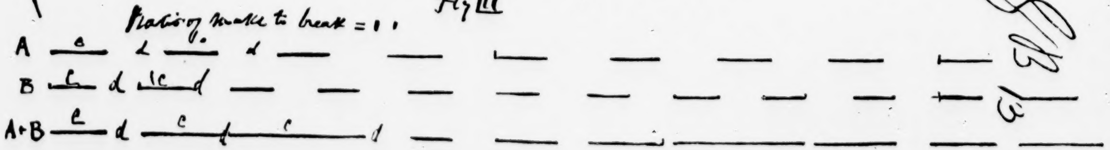

Ratio of make to break = 1:2
ratio of A B = 4 5
A
B
A+B
c
d

Fig III


Ratio of make to break = 1:1
A
B
A+B
c
d

8B13

But Mr. Bell would avoid even the possibility of a mistake. He proceeds, therefore, to further define the undulatory current, by pointing out in unmistakable terms its essential difference from an intermittent current, and he would have this difference clearly understood.

"That the difference between an undulatory and an intermittent current may be more clearly understood. I shall describe the condition of the electric current, when the attempt is made to transmit two musical notes simultaneously; first upon the one plan and then upon the other. Let the interval between the two sounds be a major third. Then their rates of vibration are in the ratio of 4, 5.

"Now, when the intermittent current is used, the circuit is made and broken four times by one transmitting instrument in the same time that five makes and breaks are caused by the other.

"A and B (Fig. I, II, III) represent the intermittent currents produced; four impulses of A being made in the same time as five impulses of B; c, c, c, etc., show where and for how long time the circuit is made, and d, d, d, etc., indicate the duration of the breaks of the circuit.

"The line A and B, shows the total effect upon the current, when the transmitting instruments for A and B are caused simultaneously to make and break the same circuit. The resultant effect depends very much upon the duration of the make relatively to the break. In Fig. I the rate is as 1: 4; in Fig. II, as 1: 2; and in Fig. III, the makes and breaks are of equal duration.

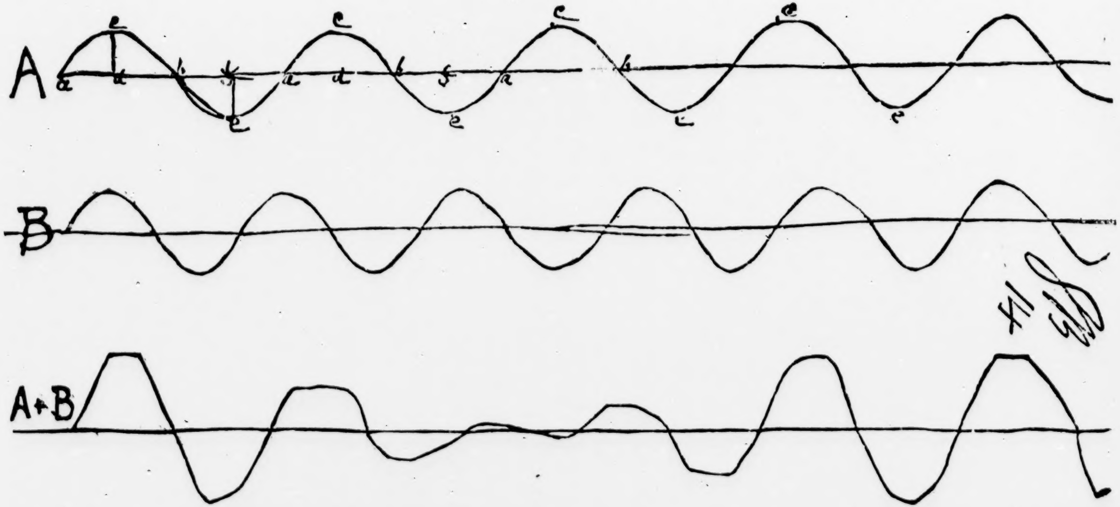
"The combined effect, A and B (Fig. III) is very nearly equivalent to a continuous current.

"When many transmitting instruments of different rates of vibration are simultaneously making and breaking the same circuit, the current upon the main line becomes for all practical purposes continuous.

"Next consider the effect when an undulatory current is employed.

"Electrical undulations induced by the vibration of a body, capable of inductive action can be represented graphically without error by the same sinusoidal curve which expresses the vibration of the inducing body itself, and the effect of its vibration upon the air. For as above stated the rate of oscillation in the electrical current corresponds to the rate of vibration of the inducing body; that is, the pitch of the sound produced. The intensity of the current varies

(Fig IV.)


A
a
d
e
b
e
a
d
e
b
f
a
e
e
b
e
e
B
A+B

with the amplitude of the vibration; that is, with the loudness of the sound, and the polarity of the current corresponds to the directionof the motion of the vibrating body; that is to the condensations and rarefactions of air produced by the vibration. Hence the sinusoidal curve A or B (Fig. IV) represents graphically the electrical undulations induced in a circuit by the vibration of a body capable of inductive action.

"The horizontal line (a, d, b, f) represents the zero of current; the elevations (c, c, c) indicate impulses of positive electricity; the depressions (e, e, e) show impulses of negative electricity; the vertical distance (cd or ef) of any portion of the curve from the zero line expresses the intensity of the positive or negative impulse at the part observed, and the horizontal distance (a, a) indicates the duration of the electrical oscillation.

"The vibrations represented by the sinusoidal curves A and B (Fig. IV) are in the ratio aforesaid, of 4:5—that is, four oscillations of A are made in the same time as five oscillations of B.

"The combined effect of A and B, when induced simultaneously on the same circuit, is expressed by the curve A + B (Fig. IV) which is the algebraical sum of the sinusoidal curves A and B. This curve (A + B) also indicates the actual motion of the air when the two musical notes considered are sounded simultaneously.

"Thus, when electrical undulations of different rates are simultaneously induced in the same circuit, an effect is produced exactly analogous to that occasioned in the air by the vibration of the inducing bodies.

"Hence the co-existence upon a telegraphic circuit of electrical vibrations, of different pitch is manifested—not by the obliteration of the vibratory character of the current, but by peculiarities in the shapes of the electrical undulations; or, in other words, by peculiarities in the shapes of the curves which represent those undulations."

Mr. Bell says:

"Next consider the effect when the undulatory current is employed."

In this discussion every characteristic of this "effect" is attributed directly to the qualities this current possesses by virtue of its origin; in other words, to the qualities of the magneto-electric current.

The reasoning is clear, close and logical. Arranging it in logical sequence it is substantially as follows:

The vibrations of an inducing body produce upon a circuit electrical undulations, or an oscillating current. They also produce sonorous vibrations in the air.

Comparing now the effects upon the circuit with the effects in the air, certain remarkable correspondences are observed.

The rate of oscillation in the electrical current corresponds to the rate of vibration of the inducing body. This rate of oscillation, therefore, corresponds to the rate of the aerial sound vibrations; that is, to the pitch of the sound. The intensity varies with the amplitude of the vibration, and it, therefore, corresponds to the amplitude of the aerial vibrations; that is, to its effect as expressed in the loudness of the sound. The polarity, or direction of the current, corresponds to the direction of the motion of the vibratory body, and it, therefore, corresponds to the direction of the motion in the aerial vibration; that is, to the condensations and rarefactions of air produced by the vibration.

Consequently, the same curve that would represent mathematically the three variations taking place in the current upon the circuit, would also accurately represent the three corresponding variations taking place in the aerial movement.

This curve would also, of course, represent equally the three phases of variation occurring in the motion of the inducing body itself.

The same curve would, therefore, express graphically, and without error, the three phases of variation occurring simultaneously, and in exact correspondence in three different realms, to wit: in the motion of the inducing body itself, in the aerial vibrations set up in the air, and in the electrical undulations caused upon the circuit.

To prevent even the possibility of a mistake he illustrates and describes this curve in examples A and B (Fig. IV).

"The horizontal line (a, d, b, f) represents the zero of currents; the elevations (c, c, c) indicate impulses of positive electricity; the depressions (e, e, e) show impulses of negative electricity; the vertical distance (cd or ef) of any portion of the curve from the zero line expresses the intensity of the positive or negative impulse at the part observed, and the horizontal distance (a, a) indicates the duration of the electrical oscillation."

A definite mathematical meaning is thus impressed upon the curve in its expression of each of the three phases of change occurring, for example, in the current.

The horizontal line represents the zero of current. The polarity of the impulse or electrical undulation at any instant of time is expressed by the position of a point in that curve, at the instant, either above or below the horizontal line, the elevations expressing positive, and the depressions negative impulses. The vertical distance of that point from the horizontal line expresses accurately the relative intensity of the electrical impulse at that instant; while the duration of each electrical impulse is expressed by the horizontal distance along the line occupied in the tracing of the curve of that impulse.

He states thus carefully the mathematical properties of this curve, because the observance of their *mathematical* values is made the very basis of the deductions which follow.

He states that the vibrations represented by the sinusoidal curves A and B, in the examples given, are in the ratio of four to five, as regards the respective rates of oscillation they severally represent.

He then states that "The combined effects of A and B, when induced simultaneously on the same circuit is expressed by the curve A + B (Fig. IV), which is the *algebraic sum* of the sinusoidal curves A and B."

The veriest tyro in mathematics will understand from this statement that the two curves are to be added together, forming a single resultant curve, and that in performing this addition distances from the horizontal line existing in the two curves at any instant of time are to be "algebraically" added; that is, if both distances in the two curves are positive, or above the line, the resultant distance, at the instant, will be above the line and equal to their sum; if both are negative or below the line, the resultant distance will still be equal to their sum, but it will remain negative, and be measured below the line. If at any instant, the distance from the horizontal line is positive in one curve and negative in the other, the less will be subtracted from the greater, and the difference will be the resultant distance to be measured above or below the line, accordingly as the greater distance in the two curves is positive or negative. This resultant curve, therefore, will represent graphically, and with mathematical accuracy, the resultant oscillations or undulations of the current, actually flowing on the circuit, when two sets of undulations are being induced by the simultaneous vibrations of two inductive bodies. Again, "this curve (A + B) also indicates the actual motion of the air when the two musical notes considered, are sounded simultaneously."

Therefore, the effect produced in the current "when electrical undulations of different rates are simultaneously induced in the same circuit" is "exactly analogous to that occasioned in the air by the vibration of the inducing bodies."

But in the air, "the two musical notes considered" are transmitted simultaneously, without interference and without obliteration, through the "resultant" aerial impulses which are represented graphically by the same resultant curve which represents also the effects produced simultaneously in the current.

Hence the co-existence upon a telegraphic circuit of electrical vibrations of different pitch, is manifested not by the obliteration of the vibratory character of the current, but by the peculiarities in the shapes of the electrical undulations; or in other words, by peculiarities in the shapes of the curves which represent those undulations.

A careful study of the previous history of the development of Mr. Bell's conception of the working of the induced magneto-electric current has made this chain of reasoning already familiar and easily comprehended.

The distinctions characteristic of what Mr. Bell here terms the "undulatory current," both as regard its origin and the *modus operandi* of its movement upon the line, Mr. Bell has now made "clearly understood."

The magneto-electric current is the only current which possesses the characteristics embodied in the definitions here given of the "undulatory current," and the magneto-electric impulses alone correspond in their constitution to the essential qualities here attributed to "electrical undulations."

The whole fabric of Mr. Bell's reasoning, by which he has arrived at certain advantageous conclusions, is based directly upon the possession, by the "undulatory" current, of the very qualities which alone characterize the magneto-electric current.

The conclusion is inevitable, from the definitions here given by Mr. Bell, that the "undulatory" current is the magneto-electro-current, induced by the vibration of inductive bodies. But the last lingering doubt, if any exist, is removed by the tenor of the very next sentence in the specification.

"There are many ways of producing undulatory currents of electricity, but all of them depend for effect upon the vibration or motion of bodies capable of inductive action."

Further discussion as to the meaning and intent of the language employed would be puerile.

Mr. Bell's statement that this "present invention consists in the employment of a vibratory or undulatory current of electricity in place of a merely intermittent one; and of a method of and an apparatus for, producing electrical undulations upon the line wire," is thus clearly seen to be a statement made directly in the execution of the purpose he had formed to patent "the use of the magneto-electric-current."

Continuing in the orderly development of the specification, Mr. Bell proceeds to point out generally a few of the methods that may be employed to produce the undulatory current.

"A few of the methods that may be employed I shall here specify.

"When a wire through which a continuous current of electricity is passing is caused to vibrate in the neighborhood of another wire, an undulatory current of electricity is induced in the latter.

"When a cylinder upon which are arranged bar-magnets is made to rotate in front of the pole of an electro-magnet, an undulatory current is induced in the coils of the electro magnet.

"Undulations may also be caused in a continuous voltaic current by the vibration or motion of bodies capable of inductive action, or by the vibration of the conducting wire itself in the neighborhood of such bodies."

Mr. Bell then proceeds to show and describe one particular form of apparatus, in illustration of the method of creating electrical undulations. He explains its mode of operation, and also its application to the purposes of multiple telegraphy, as follows:

"In illustration of the method of creating electrical undulations, I shall show and describe one form of apparatus for producing the effect.

"I prefer to employ for this purpose an electro-magnet (A, Fig. V), having a coil upon only one of its legs. (6.) A steel spring armature (c) is firmly clamped by one extremity to the uncovered leg (d) of the magnet, and its free end is allowed to project above the pole of the covered leg. The armature (c) can be set in vibration in a variety of ways (one of which is by wind), and in vibrating it yields a musical note of a certain definite pitch.

"When the instrument (A) is placed in a voltaic circuit (g, b, e, f, g,) the armature (c) becomes magnetic, and the polarity of its free end is opposed to that of the magnet underneath. So long as the armature (c) remains at rest, no effect is produced upon the voltaic current, but the moment it is set in vibration to produce its musical note a powerful inductive action takes place, and electrical undulations traverse the circuit (g, b, e, f, g.) The vibratory current passing through the coils of the distant electro-magnet (f) causes vibrations in its armature (h) when the armatures (c, h) of the two instruments (A, I) are nominally in unison with one another; but the armature (h) is unaffected by the passage of the undulatory current when the pitches of the two instruments (A, I) are different.

"A number of instruments may be placed upon a telegraphic circuit (as in Fig. VI). When the armature of any

Fig V SB 15

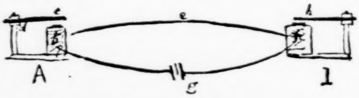


Fig VI

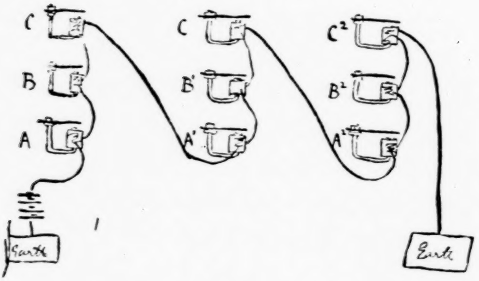
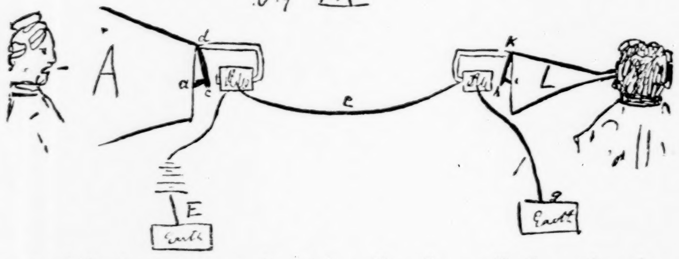


Fig VII



one of the instruments is set in vibration, all the other instruments on the circuit, which are in unison with it, respond, but those which have normally a different rate of vibration remain silent. Thus, if A. (Fig. VI.) is set in vibration, the armatures of A ^{1} and A ^{2} will vibrate also, but all the others on the circuit remain still. So, also, if B^1 is caused to emit its musical note, the instruments B, B^2 respond. They continue sounding so long as the mechanical vibration of B^1 is continued, but become silent the moment its motion stops. The duration of the sound may be made to signify the dot or dash of the Morse alphabet, and thus a telegraphic dispatch can be transmitted by alternately interrupting and renewing the sound.

"Where two or more instruments of different pitch are simultaneously caused to vibrate, all the instruments of corresponding pitches upon the circuit are set in vibration, each responding to that one only of the transmitting instruments with which it is in unison. Thus the signals of A are repeated by A^1 and A^2, but by no other instruments upon the circuit; the signals of B^2 by B and B,^{1} and the signals of C^1 by C and C,^{2} whether A, B^2 and C^2 are successively or simultaneously set in vibration.

"Hence by these instruments, two or more telegraphic signals or messages may be sent simultaneously over the same circuit without interfering with one another.

"I desire here to remark that there are many other uses to which these instruments may be put, such as the simultaneous transmission of musical notes differing in *loudness* as well as in pitch, and the telegraphic transmission of noises or sounds of any kind.

"When the armature (c) (Fig. V) is mechanically set in vibration the armature (h) responds, not only in pitch, but in loudness. Thus when c vibrates with little amplitude, a very soft musical note proceeds from h, and when c vibrates forcibly the amplitude of vibration of h is considerably increased, and the sound becomes louder. So if A and B (Fig. VI) are sounded simultaneously, (A loudly and B softly,) the instruments A,^{1} A^2 repeat loudly the signals of A, and the instruments B,^{1} B^2 repeat gently those of B."

We now come to a most interesting part of the application. In the apparatus previously described, the armature had been mechanically set in vibration, and one of the ways had been stated to be by wind. Mr. Bell now proceeds to show another mode "whereby motion can be imparted to the armature by means of the human voice, or by the tones of a musical instrument."

"One of the ways in which the armature (c) (VI) may be set in vibration has been stated above to be by wind."

"Another mode is shown (in Fig. VII) *whereby* motion can be imparted to the armature by means of the human voice, or by the tones of a musical instrument.

"The armature (Fig. VII) is fastenod loosely by one extremity to the uncovered pole (d) of the electro-magnet (b), and its other extremity is attached to the center of a stretched membrane (a). A cone, A, is used to converge sound vibrations upon the membrane. When a loud sound is uttered in the cone the membrane (a) is set in vibration; the armature c is forced to partake of the motion, and thus electrical undulations are caused upon the circuit (E b, e, f, g). These undulations are similar in *form* to the air vibrations caused by the sound, that is, they can be represented graphically by similar curves. The undulatory current passing through the electro-magnet (f) influences its armature, (h) to copy the motion of the armature (c). A similar sound to that uttered into A is then heard to proceed from L."

The theory of the operation of the illustrative device here unfolded is one with which the previous history has made us perfectly familiar.

The utterance by the human voice of a loud sound into the cone sets the membrane in vibration, theoretically, a vibration corresponding accurately to the vibration of the air particles transmitting the sound. The armature attached at its lower end to the membrane is forced to vibrate with it, and these vibrations of the armature produce electrical undulations upon the circuit. These undulations conform exactly in every phase of their variation to the air vibrations.

"These undulations are similar in *form* to the air vibrations caused by the sound, that is, they can be represented graphically by similar curves."

Mr. Bell, as we have seen, had already indicated in the specification in unmistakable terms the definite meaning of this last expression. In the previous discussion of the *modus operandi* of the undulatory current, he had shown that the curves representing the three phases of variation occurring under these circumstances, respectively, in the motion of the armature, in the air vibrations, and in the electrical undulations of the current, were alike in every respect.

This he attributed directly to the exact correspondence existing between the vibratory movement in the current, in the air, and in the motion of the armature, and in each case, in the three vital characteristics of rate, direction and intensity. This was the essential similarity in form in the three cases, represented graphically by a similarity in curve.

Mr. Bell further states that the undulatory current passing through an electro-magnet in the receiver, influences its armature to copy the motion of the transmitting armature, and as a result, a "similar sound" to that uttered into the cone in the transmitter is heard to proceed from the cone in the receiver.

Here again we find in this specification simply the elaboration of the idea concisely expressed by Mr. Bell in his letter of August 14, regarding the magneto-electric current:

> "When we can create a pulsatory action of the current, which is the *exact equivalent* of the aerial impulses, we shall certainly obtain exactly similar results."

As if in the avowed purpose to use every precaution to prevent even the possibility of any misunderstanding, Mr. Bell then proceeds to further define the terms employed in the specification as follows:

> "In this specification the three words, 'oscillation,' 'vibration' and 'undulation' are used synonymously. By the term 'body capable of inductive action' I mean a body which, when in motion, produces dynamical electricity. I include in the category of bodies capable of inductive action, brass, copper and other metals, as well as iron and steel."

The term "undulation" which appears in the general statement of the invention, and in the claims, is thus further defined as being used in a sense synonymous with the the words "oscillation" and "vibration." Webster defines these terms as follows:

> "*Oscillation.* The act of oscillating; a moving backward and forward or swinging like a pendulum; vibration."
>
> "*Vibration.* 1. The act of vibrating, or the state of being vibrated, or in vibratory motion; quick motion to and fro: oscillation, as of a pendulum, or musical cord.
>
> "2. (*Physics.*) A limited reciprocating motion of the particles of an elastic body or medium in alternately opposite directions from their positions of equilibrium, when that equilibrium has been disturbed; as of a stretched cord or other body in producing musical notes, or of particles of air in transmitting sounds to the ear."

This "backward and forward" motion, "to and fro," "in alternately opposite directions," is thus definitely included within the essential meaning of the term "undulatory," as used in the specification. This is exactly in accordance with Mr. Bell's theory as there unfolded, and it expresses perfectly the characteristic movement of the magneto-electric current.

We have now quoted the entire specification except the claims, which are as follows:

" Having thus described my invention, what I claim and desire to secure by letters patent is as follows:

1. A system of telegraphy in which the receiver is set in vibration by the employment of undulatory currents of electricity.

2. The combination of a permanent magnet, or other body capable of inductive action with a closed circuit, so that the vibration of the one shall produce electrical undulations in the other or in itself.

Thus (a) The permanent magnet, or other body capable of inductive action, may be set in vibration in the neighborhood of the conducting wire forming the circuit.

(b) The conducting wire may be set in vibration in the neighborhood of the permanent magnet.

(c) The conducting wire and the permanent magnet may both simultaneously be set in vibration in each other's neighborhood; and in any or all of these cases electrical undulations will be produced upon the circuit.

3. "The method of producing undulations in a continuous voltaic current by the vibration or motion of bodies capable of inductive action, or by the vibration or motion of the conducting wire itself in the neighborhood of such bodies.

4. " The method of and apparatus for transmitting vocal or other sound telegraphically, as herein described, by causing electrical undulations similar in form to the vibrations of the air accompanying the said vocal or other sounds."

Mr. Bell has so clearly explained, in the body of the specification, the precise meaning of the terms employed in these claims, that he has made their intent and meaning exceedingly plain.

The first claim for " a system of telegraphy in which the receiver is set in vibration by the employment of undulatory currents of electricity," obviously covers the use of undulatory currents of electricity in the operation of telegraph instruments, especially in multiple telegraphy, as illustrated in Figs. 5 and 6.

The second claim for "the combination of a permanent magnet, or other body capable of inductive action, with a closed circuit, so that the vibration of the one shall produce electrical undulations in the other or in itself," covers broadly the combination of an electro-magnet and an armature upon a closed circuit, and embraces within its terms all the apparatus illustrated in the drawing and described in the specification.

It has, however, been withheld from controversy in this case, for the obvious reason that the combination in its simplest form was as old as the knowledge of the magneto-electric current.

The third claim for "the method of producing undulations in a continuous voltaic current by the vibration or motion of bodies capable of inductive action, or by the vibration or motion of the conducting wire itself in the neighborhood of such bodies," is broadly for the method of producing undulations in a continuous voltaic current by vibration as expressed, and covers broadly all the apparatus illustrated in the drawing. It is, however, withheld from issue in this case, apparently for the same reason as claim two.

The fourth and final claim for "the method of and apparatus for transmitting vocal or other sounds telegraphically, as herein described, by causing electrical undulations similar in form to the air vibrations accompanying the said vocal or other sounds," by its terms covers broadly both the methods therein designated, and the apparatus operating as there specified. *

It is observable that a broad distinction is made between

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* NOTE.—(C. 2. page 1695, Bell, Q. 605.) Will you look at the paragraph of your first patent, March 7, 1876, which begins: "The advantages I claim to derive from the use of an undulatory current in place of an intermittent one are," and then enumerates five advantages—and state whether, according to your opinion and belief at the time, those advantages ensued from the employment of a current which was undulatory instead of intermittent, regardless of the form of the undulations, or whether the attainment of those ad

the "undulatory currents," the "electrical undulations," and the "undulations," included, respectively, within the first, second, and the third claims, and the "electrical undulations" specified in the fourth claim.

In the first three claims these terms are expressed without limitation, and include *all* undulatory currents and electrical undulations.

In the fourth claim, however, not all electrical undulations are included, but only those of a specific kind, to wit, those "similar in form to the vibrations of the air accompanying the said vocal or other sounds."

The reason why Mr. Bell made this important distinction is clearly manifest. In the body of the specification he had described a number of ways of producing undulatory currents. While these were all capable of possible application, for example, to the purposes of multiple telegraphy, and so were embraced within the terms of the first claim, they were not all capable of use in the electrical transmission of speech.

Thus, one method was described as follows:

"Where a cylinder upon which are arranged bar-magnets, is made to rotate in front of the pole of an electro-magnet an undulatory current is induced in the coils of the electro-magnet."

Mr. Bell had actually made some attempt to utilize undulatory currents obtained in this way for purposes of multiple telegraphy. (C. Vol. 4, pages 986 and 988, and Figs. 17 and 24, *ante*, page 71) Obviously, however, they were wholly unsuitable for use in the transmission of speech.

In this fourth claim, therefore, Mr. Bell sought to designate with "scientific accuracy" exactly those electrical undulations which he was convinced would be effective in the transmission of speech.

He did this "to the best of his ability" and, in the light

---

vantages required the production of some special form of electrical undulations as distinguished from other forms of electrical undulations?

Ans. I believed at the time that the advantages enumerated ensued from he employment of a current which was undulatory instead of intemittent; quite regardless of the form of the undulations.

of the definitions expressed in the body of the specifications, thereby limited himself, plainly and unmistakably, first, to the use of the electrical undulations of the *magneto-electric* current, and second, to the use of those electrical undulations only which are "similar in form to the vibrations of the air accompanying the said vocal or other sounds."

Every part of the specification was thus consistent with every other part and with the whole, and altogether it afforded a complete fulfillment of the purpose outlined by Mr. Bell in his letter of August 14th and a perfect exemplification of his *principle* and of his admirable *theory* regarding the electrical transmission of speech.

XVIII.

Having concluded our analysis of the "George Brown specification" we proceed next in the order of historical development to a consideration of the specification included in Mr. Bell's application for the patent filed in the patent office, February 14, 1876, as it appears in the photo-lithographic copy produced by complainants and printed in the record. (Add. proofs, page 729.)

We find that this specification is substantially the same as the "George Brown specification," except that it contains new matter of a somewhat remarkable character, and an additional claim based upon this new matter as follows:

> "Electrical undulations may also be caused by alternately increasing and diminishing, the resistance of the circuit, or by alternately increasing and diminishing the power of the battery."
>
> "The internal resistance of a battery is diminished by bringing the voltaic elements nearer together, and increased by placing them further apart. The reciprocal vibration of the elements of a battery therefore occasions an undulatory action in the voltaic current. The external resistance may also be varied. For instance, let mercury or some other liquid form part of a voltaic circuit, then the more deeply the conducting wire is immersed in the mercury or other liquid, the less resistance does the liquid offer to the passage of the current. Hence the vibration of the conducting wire in mercury or other liquid included in the circuit occasions undulations in the current. The vertical vibrations of the elements of a battery in the liquid in which they are immersed produce an undulatory action in the current by alternately increasing and diminishing the power of the battery."
>
> "4. The method of producing undulations in a continuous voltaic circuit by gradually increasing and diminishing the power of the battery as set forth."

The old fourth claim in the "George Brown specification" is retained and numbered 5, in the new specification. Moreover, as the new matter is inconsistent with the statement in the "George Brown specification," that "There are many ways of producing undulatory currents of electricity, but all of them depend for effect on the vibration or motion of bodies capable of inductive action," this is amended so as to read as follows:—

"There are many ways of producing undulatory currents of electricity, dependent for effect upon the vibrations or motions of bodies capable of inductive action."

The pertinent question at once arises, what effect or bearing does the interjection of this new matter have upon the old claims retained in this specification, and what construction is now properly to be placed upon them?

It is clearly manifest that in the new nomenclature adopted, the "undulatory" current is no longer exclusively the magneto-electric current. The term is now applied also to a continuous battery current, in which the intensity is varied either by varying the resistance in the circuit, or by varying the power of the battery.

The logical consequence is that when this newly described undulatory current is employed in a system of telegraphy to set the receiver in vibration, its use for this purpose is covered by the very terms of the first claim.

"A system of telegraphy in which the receiver is set in vibration by the employment of undulatory currents of electricity, substantially as set forth."

(The question is here considered, waiving for the present any adverse view founded upon the very significant absence of any attempted description of an apparatus for the utilization of this form of current.)

It is an equally logical consequence that, should this newly described current be applied to the transmission of speech, its use for this purpose would be covered by the fifth claim, provided the electrical vibrations caused were actually "similar in form to the vibrations of the air accompanying the said vocal or other sounds," as that expression is defined in the body of the specification; but otherwise, such use would clearly be outside of the terms of that claim.

It is noticeable that, either owing to carelessness or haste on the part of Mr. Bell, when this passage was interjected into the specification, or, on the other hand, owing to a belief on his part that, while this newly described current might be applicable to the purposes of multiple telegraphy, it was unsuitable for the transmission of speech, Mr. Bell did not even make the attempt to change the explicit definitions given in the body of the specification of the phrase "similar in form to the vibrations of the air, etc."

This phrase therefore, which specifies the essential characteristic of those electrical undulations, which alone are included within the terms of that claim, retains exactly the meaning it had in the George Brown specification.

It is unnecessary to repeat here our discussion of that meaning as fixed by the terms of the specification. It is sufficient to state that the "similarity in form" between the air vibrations and the electrical undulations was based unequivocally upon the common possession in each case of three analogous phases of variation, which continued throughout in exact correspondence in both cases. Where curves are drawn therefore which would express mathematically, with their recognized graphical values, each of these three phases in the two cases, those curves would be exactly similar to each other.

The three essential phases of variation considered by Mr. Bell in his discussion in the specification were variations in rate, direction of movement and amplitude or intensity of the impulse in each case. All three are inherent characteristics of a magneto-electric current caused by the vibration of an armature under the impulses of the air vibrations communicating a sound.

But only two of these are inherent in the newly described current of varying resistance. The current flows continuously in one direction only, and in this essential respect, that exact correspondence to the vibrations of the air utterly fails, and with it that "similarity of form," based by Mr. Bell directly upon that exact correspondence.

Consequently, the newly described current of varying resistance has not been claimed by Mr. Bell, in this patent, for use in the transmission of speech, but for multiple telegraph purposes alone.

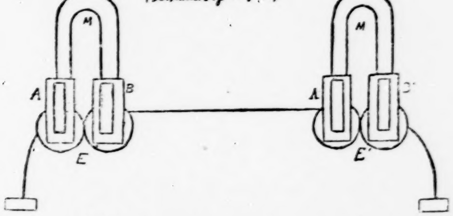
Moreover, the *modus operandi* of the newly described current of varying resistance, when employed in the transmission of speech, is wholly different from that of the magneto-electric current under similar circumstances.

Where the magneto-electric current is induced by the vibration of an armature, set in motion by the corresponding air vibrations communicating a sound, the variations taking place in the current correspond exactly to the variations simultaneously occurring in the motion of the vibrating armature and of the air particles. There is not only an exact correspondence in the *direction* of the movement in the three cases, but there also exists an exact and instantaneous correspondence in the relative *intensity* in the three cases.

Mr. Bell has clearly explained the *rationale* of this correspondence in intensity as follows:

"I understood from the well known laws of magneto-electricity that a current of electricity would be induced in the coils of the electro-magnet E. Fig. 7 (15)

FIG 15
(Summer of 1874)



when any one of the transmitting reeds A moved downward or upward, and that the *strength* of the current would be proportional to the *velocity of the motion* of the reed. I therefore inferred that as the velocity of the motion of the reed was increased when the amplitude of its vibration was increased, that the strength of the current produced by the vibration was also increased.

"(C. Vol. 2, page 117, Ans. 35.)"

Complainant's able counsel in the argument in the court below further explained this matter in a singularly clear and lucid manner, as follows:

"If I move this armature or piece of metal up to the core of the magnet, I shall also excite in the electricity a tendency to flow. If I move the piece of metal up to it, the tendency of the current, generated by the expenditure of the force of any of my fingers, is to flow in one direction. If I move the piece of metal away, the tendency is to flow in another direction. Now, it is not the *position* of the armature which makes the current. There is no more current when the armature is close to the magnet than there is when it is in the next room. It is the *motion* of the armature which makes the current. In other words, it is the expenditure of the force of my fingers which generates or is the cause of the electrical disturbance and flow. And, in as much as it is not the *position* of the armature but only the *motion* which generates the current, it necessarily follows that as long as you move this piece of metal within the magnetic reach, the current is flowing in that coil and the connected circuit. When I stop moving it, no matter where I stop, the current stops too.

"That is not all. That current, in its flow, is due to the motion of the armature. If I move the armature gently, the current is gentle; if I move it violently, the current becomes violent. Your Honor sees very well, therefore, that the currents which are produced in this contrivance have to correspond to the motion of this piece. So long as this moves the current flows; if this moves violently, the current flows violently; if it moves gently, the current flows gently. You can therefore fairly say that all the currents represent, or are copies of, the motion of this. If now, instead of moving this by my finger, I use as armature a thin disk of sheet iron and speak to it, the vibrations produced in the air by my voice move that thin disk just as they would move the drum of the listener's ear and in quite the same way. This thin, elastic material can and will move in the same way if supported properly at the edges. Suppose now, that instead of using this thing which I hold in my hand and wave in front of the magnet, I place here this thin diaphragm, supporting its edges on a frame in front, and speak to it. Then it will move, and every motion of this disk which constitutes the armature (so prompt and so accurate is the performance of the apparatus), every motion of it to and fro, as it vibrates, generates a current in these coils which will correspond to the motion just as it did when I moved the heavy armature with my hand. The motions of the electricity in the coil, or, so to speak, the currents of electricity, will correspond to and will be the copies of the vibratory motions of this plate.

"One more thing: If I speak to that, the motions of this plate are copies of the vibrations of the air particle. My voice moves one particle, and that moves the next one, and that moves the next one, and thus the same motion is communicated through them to the disk; it not merely makes it vibrate, but makes it vibrate in the same way, manner and fashion, causing this to perform the same *form* of vibration. What is the consequence? Why, that the currents which the motion of this produces in obedience to itself, in this coil, are themselves the copies of the motions of that armature disk, which are the copies of the motion of that air particle; so that the currents may very properly be said to be copies of the very motions of the air particle agitated by my voice. If the agitation of the air particle is at any instant violent, the current becomes more violent; if the agitation of the air particle is less violent, the current at once weakens. Now it is true, not merely when I move the particles of air, not merely when I move the armature to and fro, that the currents arise, but if, while moving the armature from one extreme of its vibratory path to the other, I move it fast during the first part of the path, then the current at that instant is stong, and if I move it slow during the next portion of the same movement, the current is weak. Let it return part of its way on its path, and the current returns on its path. The changes of current, therefore, are copies of the motions of the armature, not merely in respect to the time during which the total motion takes place, not merely in respect to the mean violence of the movement of the armature during its total motion, but in respect to every change which can take place in the motion of the armatures while the motion from one extreme to the other is being performed. The currents, therefore, will not correspond merely in number to the vibrations of the armature (and the air particles which move it) but they still correspond in their *character* to what I have described as the *form* of the vibration which the armature and its actuating air particle perform."

(Argument of J. J. Storrow in U. S. C. C., Southern District of New York, page 12. The *italics* are Mr. Storrows.)

On the other hand, and in severe contrast, the continuous current of varying resistance, when used under the same circumstances, in the transmission of speech, operates in a totally different manner. It is not the *motion* of the armature which makes the current. It is the *position* of the armature which makes the current. And, inasmuch as it is not the *motion* of the armature, but only the *position* which regulates the current, it necessarily follows that the moment of greatest intensity in the current on the line is when the position of the diaphragm is such as to impose the greatest pressure on the carbon, for example, and thus diminish to the least degree the resistance to the flow of the current. This occurs when the diaphragm is in position at one extreme limit of its vibration. On the other hand, the moment of least intensity in the current occurs when the diaphragm is at a position at the opposite limit of its vibration.

Note now the radical difference in the *modus operandi* of the two currents when operated simultaneously by diaphragms acted upon by the voice.

With the magneto-electric current, when the diaphragm is for the instant without motion, at the extreme limit and turning point of its vibration, the current is at zero, or without existence. As the motion of the diaphragm commences and increases to a maximum at the center of its vibration, the intensity of the current, induced by this motion, correspondingly increases also to a maximum at the same point. And in the movement of the diaphragm from the center to the other limit of its vibration, its motion and the intensity of the current are correspondingly decreased to zero at the limit. There is thus afforded in the entire movement that perfect correspondence in *form* so clearly set forth by complainants' counsel in the passage above quoted

While the diaphragm has thus passed through one vibration in one direction, its motion and also the intensity of the induced electrical impulse have together each passed through two phases of change, to-wit; first, an *increase* from zero at the outset to a maximum at the center, and then a *decrease* to zero again at the farther limit.

On the contrary, with the current of varying resistance, when the diaphragm has thus passed through one vibration in one direction, the intensity (or more properly the quantity) of the current has passed through only one phase of change, to wit, *a continual increase* of intensity during the whole passage of the diaphragm from one limit to the other of its movement.

Instead of an *exact correspondence* there is no correspondence in *form* whatever between the two currents. As one of them, to wit, the magneto-electric current thus induced, is "similar in form" to the air vibrations, the current of varying resistance *is not* and *can not* be thus "similar in form." Two things which are not similar to each other can not both be similar to a third thing.

XIX.

Next in order comes a brief consideration of the amendment to the original specification filed in the Patent Office as follows (C. Vol. 4, page 16):

"In the matter of the application of A. Graham Bell, for patent for improvements in telegraphy filed February 14, 76."

"In this matter amend the specification as follows:

"Page 2, erase line 19 to line 24 inclusive, and substitute therefor the following:

In appending application for letters patent, filed in the U.S. Patent Office, February 25, 1875, I have described two ways of producing the intermittent current, the one by actual make and break of contact, the other by alternately increasing and diminishing the intensity of the current, without actually breaking the current; the current produced by the latter method I shall term for distinction's sake, a pulsatory current.

"My present invention consists in the employment of a vibratory or undulatory current of electricity, in contradistinction to a merely intermittent or pulsatory current, and of a method of, and apparatus for, producing electrical undulations upon the line wire.

"The distinction between an undulatory current and a pulsatory current will be understood, by considering that electrical pulsations are caused by sudden or instantaneous changes of intensity, and that electrical undulations result from *gradual* changes of intensity exactly analogous to the changes in the density of air, occasioned by simple pendulous vibrations. The electrical movement, like the aerial motion, can be represented by a sinusoidal curve, or by the resultant of several sinusoidal curves.

"Intermittent or pulsatory and undulatory currents may be of two kinds, accordingly as the successive impulses have all the same polarity, or are alternately positive and negative.

"Page 13, line 15, after 'synonymously' (insert and in contradistinction to the terms 'intermittent' and 'pulsatory."

"In the 4th claim, erase the word 'alternately' whenever it occurs, and substitute therefor the word ('gradually.')

"Pollok & Bailey,
"Attys. for A. Graham Bell."

On careful examination there is here developed the remarkable fact that each of the three items of this amendment is inserted solely for the purpose of further explaining and elucidating the new passage, which had been interjected into the specification, and which, as we have seen, was not contained in the "George Brown specification."

The last item, "In the 4th claim, erase the word 'alternately' whenever it occurs, and substitute therefor the word ('gradually,')," is made explicitly in amendment of the new fourth claim.

As regards the second item of the amendment; the statement contained in the original specification, "In this specification the three words 'oscillation,' 'vibration' and 'undulation' are used synonymously," had, as we have already seen, limited the significance of the word "undulation" as used in the claims, to a meaning including an essential backward and forward, to and fro movement. This meaning was exactly adapted to express the characteristic movements of the magneto-electric current, which alone was originally claimed.

But it did not fit the newly described current of varying resistance, and, indeed, it expressly excluded it.

A careful consideration could not fail to reveal such a discrepancy; but for some reason the statement was not struck out by an official amendment, but instead, its meaning was deftly shaded off by the addition of the words "in contradistinction to the terms 'intermittent and pulsatory.'"

Again the distinction between the "undulatory" current, as limited to the magneto-electric current, and the "intermittent" current had been intelligently discussed at great length in the body of the specification. The newly described current was a continuous battery current varying in its intensity. But a continuous battery current which was varied "by alternately increasing and diminishing the intensity of the current, without actually breaking the circuit" had been already described in another pending application filed by Mr. Bell, Feb. 25, 1875.

The most casual consideration must have revealed to Mr. Bell and his attorneys, the propriety, and even the necessity of distinguishing between two such similar currents. Accordingly, the first item of the amendment was inserted so as to point out the essential distinctions. This was done by the introduction of still another new term, "pulsatory," which admirably served the purpose.

Mr. Bell, in his sworn Preliminary Statement in the Speaking Telephone Interferences, made the following statement: (C. Vol. 4, page 1010.)

"I completed the specification for my American patent early in January, and sent it to Mr. Hubbard in Washington, to be examined by Mr. Pollok. I am not able to fix the date when I sent it, but on the 18th of January I received a letter from Mr. Hubbard expressing his satisfaction with it, and it must have been returned to me then, or immediately after, as I made oath to it in Boston, on the 20th of January, 1876, and sent it back to Mr. Hubbard. The reason why it was not filed immediately was that it was deemed important that I should meet Mr. Pollok and go over it with care. We met in New York shortly after and spent a day in considering the specification. No change whatever was made in it, and Mr. Pollok took it back with him and filed it in the patent office on his return."

Mr. Bell had already spent many weeks in the careful study and preparation of this specification; we quote again his statements of the especial care he used in this matter:

"I wrote and rewrote the specification a number of times and finally adopted that mode of expression that seemed to me best to explain my invention and the relation that one part of it bore to another." (C. Vol. 2, page 1620, Ans. 394).

"It will be understood, then, that in October, 1875, I was placed in a very serious dilemma. I expected from day to day to hear from Mr. George Brown, and, while waiting, I occupied myself in writing and rewriting my specification. I felt that I had made a great invention; that I had invented what is now known as 'the speaking telephone.' I tried to embody this in my specification and to express it in language that should be scientifically accurate and complete, and to the best of my ability I did so." (C. Vol. 2, page 1678, Ans. 563.)

We are now confronted by an extraordinary fact. Mr. Bell had labored for weeks, to the best of his ability, to perfect his specification and to make it "scientifically accurate and complete" in expression. Subsequently to the final completion and verification of that specification, Mr. Bell and Mr. Pollok, his attorney, had passed a day together in New York in its careful examination, a day devoted especially to that work.

Yet, notwithstanding all this extraordinary care and diligent study, the specification appears in the Patent Office containing such obvious inaccuracies of expression, such inconsistencies and such a lack of complete definitions, that the amendment formally made was rendered absolutely necessary to properly complete the specification. There was certainly no lack of ability or discernment in Mr. Bell or Mr. Pollok, for they were the ones who saw the obvious necessity for the amendment, and made it and filed it in the Patent Office.

We are startled by this extraordinary phenomenon. But the more we study the matter, the more the mystery grows. The "George Brown specification" was, indeed, complete and "scientifically accurate" in all its expressions. It was consistent with itself in every part, and was indeed a model specification.

Again, all the difficulties cluster about this new passage interjected into the specification. It does not *fit* into the place. It is foreign to its environment. It is not in accord with the great theory elaborated with such careful detail in the body of the specification. Other expressions have to be modified to soften their antagonism.

Further, it is not only isolate and alien to the rest of the patent, but it is inconsistent with the purpose outlined by Mr. Bell in his letter of August 14th, to patent "the use of the magneto-electric current." The key no longer fits the tumblers of the lock.

Still further, it is absolutely disconnected from the brilliant conception which had its first inception in the summer of 1874, and which Mr. Bell, during the succeeding months had elaborated with such care, which led to the intense labors of June and July, 1875, and which finally found its consummation and perfect expression in the "George Brown specification."

What is the explanation?

How came about such an anomaly as is here presented?

One is naturally and inevitably led to make the inquiry, What were the circumstances which occasioned such a diversion? How came a man of Mr. Bell's exceptional and proved abilities to insert the passage in the specification in such a bungling manner?

We turn to the record and ask Mr. Bell what were these circumstances?

Our only answer is, *Silence.*

Mr. Bell has given us at length all the details, even to the chain of reasoning he employed, in the development of his idea of the use of the magneto-electric current, but now, not a thought or a circumstance is mentioned by Mr. Bell in explanation of the origin of this passage, or even of the extraordinary statement that "the more deeply the conducting wire is immersed in the *mercury*," "the less resistance does the liquid offer to the passage of the current." All is left shrouded in the silence of mystery.

The mind can not rest content under such circumstances, but must probe the matter to the very depths, if possible.

We turn to other sources of information contained in the record, seeking for any and every circumstance that may possibly throw any light upon the subject. We find at once an account of the occurrence of an incident of such a remarkable character as to immediately arrest our attention; we perceive the possibility of its having a bearing directly upon the subject of our investigation.

It appears by reference to the certified copy of the file wrapper and contents of Mr. Bell's patent (C. Vol. 4, page 14), that on the same February 14th that Mr. Bell's original application was filed in the patent office, Mr. Elisha Gray, of Chicago, filed in that office the following caveat:

"UNITED STATES PATENT OFFICE.

ELISHA GRAY, OF CHICAGO, ILLINOIS, TRANSMITTING VOCAL SOUNDS TELEGRAPHICALLY.

GRAY'S CAVEAT.

Filed February 14, 1876.

TO ALL WHOM IT MAY CONCERN:

"Be it known that I, *Elisha Gray*, of Chicago, in the county of Cook, and State of Illinois, have invented a new *Art of transmitting vocal sounds telegraphically*, of which the following is a specification:

"It is the object of my invention to transmit the tones of the human voice through a telegraphic circuit, and reproduce them at the receiving end of the line, so that actual conversations can be carried on by persons at long distances apart.

"I have invented and patented methods of transmitting musical impressions or sounds telegraphically, and my present invention is based upon a modification of the principle of said invention, which is set forth and described in *Letters-Patent* of the United States, granted to me July 27, 1875, respectively numbered 166,095 and 166,096, and also in an application for Letters-Patent of the United States, filed by me February 23, 1875.

"To attain the objects of my invention, I devised an instrument capable of vibrating responsively to all the tones of the human voice, and by which they are rendered audible.

"In the accompanying drawings I have shown an apparatus embodying my improvement, in the best way now known to me, but I contemplate various other applications, and also changes in the details of construction of the apparatus, some of which would obviously suggest themselves to a skillful electrician, or a person versed in the science of acoustics, on seeing this application.

"Figure 1, represents a vertical central section through the transmitting instrument;

ELISHA GRAY

INSTRUMENTS FOR TRANSMITTING AND RECEIVING VOCAL SOUNDS TELEGRAPHICALLY

CAVEAT FILED FEBRUARY 14TH 1876

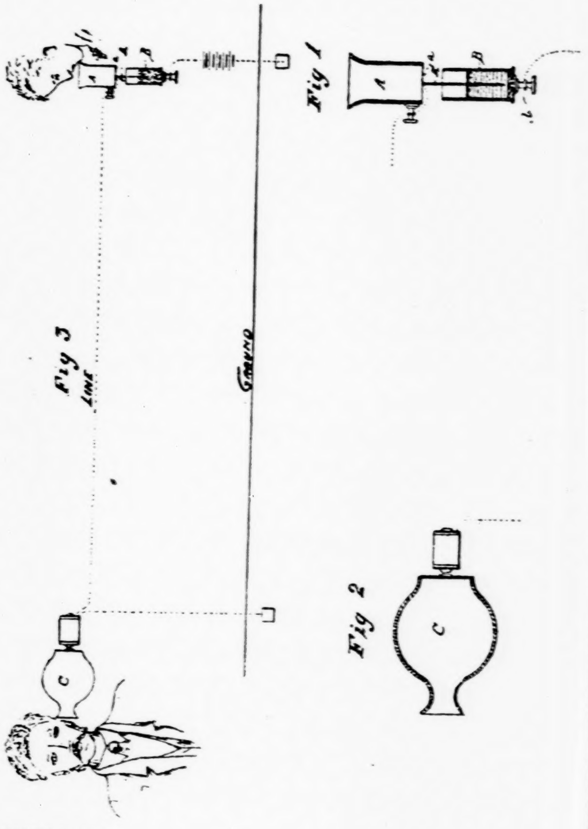


Fig 1
A
B
Fig 3
LINE
GROUND
C
Fig 2
C

WITNESSES

Wm A Skinkle
F Stith

INVENTOR:

Elisha Gray

"Figure 2, a similar section through the receiver; and

"Figure 3, a diagram representing the whole apparatus.

"My present belief is, that the most effective method of providing an apparatus capable of responding to the various tones of the human voice, is a tympanum, drum or diaphragm, stretched across one end of the chamber, carrying an apparatus for producing fluctuations in the potential of the electric current, and consequently varying its power.

"In the drawings, the person transmitting sounds is shown as taking into a box or chamber, A, across the outer end of which is stretched a diaphragm (a) of some thin substance, such as parchment or gold beaters' skin, capable of responding to all the vibrations of the human voice, whether simple or complex. Attached to this diaphragm is a light metal rod A^1 or other suitable conductor of electricity, which extends into a vessel B, made of glass or other insulating material, having its lower end closed by a plug, which may be of metal, or through which passes a conductor b, forming part of the circuit.

"This vessel is filled with some liquid possessing high resistance, such, for instance, as water, so that the vibrations of the plunger or rod A^1, which does not quite touch the conductor b, will cause variations in resistance, and, consequently, in the potential of the current passing through the rod A^1.

"Owing to this construction, the resistance varies constantly, in response to the vibrations of the diaphragm, which although irregular, not only in their amplitude but in rapidity, are nevertheless transmitted, and can, consequently, be transmitted through a single rod, which could not be done with a positive make or break of the circuit employed, or where contact points are used.

"I contemplate, however, the use of a series of diaphragms in a common vocalizing chamber, each diaphragm carrying an independent rod, and responding to a vibration of different rapidity and intensity; in which case contact points mounted on other diaphragms may be employed.

"The vibrations thus imparted are transmitted through an electric circuit to the receiving station, in which circuit is included an electro-magnet of ordinary construction, acting upon a diaphragm to which is attached a piece of soft iron, and which diaphragm is stretched across a receiving vocalizing chamber *a*, somewhat similar to the corresponding vocalizing chamber A.

"The diaphragm at the receiving end of the line is thus thrown into vibration corresponding with those at the transmitting end, and audible sounds or words are produced.

"The obvious practical application of my improvement will be to enable persons at a distance to converse with each other through a telegraphic circuit, just as they now do in each other's presence, or through a speaking tube.

"I claim, as my invention, the art of transmitting vocal sounds or conversations telegraphically through an electric circuit.!

"ELISHA GRAY.

"Witnesses:
"WILLIAM J. PEYTON,
"WILLIAM D. BALDWIN."

We find in this caveat a clear statement of a proposed use of a current of varying power for the transmission of vocal sounds and speech. A method of varying the power of the current by varying the resistance in the circuit, is distinctly described, and, in particular, the mode of operating by immersing the conducting rod in a liquid of high resistance, is definitely set forth.

"This vessel is filled with some liquid possessing high resistance—such, for instance, as water—so that the vibrations of the plunger or rod A^1, which does not quite touch the conductor *b*, will cause variations in resistance, and, consequently, in the potential of the current passing through the rod A^1.

The similarity of the ideas expressed, respectively, in the caveat and in the new passage interjected into Mr. Bell's specification, is perfectly plain.

The bearing of the one paper upon the origin of the other is sufficiently evident, if only it be shown that they were actually brought into connection. *If* the contents of this caveat had been brought to the knowledge of Mr. Bell or his attorney; if this knowledge had been gained in seasonable time and under such circumstances as to permit of the surreptitious insertion of the new passage in the specification; and finally, if Mr. Bell and his attorney were dishonorable enough to perpetrate such a fraud upon Mr. Gray and the public—if all this were true, then the mystery would be cleared up, and we would have in our possession a complete and adequate explanation of the presence of this passage in the specification, and one entirely consistent with every circumstance we have already mentioned.

Such a solution of the enigma, however, involves an imputation upon Mr. Bell of such rascality, and of the actual perpetration of a fraud so wicked, so monstrous, and so far-reaching in its disastrous consequences, that its very statement creates a shudder of horror and aversion.

And yet, in all solemnity and with a due sense of the awful responsibility involved in making the charge, we here state to the court that a careful examination of the facts disclosed in complainant's own record has forced upon us the absolute conviction that this new passage was surreptitiously inserted in the specification *after* it was filed in the patent office, and *after* Mr. Bell's attorney, Mr. Pollok, had gained a knowledge of the contents of Mr. Gray's caveat. In plain Anglo-Saxon, we are convinced that Mr. Bell *stole* this from Mr. Gray.

XX.

It is plainly our duty to present to the court for its information the facts established in the record, which have produced in us this conviction. In the orderly development of the subject, the first great *fact*, startling in its significance, is the established existence in those days of a conspiracy between Mr. Bell, Mr. Pollok, his attorney, and the Examiner in the Patent Office, in the class of electricity, to illegally and illegitimately promote Mr. Bell's patent interests at the expense of Mr. Gray's, and in direct violation of the requirements of secrecy established for the protection of all inventors.

The public, for some reason, has long suspected the existence of this conspiracy, and the executive department of the government has even taken steps to ferret it out. We should hardly expect, however, to find any evidence of it in this case, and least of all, in complainants own record.

But to our astonishment, we find here a narrative, written over Mr. Bell's own signature, giving, in circumstantial detail, the *modus operandi* followed by these conspirators in the prosecution of their nefarious plot against Mr. Gray and his interests.

But first, let us consider for a brief moment the pose Mr. Bell has assumed throughout the whole case as the very personification of high-toned, super-sensitive conscientiousness.

In his preliminary statement in Harmonic Interferences, sworn to May 8, 1876, Mr. Bell inserted the following passage:

"It was just at this time (September or October, 1874,) that I first heard of Mr. Elisha Gray. I received a note from my friend Dr. Clarence J. Blake, in which he alluded to a letter received from Mr. Elisha Gray, descriptive of experiments made with Prof. Tyndall, relative to the telegraphic transmission of vocal sounds. Dr. Blake stated his desire to show me the letter, and expressed his wish to have me meet Mr. Gray. I called upon Dr. Blake next day, and told him that as I was at that time applying for a caveat for an invention which would ultimately lead to the telephonic transmission of vocal sounds, I thought it might be well for me to be ignorant of Mr. Gray's researches until I had secured my patents. For this reason I did not see the letter, and I am still ignorant of its contents."

Again in 1879, Mr. Bell testified in the *Dowd* case as follows (C. Vol. 1, page 123):

"Int. 51. You say that this first conversation on this subject with Dr. Blake was soon after the 21st of October, 1874; how do you fix that date? Ans. By reference to a letter that I received from him dated Oct. 21, 1874, in which he referred to some letter that he had received from Mr. Elisha Gray, concerning experiments in telegraphing 'vocal' sounds. [I visited Dr. Blake within a day or two after receiving his letter, and told him I did not wish to see Elisha Gray's letter, as I was then engaged upon the problem of the transmission of articulate speech by electricity, and did not wish to be indebted to any one for information upon the subject.]"

Again (C. Vol. 1, page 170):

"Int. 171. In your fifty-first answer, you referred to a letter which you received from Dr. Clarence J. Blake, dated Oct. 21, 1874, in which he referred to a letter from Mr. Elisha Gray; have you since seen that letter of Mr. Elisha Gray to Dr. Blake, and where is it now? Ans. I have. Dr. Blake produced the letter as a part of his deposition in the harmonic telegraphic interference case between Mr. Elisha Gray and myself, and a copy of it is to be found at page 121 of the printed evidence in that case.

"Int. 172. Does that letter from Mr. Gray make any reference whatever to the transmission of vocal sound, or make any statements as to the character of Mr. Gray's inventions, experiments or apparatus? Ans. It does not."

And again, upon his cross-examination in 1883, (C. Vol. 2, page 1603, Ans. 344,) Mr. Bell added to his answer the following statement:

"The fact of an explanation of a speaking telephone having been given to Dr. Blake in October, 1874, is impressed upon my memory by the fact that this explanation was the result of a letter I had received from him, dated October 21, 1874, (printed on page 342 of complainant's record,) in which he used the following remarkable expression which at once riveted my attention, 'I have received a letter from the Royal Institute from Elisha Gray concerning his experiments in telegraphing vocal sounds which you will be glad to see.'

"My fears were at once aroused. I was afraid that some one else was at work upon the speaking telephone. I visited Dr. Blake within a few days of the receipt of his letter, not for the purpose of learning what Mr. Gray or any one else had done in this line, but, 1. For the purpose of describing to him the method and apparatus that I had devised for the reproduction of articulate speech by electrical means. 2. And for the purpose of seeking his advice concerning the operation of the membrane telephone I had devised, as he was a scientific man of eminence who had devoted much time and thought to acoustical subjects, and especially to the subject of the vibration of loaded membranes like that of the human ear and in the Scott Phonautograph. I remember very distinctly that these were the objects with which I visited Dr. Blake, and I remember also that I refused to see the letter from Mr. Elisha Gray in spite of Dr. Blake's assurance that it had nothing to do with vocal sounds."

This public parade of Mr. Bell's solicitude to remain in ignorance of his rival's labors cost nothing, for Dr. Blake assured him at the time that the letter "had nothing to do with vocal sounds."

But later on there was something at stake, and then, in the privacy of the home circle, and in a gushing letter written to his parents, Mr. Bell reveals an altogether different character.

This letter reads as follows: (C. Vol. 4, page 969):

"SALEM TO BOSTON, March 5, 1875.

DEAR PAPA AND MAMA:

Please let me hear from you soon. Let me hear all the news. I have been working day and night in Washington, so that I have been unable to see the sights as yet. Everything looks most promising. One of the first things I did on reaching Washington was to set up my apparatus so as to make four stations, A, B, C, D. My

wish was to illustrate that a message could be sent from B to C at the same time that a message passed from A to D.

I had four cells of a battery, but no acids. In order to have plenty of battery power that the thing might work well enough, I wished six cells and a mixture of bichromate of potash with some acid (I forgot what).

There was only one electrician in town, and I went to him for everything, unfortunately giving my name.

He sent me down two cells of Lockwood's battery, and I was surprised that the young man who brought them came right into the parlor and stared about, to see what kinds of instruments I had got.

Still further was I surprised to find that the two cells he brought would not work.

The young man came back with the bi-chromate for the other cells, but I had my suspicions aroused, and did not use the solution.

To add to my distress Mr. Hubbard informed me that Mr. Orton (the president of the Western Union Telegraph Company) would be round in half an hour to see my instruments.

The Western Union is probably the largest corporate body that has ever existed.

It controls more miles of telegraph wire than there are in the whole of Europe. It was, therefore, important to have my instruments in good shape. I did my best by getting nitric acid and sulphuric acid to get the cells I had in working order. I sawed a large carbon in two, borrowed a couple of slop-basins, and had the whole in working order just *half a minute* before Mr. Orton made his appearance. The instruments, by good luck, never worked better. Mr. Orton was very much interested, and said he would like to see me again, but had to go to New York that night.

Two days afterward I was in the Capitol seeing the Senate, when a gentleman came up and tapped me on the shoulder. It was Mr. Orton. He told me that the Western Union would be glad to give me every facility in perfecting my instruments, and he gave me a hearty invitation to take apparatus to New York, and I should have the assistance of their best electricians.

They have a special experimental room, and have at instant command thousands of cells of battery, and thousands of miles of real line wire to test with.

Mr. Orton said further, that he wished me distinctly to understand that the Western Union had no interest in Mr. Gray or his invention.

This is very encouraging. Mr. Orton had *previously* seen Gray's apparatus, and yet he came forward to take up mine.

In regard to the patents: My lawyers, Pollok and Bailey, found on examination at the patent office, that I had developed the idea so much further than Gray had done, that they have applied for *three distinct patents*, in only one of which I come into collision with Gray.

The first patent covers the principle "Multiple Telegraphy," basing my claim upon the instruments exhibited. (These instruments require two lines, an up-line and a down-line.)

The second patent covers the principle of using an *induced current*, so as to permit a single wire to be employed.

The third patent is for a "vibratory circuit breaker," for the purpose of converting the vibratory motion of my receiving instrument into a permanent *make* or *break* of a local circuit.

By this arrangement I can make a receiver work *any instrument whatever* that can be moved by electro-magnetism, and it is developed into a very curious form of "Autograph Telegraph," by means of which an autograph message or picture may be almost instantly copied. The copy is made in ordinary ink and on ordinary paper.

My lawyers were at first doubtful whether the examiners would declare an interference between me and Gray, as Gray's apparatus had been there for so long a time.

They feared I had but a poor chance, and my spirits at once fell to zero. They said it would be difficult to convince them that I had not copied. When, however, they saw the "Autograph Telegraph" developed from the idea of multiple telegraphy, they at once said that was a good proof of independent invention, as Gray had no such idea. It further turned out that an examiner in the patent office (not, however, of electrical inventions) is a deaf mute, and knows me personally and by reputation, and could surely vouch for the fact of my being incapable of copying Gray.

Another fortunate circumstance was this. That the very examiner into whose hands this will come, happened to be in Mr. Pollok's office one day when I called, so that I had a long interview with him, in which I explained everything to him, and I can't help thinking that he must have been convinced of my independent conception of the whole thing.

After making out our specifications and examining into the whole thing, Mr. Pollock said, "You have a good case." The last words he said when I left were, "You need not fear; we shall pull you through all right."

Whenever Gray's lawyer heard that I was in town he applied to the patent office to complete Gray's patent, and thus force me to a law suit.

The examiners, however, could not act in the matter for ten days, so that gave me time to get my application in in time. I am now waiting for the decision of the examining board. They will probably declare an interference. Then I shall have to have witnesses examined and prove priority.

The invention could not have come out at any better time than the present. I shall explain how.

There are two rival telegraph companies in America: The Western Union and the "Pacific Line."

The Western Union have hitherto enjoyed a monopoly. But last year a man invented a method of sending *four messages simultaneously* along the same wire, and the Pacific Telegraph Company bought his patent for seven hundred and fifty thousand dollars ($750,000).

"The result has been that the Pacific Company has been able to reduce their prices so as to compete successfully with the Western Union.

"Now my invention comes out as a means by which thirty or forty messages may be sent simultaneously, and by which intermediate stations may communicate with one another. If the Western Union take it up it would enable them to recover lost ground. At all events it is evidently a good time to bring out the invention. I visited the Western Union Telegraph headquarters in New York on my way here. I have made arrangements to spend Saturday and Sunday every week in New York at the West. Un. building.

"I am to have the assistance of Mr Prescott (the author of the book you have on telegraphy), so now I feel that all is plain sailing if I can prove priority.

"Here is Boston. Much love.

"Aleck."

Now it appears from the official records of the Government, published with the Annual Reports of the Commissions of Patents, and also from the Official Gazette of the Patent Office, that, at that time, *no patent whatever* had ever been granted to Mr. Gray relating in any manner to multiple telegraphs, and that no patent of any description had then been granted to Mr. Gray after 1872.

The following recitals are contained in Mr. Gray's later patents as they appear in the record:

"Improvement in electric telegraphy for transmitting musical tones.

"Specification forming part of Letters Patent No. 166,096, dated July 27, 1875; application filed January 19, 1875." (Overland Case, Vol. 3, page 131.)

"Improvement in electric telegraphs for transmitting musical tones. Specification forming part of Letters Patent No. 166,095, dated July 27, 1875; application filed Jan 19, 1875." (*Ibid.*, page 139.)

The application filed by Mr. Gray, February 23, 1875, remains still in interference.

It is therefore demonstrably certain that the "examination at the patent office" made by Pollok and Bailey was not a legitimate examination of Mr. Gray's patents, but an illegitimate and illegal examination of the contents of Mr. Gray's pending *applications*. Indeed, this is made sufficiently clear from the context of the letter, without rendering it at all necessary to refer to the official records.

Notice, for a moment, the remarkable character of the information thus acquired by Mr. Bell and his attorneys as to the contents of Mr. Gray's applications.

"My lawyers, Pollok and Bailey, found on examination at the patent office, that I had developed the idea *so much further than Gray had done*."

Their facilities in the office were such that they had been able to make a comparison between the development made by Mr. Bell, and that unfolded by Mr. Gray, and this too, before Mr. Bell had filed any application. They were thus enabled to plan in advance how to secure to Mr. Bell important advantages over his rival. They would divide up his work into three distinct applications, and in such a way as to leave only one tied up in conflict with Mr. Gray's, while the other two could be rushed through the office.

This, as we all know, would secure to Mr. Bell a great advantage, especially in the negotiations with Mr. Orton and the Western Union, where Mr. Gray was also his rival. Again, how did Mr. Bell's lawyers ascertain that Gray's apparatus had been there for so long a time?

How did they ascertain from their examination that "Gray had no such idea" as the "Autograph Telegraph?"

The most intimate relations are established with the examiner. He kindly comes to Mr. Pollok's office and canvasses the whole subject with Mr. Bell.

This intimacy bears its appropriate fruit: "Whenever Gray's lawyer heard that I was in town he applied to the patent office to complete Gray's patent, and thus force me to a law suit. The examiners, however, could not act in the matter for ten days, so that gave me time to get my application in in time." By reference to the preliminary statement in the subsequent interference (C. Vol. IV, page 990), it will be seen that Mr. Bell's new application was filed February 25, 1875, which was pretty quick work under the circumstances.

Mr. Bell and his attorney certainly had very prompt information of every move made by Mr. Gray in the patent office.

Is any further evidence necessary to convince us of the existence of this conspiracy between the parties, when we have before us this detailed narrative of their proceedings in direct fraud upon Mr. Gray?

Were there a mass of testimony, it could only be cumulative in its character. The *fact* is sufficiently proved by the "silent evidence" of Mr. Bell's own letter written at this time.

Moreover, reading between the lines of this letter, we are afforded a glimpse of Mr. Bell's real character. His moral sense was so dull and blunted that he seemingly had no adequate appreciation of the wickedness of the proceedings in which he was participating. He actually gloried in his shame.

We can no longer doubt Mr. Bell's capacity or his willingness to participate in the perpetration of another fraud of like character upon Mr. Gray, whenever the opportunity should occur:

Again, the fact of the consummation of this original fraud upon Mr. Gray was itself a moral, or rather immoral force, binding the conspirators together in closer bonds, perpetuating the conspiracy, and continuing its operations as long as the rivalry between Mr. Gray and Mr. Bell should last.

On February 14, 1876, Mr. Bell's new application and Mr. Gray's caveat were filed together in the patent office. Should it subsequently appear that, as matter of fact, Mr. Bell's application did not then contain the passage in controversy, it would not only be manifest, but the mind would be convinced "beyond a reasonable doubt," that that passage was surreptitiously inserted, through the operation of the same conspiracy, whose existence has already been established.

Astonishing as it may appear, a close analysis of Mr. Bell's own testimony, together with that of Mr. Gardner G. Hubbard, reveals the *fact* that when this specification was filed it did *not* contain that passage.

XXI.

The following is a history of the preparation of Mr. Bell's specification as digested from the testimony in complainant's record.

It was commenced in Canada, in September, 1875.

"I commenced the draft of the specification for my patent involved in this interference while I was in Canada. * * * I returned to Boston early in October." (Bell's Prelim. Stat. Speak. Telep. Interference, C. Vol. 4, p. 1010.)

"*Int.* 101. When did you begin to prepare the specification for your patent No. 174, 465, of March 7, 1876? *Ans.* During the month of September, 1875, in Canada, and I continued it in Boston when I returned, during the early part of October." (Bell C. Vol. 1, page 152.)

"*Q.* 562. It has already appeared that you passed the month of September, 1875, in Canada, at your father's; please state what occupied your time during that month, and what attention you devoted to any electrical matters. *Ans.* I went to Canada chiefly for the sake of my health. I spent a great portion of my time (as I remember after reading the notes in my father's diary) in the open air, taking plenty of horseback exercise. I had no means of making electrical experiments, but I attempted, as I found strength and inclination, to reduce to writing my ideas concerning the production and utilization of undulatory currents for the purposes of the speaking telephone and the multiple telegraph. I also occupied a portion of my time in trying to interest friends in my inventions. I hoped to make some pecuniary arrangement for my support in Boston, so that upon my return to that city I might devote all my time to my electrical researches. It was my intention to patent what I had done at once, in the United States and abroad, and I thought that in return for an interest in my foreign patents I could induce some friend to make the arrangement I desired, and to undertake all the expense of the foreign applications.

"Before I left Canada, I had arrived at an understanding of this kind with the late Hon. George Brown, of Toronto, and his brother, Mr. Gordon Brown. (C. Vol. 2, page 1675, Bell.) For the first visit (to Canada referred to in the question) I went on or about September 1, 1875, and arrived in Salem on my return on or about October, 1, (Cross-Q. 536,

C. Vol. 2, page 1667.)" The specification was mainly written in October, 1875.

"I returned to Boston early in October, and resumed work on my specification with a view to placing it in the hands of Mr. Brown in case of his accepting my proposition. I delayed making out an application for a patent in this country, though repeatedly urged to do so by Mr. Hubbard, in order to make some arrangement with Mr. Brown, or some other person, to take out foreign patents. I heard nothing from Mr. Brown until my visit to Canada at Christmas, 1875." (Prelim. Stat. C. Vol. 4, page 1010.)

"Immediately upon my return to Salem, in October, 1875, I prepared the specification for my patent of March 7, 1876, so as to be ready to make application for letters patent in the United States and abroad, the moment a definite arrangement should be concluded with Mr. George Brown and his brother.

"Mr. George Brown had specially requested me to take no steps in America that could be prejudicial to the patents he proposed to take out abroad. I therefore waited anxiously for the definite reply to my proposition that had been promised, but it never came. * * * It will be understood, then, that in October, 1875, I was placed in a very serious dilemma. I expected from day to day to hear from Mr. George Brown, and while waiting I occupied myself in writing and re-writing my specification. I felt that I had made a great invention; that I had invented what is now known as 'the speaking telephone.' I tried to embody this in my specification, and to express it in language that should be scientifically accurate and complete, and to the best of my ability I did so. I did not know much about the patent laws of the country, but believed that the counsel who might be employed by Mr. George Brown and his brother, or Mr. Sanders and Mr. Hubbard, would make the necessary alterations in the phraseology, if any such alterations were deemed necessary. Mr. Hubbard and Mr. Sanders were very anxious to have my specifications filed at once in the United States patent office, but I believed the invention to be so important and so valuable that I wanted it to be taken out abroad, as well as in America, and, therefore, delayed the filing, hoping to hear from Mr. George Brown and his brother." (Cross-Q. 563, C. Vol. 2, page 1676.)

"I saw the specification of the speaking telephone in October, 1875. I believe it was substantially like the one for which the letters patent were issued, though several changes were made in it subsequently to my first seeing it." (Dep. of Gardner Hubbard, C. Vol. 4, page 960.)

The specification was taken to Washington in the first of December, 1875, shown to Mr. Pollok by Mr. Hubbard, brought back by him Dec. 14th or 15th, and then taken back to Washington, January 10, 1876, shown to Mr. Pollok, and again returned to Mr. Bell for his signature and oath, January 18, 1876, and signed and sworn to January 20, 1876.

"I believe I took it with me to Washington in the first of December, 1875. I showed it to Mr. Pollok, brought it back with me on leaving Washington, Dec. 14 or 15, then took it with me on my return to Washington, which was, I think, on the 10th of January, 1876; showed again to Mr. Pollok, then I returned it to Mr. Bell for his signature and oath."

(Deposition of Gardiner Hubbard. Int. 20, C. Vol. 4, page 960.)

Int. 114. Was a specification prepared from these drafts for Mr. G. G. Hubbard to take to Washington and have examined by Mr. Pollok, your patent solicitor? *Ans.* It was.

Int. 115. Did you learn from Mr. Hubbard at any time that Mr. Pollok had examined this specification with him, and found it satisfactory, and if so, when did you learn this? If you have any means of fixing the date with precision, please state what means you have. *Ans.* I heard from Mr. Hubbard to this effect upon the 18th day of January, 1876. I fix this date by reference to a letter that I wrote to Mr. Hubbard's daughter on the 18th of January, 1876, in which the following passage occurs:

"I received a nice letter from your father this morning, in which he says how well pleased he is with the new specification, and that it promises to be of great value if I *prosecute my researches diligently*, if not, others may supplant me. He says, 'I have been over your specification with Mr. Pollok. He is very much pleased with it, and says he does not think it will require any alteration.'"

Int. 116. Have you in your possession the letter from Mr. Hubbard referred to in your last answer? *Ans.* I have not.

Int. 117. Have you made careful search for it? *Ans.* I have, but have been unable to find it.

Int. 118. What day of the week was the 18th of January, 1876? *Ans.* It appears by the calendar that it was Tuesday.

Int. 119. Please state when, if ever, you received from Mr. Pollok's office a fair copy of the specification to be signed and sworn to; and if you have any means of fixing the date, please produce it. *Ans.* I received a fair copy of the specification from Mr. Pollok's office either on the nineteenth or twentieth day of January, 1876, and I took oath to it in Boston on the twentieth of January, 1876. I fix the date of receiving it by a memorandum which has been given me, which I am informed and believe is a press copy of Mr. Pollok's letter to me accompanying the specification. It is as follows:

"January 18, 1876.

"Mr. A. Graham Bell:

"*Dear Sir:*—Herewith find applic. papers, &c., for your new improvements in telegraphy. We have left blank for title of invention in the oath, which you can fill in.

"Please execute the papers as indicated in pencil, and return them to me.

"Very truly yours."

Int. 120. Have you got the original of the letter just read? *Ans.* I have not.

Int. 121. Do you know where it is? *Ans.* I do not.

Int. 122. In whose handwriting was the fair copy of the specification which was sent to you from Washington, as you stated? *Ans.* I do not know. It was in a strange handwriting. I presume it was written by some of Mr. Pollok's clerks.

Int. 123. Please look at the certified copy of the specification now shown you, and state when and where the *jurat* is dated. *Ans.* Suffolk county, State of Massachusetts, the 20th of January, 1876.

Int. 124. It appears from this certified copy that this application was filed in the patent office Feb. 14, 1876: why was it not filed sooner? *Ans.* I had made arrangements to have the specification filed simultaneously in England and the United States, and delayed making the application in the United States patent office in the expectation of receiving a cablegram from England informing me when to file it."

[*Complainants put in evidence a certified copy of file wrapper and contents of Bell patent of March 7, 1876, marked "Complainants' Exhibit 24, Bell's Application of 1876."*]

Int. 125. Please look at the paper now shown you; state who made it. *Ans.* I did.

Int. 126. When and where and for what purpose? *Ans.* I made it at the Queen's Hotel, Toronto, on the 28th day of December, 1875, for the information of the Hon. George Brown.

Int. 127. What occasion had you to give him information on the matters shown in that paper? *Ans.* I expected to conclude arrangements for having him take out patents in England for me and made this drawing to illustrate certain of my inventions.

Int. 128. Is that the same Mr. George Brown spoken of in your letter to Mr. Hubbard of September 28, 1875, which was read as a part of your one-hundredth answer? *Ans.* It is.

Int. 129. State generally what inventions or what apparatus that paper shows. *Ans.* The invention and apparatus described in my United States patent, dated March 7, 1876.

Int. 130. There appears to be a memorandum on the back of it not in your handwriting: who wrote that? *Ans.* The Mr. George Brown referred to.

Int. 131. In whose possession did you leave it after you made it, and when did you next see it? *Ans.* I left it in the possession of the Hon. George Brown, in Toronto, on the twenty-ninth day of December, 1875, and I next saw it in Toronto on the 12th of November, 1878, and requested Mr. Brown to intrust it to Mr. Thomas A. Watson who brought it on to Boston.

Complainants put in evidence the paper referred to, and it is marked "Complainants' Exhibit 25, Bell's Toronto drawing, W. P. Preble, jr., Examiner." (Original No. 37.) (Deposition of Alex. Graham Bell, C. Vol. 1, page 156.)

"*Cross-Q.* 495. Were the drawings of your patent of March 7, 1876, made before or after December 28, 1875? *Ans.* The original sketches, of which the drawings in the patent are copies, were made before that time. I do not know when the draughtsman's drawings were made, except that it was between the middle of December, 1875, and the middle of January, 1876."

(Bell, C. Vol. 2, page 1658.)

"Towards the end of November the expostulations of Mr. Hubbard and Mr. Sanders had their effect; we would no longer wait for Mr. Brown. In the early part of December Mr. Hubbard took my specification to Washington to have it submitted to his counsel there; but at my earnest request he promised that no steps should be taken in the United States patent office until I had had a last chance to interest friends in Canada, so as to have my foreign patents taken out simultaneously with my American patent. On account of the nature of my engagements this opportunity would not arrive until the Christmas vacation." * * *

"In the mean time, as I have stated above, it was my intention to make another attempt, during the Christmas vacation, to interest friends in Canada to take out our foreign patents. I accordingly left Salem for Canada on or about the 24th day of December, and returned about the 1st of January, having in the meantime concluded a definite agreement with Mr. George Brown and his brother. I could not, at that time, ask them for a cash payment sufficient to support me, as I was then carrying out the organization of my professional work in the manner stated above. I asked them, however, and they agreed to make a sufficient allowance to pay the rent of special rooms in which the experiments might be carried on, as I had been much troubled by reports among the workmen in Mr. Charles Williams' workshop, that strangers had been observing my apparatus and had apparently been making notes. In consequence of this arrangement I took rooms in Exeter Place, Boston, to which the apparatus in Mr. Williams' workshop was removed somewhere during January, 1876.

"My recollection is, that at this time also I intrusted the education of the little deaf pupil, to whom I have so often alluded, to one of my normal teachers, and came to Boston to live, thus saving a considerable portion of my time. In consequence of the agreement with Mr. Brown and his brother, my specification was returned to me from Washington, to be sworn to in Boston, and I was much pleased to observe that it had not been found necessary to alter the phraseology."

(Bell, C. Vol. 2, page 1678.)

"I completed the specification for my American patent early in January, and sent it to Mr. Hubbard, in Washington, to be examined by Mr. Pollok. I am not able to fix the date when I sent it, but on the 18th of January I received a letter from Mr. Hubbard expressing his satisfaction with it, and it must have been returned to me then, or immediately after, as I made oath to it in Boston on the

20th of January, 1876, and sent it back to Mr. Hubbard."

(Prel. Stat. C. Vol. 4, page 1010.)

The specification having been signed and verified, it was returned to Washington. Subsequently Mr. Pollok met Mr. Bell in New York, and spent a day considering it with care, returned with it to Washington and filed it in the patent office on his return.

"I made oath to it in Boston on the 20th of January, 1876, and sent it back to Mr. Hubbard. The reason why it was not filed immediately was, that it was deemed important that I meet Mr. Pollok and go over it with care. We met in New York shortly after and spent a day in considering the specification. No change whatever was made in it, and Mr. Pollok took it back with him and filed it in the patent office on his return."

(Prel. Stat. C. Vol. 4, page 1010.)

"My application was not filed before this date in consequence of a promise that I had made to Mr. George Brown, who had then gone to England, that the American application should not be filed until a cablegram had been received from him, telling me that I might do so without prejudice to the foreign applications. I returned my specification to Washington, either to Mr. Hubbard or to Messrs. Pollok and Bailey, immediately after it was sworn to in Boston, January 20th, so as to be ready to be filed in the patent office upon telegraphic notice. I waited anxiously for the promised cablegram from Mr. Brown; but at last Mr. Hubbard became tired of waiting, and on the 14th of February the application was filed in the United States patent office without my knowledge."

(Bell, C. Vol. 2, page 1680.)

"Q. 566. In your letter to Mr. Elisha Gray, dated March 2, 1877, found in answer to cross-question 402, p. 1627, I find the following:

"My specification had been prepared *months* before it was filed, and a copy had been taken to England by a friend. I delayed the filing of the American patent until I could hear from him. At last the protests of all those interested in my invention, deprecating further delay, had their effect, and I filed my application without waiting for a conclusion of the negotiations in England."

"Does that paragraph refer to the withholding of the American application, which you have mentioned in your answer to interrogatory 563? Ans. It does."

(C. Vol. 2, pages 1680, 1682.)

Certain conclusions of fact are unequivocally established by the foregoing testimony, as follows:

Mr. Bell executed his contract with Mr. George Brown and brother at Toronto, December 29, 1875.

After his return from Canada, about January 1, 1876, he completed the specification for the American patent early in January, and Mr. Hubbard took it with him to Mr. Pollok at Washington, on or about January 10, 1876.

Upon the complainant's own showing, not an alteration or change was made in that specification, from the time that it left Mr. Bell's hands, on or about the 10th day of January, 1876, till it was filed in the patent office February 14, 1876.

Mr. Hubbard writes back to Mr. Bell from Washington, in a letter received January 18, 1876:

"I have been over your specification with Mr. Pollok. He is very much pleased with it, and says he does not think it will require any alteration."

Jan. 14, 1876, Mr. Pollok forwards to Mr. Bell "*a fair copy*" of the specification, written in a strange handwriting, presumably the work of one of Mr. Pollok's clerks. Mr. Bell received it and "is much pleased to observe that it had not been found necessary to alter the phraseology." He signs it and swears to it, and returns it, "immediately after it was sworn to in Boston January 20th."

Mr. Pollok and Mr. Bell then meet in New York, and spend a day in the careful consideration of the specification. No change whatever was made in it, and Mr. Pollok took it back with him and filed it in the patent office," and the record of these protestations is closed.

The fact is sufficiently established; but to complete the showing, the complainants have estopped themselves from denying it, by producing in the record, at the last moment, a photolithographic copy of the original application now on file in the patent office, and this shows a clear fair copy, without an erasure or an interlineation. This is exactly the condition in which was the specification when it was sworn to January 20, 1876.

In a word, the American specification was completed between January 1 and January 10, 1876, and suffered no change thereafter, until it was filed in the patent office, February 14, 1876.

It follows, as an inevitable conclusion, that if the controverted passage was in the specification at all before the latter was filed in the patent office, it had been inserted prior to January 10, 1876.

Another consequence is, that if this passage had in fact been inserted in the specification, its incongruities, its inconsistencies with other statements in the specification and the obvious necessity for some amendment escaped the repeated scrutiny of all the parties.

If the passage was there, it passed the ordeal of successive examinations, first, by Mr. Bell himself, when he inserted it; second, by Mr. Pollok, in Washington; third, by Mr. Bell, when he signed the specification and observed it so closely that he was enabled to state that there had been no change made in its phraseology; and finally, the close scrutiny of Mr. Bell and Mr. Pollok together, in New York, when they passed a day in its careful consideration.

Another significant fact is established by the testimony. Mr. Bell delivered the "George Brown specification" to Mr. Brown, just before the latter sailed upon his winter voyage to England.

This delivery was made during the last week in January, and on or about January 25, 1876.

"Q. 570. How long before Mr. George Brown sailed for England did you deliver this paper to him? Ans. I only know that it was handed to him between the date of the agreement, December 29, 1875, and the time he sailed,—the latter part of January, 1876," (Bell C. Vol. 2, page 1682.) The "George Brown specification" bore the following indorsement in Mr. Brown's handwriting:

"These papers were received by me from Professor Alex. G. Bell, in the winter of 1875–6, shortly before I left for England. I can fix the exact date by reference to my books and papers, but have not them at hand now.

GEORGE BROWN.

TORONTO, 12 November, 1878."

(C. Vol. 2, page 1689.)

"I met Mr. Bell in New York about January 25, at his request, to meet Mr. George Brown, of Toronto. We met Mr. Brown, and he agreed to take out letters patent in Great Britain. Mr. Bell gave me his copy of the specification, which I was to take under a promise, which he exacted from me, that it should not be filed at Washington until Mr. Brown should have filed it in England. He did not hear from Mr. Brown as he expected, and finally wrote to me [that if he did not hear by a certain day, that I might file it. I strenuously objected to the least delay, but it was of no avail, as he wished to have it taken out in his native country, that he might there have the benefit of what he believed a great invention.]"

(Gardiner G. Hubbard, C. Vol. 4, page 961, Int. 22.)

It further appears that the "George Brown specification" was originally prepared in October for use as an American specification.

"Q. 571. When was this paper written? Ans. In October, 1875.

"Q. 572. I observe that it is headed 'United States patent office,' from which I infer that this particular paper was originally prepared for your American specification, and not for the purpose of being handed to Mr. George Brown; what is the fact about that? Ans. Certainly, that is the fact." * (C. Vol. 2, page 1682.)

"Q. 576. In the Exhibit George Brown specification there are some alterations made by drawing the pen through words or phrases, and interlining others in place of them. What is your recollection as to when these changes were made? Ans. I have not any clear recollection of the time when these changes were made, excepting that they were made before the specification was given to Mr. Brown." (C. Vol. 2, p. 1683.)

"Q. 585. You have told me this morning that you wanted to make some addition to your answer to interrogatory 571; please do so. Ans. Yes; I desire to state that though from the language used in this paper I know that it is a copy of the specification as I wrote it in October, 1875, I can not be perfectly certain that the copy was itself made in October, 1875, although it is my belief that it was. It

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* NOTE.—Possibly this is an explanation of why Mr. Bell only gave to Mr. Brown, of Toronto, Dec. 29, 1875, rough sketches of his invention. He either did not have this specification with him, or he could not spare it, or for some reason he preferred not to leave it with Mr. Brown at that time.

was made as a fair copy, not in my handwriting. The interlineations and corrections are in my handwriting." (C. Vol. 2, p. 1688.)

The facts are simple and clear. When Mr. Bell desisted from his labors upon the preparation of his specification at the end of October, or about that time, he had some one, presumably a clerk, write out "a fair copy" of his work for presentation in the United States Patent Office. This was the "George Brown specification."

On December 29, 1875, he executed the contract regarding the foreign patents with Mr. Brown, and on his return from Toronto about January 1, 1876, and between that time and January 10, 1876, he "completed" his specification for the American patent, and forwarded it to Washington; and from that time forth there was no change made in it until it was filed in the patent office, February 14, 1876.

It is demonstrably certain that after the "completion" of the American specification, the date of which is fixed, and either at that time or at some subsequent time, Mr. Bell compared the "George Brown specification" with it, and made certain erasures and interlineations therein (in his own handwriting) to make it conform to it. This is manifest from an inspection of the documents in C. Exhibit Vol. 4. pages 6 and 936. The "George Brown specification" is there printed in such a manner as to show both interlineations and erasures, the interlineations being printed in capitals and the erasures in brackets. Thus for example:

"That the difference between an undulatory and an intermittent current may be more clearly understood, I shall describe the condition of the electrical current when THE ATTEMPT IS MADE TO TRANSMIT two musical notes [of different pitch are] simultaneously [transmitted along the same wire] FIRST UPON THE ONE PLAN AND THEN UPON THE OTHER."

Every interlineation and every erasure that appears in the "George Brown specification" changes the tenor of the language where they occur so as to make it conform exactly to the language of *the original fair copy* of the American specification, as it is shown in the exhibit.*

The existing claims in the "George Brown specification" were struck out, and the new claims were inserted, except that the lengthy second claim was arranged in detail to conform to the English practice.

The "George Brown specification" was "handed" to Mr. Brown shortly before he left for England. Mr. Hubbard fixes the time and place of the interview of Mr. Brown, Mr. Bell and himself as at New York "about January 25."

It thus appears, that after the final completion of the American specification, and after the last change had been made in it, previous to its filing in the patent office, *fifteen days,* more or less, passed before Mr. Bell handed the "George Brown specification" to Mr. Brown. But this is not all, Mr. Hubbard, who then resided in Washington says:

"I met Mr. Bell in New York about January 25, at his request, to meet Mr. George Brown, of Toronto. We met Mr. Brown, and he agreed to take out letters patent in Great Britain, Mr. Bell gave me his copy of the specification, which I was to take under a promise, which he exacted from me, that it should not be filed at Washington until Mr. Brown should have filed it in England."

"He did not hear from Mr. Brown as he expected, and finally wrote to me [that if he did not hear by a certain day, that I might file it.'"] (C. Vol. 4, page 961.)

That copy of the specification which Mr. Bell then and there delivered to Mr. Hubbard to be filed at Washington was in a condition to be filed in the patent office. *It had previously been sworn to at Boston, January 20, 1876.*

But the language Mr. Hubbard unconsciously employed is even more significant than the obvious tenor of his words upon the surface. "Mr. Bell gave me *his* copy of the specification." Mr. Brown retained *his* copy and took it with him to England.

The presence at that interview with Mr. Brown of the verified fair copy of the American specification must be recognized as an established *fact*.

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*NOTE.—The interlineations appearing also in the certified copy of the American specification will be considered hereafter, where they will appear as another link in the remarkable chain of circumstances existing in this case.

It is not impossible indeed that this was the very occasion when the attorney, Mr. Pollok, also met Mr. Bell in New York, and they spent a day going over the specification with care, and when "no change whatever was made in it."

Mr. Bell felt that he had made a great invention, that he had invented what is now known as "the Speaking Telephone." He was so anxious to secure this invention by foreign patents that he delayed the filing of the American specification for months to further this purpose. He even continued this perilous delay against the earnest expostula- of his partner, Mr. Hubbard.

"Mr. Hubbard and Mr. Sanders were very anxious to have my specifications filed at once in the United States Patent Office, but I believed the invention to be so important and so valuable that I wanted it to be taken out abroad as well as in America, and, therefore, delayed the filing, hoping to hear from Mr. George Brown and his brother. (C. Vol. 2, p. 1678).

Mr. Hubbard says:

"I strenuously objected to the least delay, but it was of no avail, as he wished to have it taken out in his native country, *that he might there have the benefit of what he believed a great invention.*" (C. Vol. 4, page 961.)

If Mr. Bell had at that time in mind an alternative method of creating his "undulatory" current, by varying the resistance upon the circuit; if he had embodied a description of that method in his American specification, describing various ways of varying the power of the current in the production of "electrical undulations,"—if this was the fact, it surpasses the bounds of human credulity to suppose, even for a moment, that he would have withheld a like description of this alternative method from his foreign applications, when he had such abundant opportunities to insert it.

Yea, more, it is absolutely incredible that he would have permitted to remain in the foreign specification, a clause which, in express terms, excluded this alternative method from the domain of the patent.

The "George Brown specification" contains the statement: "There are many ways of producing undulatory currents of electricity, *but all of them depend for effect upon the vibration or motion of bodies capable of inductive action.*"

He had only to draw his pen through the words, "but all of them depend for effect upon the vibration or motion of bodies capable of inductive action." In plain terms, Mr. Bell was either then a fool or subsequently a knave. His proved pre-eminent intellectual abilities, manifested in every detail of the previous history, absolutely forbid the existence of the first alternative and force us to the conviction of the truth of the second.

XXII.

Crime breeds crime. A foul deed perpetrated in silence and in secrecy draws around a man an invisible line that separates him from his fellows. He is thenceforth set apart as the especial victim of circumstances. He is arrayed in a never-ending but unequal conflict with the terrible Nemesis of retribution. The stern necessity is laid upon him of unceasing vigilance, of daring unscrupulousness, and of reckless effrontery in the commission of further offenses, for only thus can he stave off the inevitable end.

Mr. Bell, notwithstanding his transcendent intellectual abilities, proved no exception to the rule. There is evidence in this record, ample, complete and demonstrative, that subsequent to the 10th day of April, 1879, a crime of the most atrocious character was committed in the patent office at Washington; that this was done for the sole purpose of covering up and concealing the evidences existing in that office of the crime previously perpetrated there in February 1876, as already outlined.

On pages 5 to 13, of Vol. 4, of complainant's record, there appears a copy of the original application filed by Mr. Bell, which was originally produced in evidence in the *Dowd* case, Feb. 14, 1876.

This is certified to be a true copy from the files of the patent office, in a certificate under the seal of the office, dated April 10, 1879, and signed by W. H. Doolittle, Acting Commissioner of Patents. Reading this copy of the specification carefully from the beginning, we are astounded when we find on page 9, that the specification reads as follows:

"*There are many ways of producing undulatory currents of electricity, but all of them depend for effect upon the vibrations or motion of bodies capable of inductive action.*"

A few of the ways are specified, and then follows the controverted passage, which had been interjected into the specification, describing methods of producing undulations by varying the strengthof the current.

But the passage quoted, which expressly excludes all methods not dependent upon induction, reads, *word for word, exactly as it appears in the George Brown specification.*

Here is an extraordinary phenomenon. The passage appears, as quoted, in the George Brown specification, delivered to Mr. Brown, in January, 1876. In the printed copy of the patent, issued March 7, 1876 (C. Vol 1, page 60), it reads as follows:

" *There are many ways of producing undulatory currents of electricity, dependent for effect upon the vibrations or motions of bodies capable of inductive action.*"

Again, April 10, 1879, it reads, as in the " George Brown specification." And once again, in a photolithographic copy of thr original application on file, produced by complainants (Additional Proofs, page 729), and certified to by M. V. Montgomery, Commissioner of Patents, October 30, 1885, it appears as shown in the printed copy of the patent.

What is the explanation of this juggle? These are stubborn *facts*, and they can not be ignored. The specification, as it was on file in April, 1879, *did read*, " but all of them depend for effect upon the vibrations or motion of bodies capable of inductive action."

Clerical and typographical errors are possible, but the mathematical ratios are millions to one against the substitution by error of the particular five words " but all of them depend " for the one word " dependent." But these five words are the identical words employed in the " George Brown specification." The chances are so incalculable against such a substitution by accident, that error is out of the question as an explanation. It must be recognized as a fact, that these words were actually in the original specification on file in the patent office, as it appeared on the 10th day of April, 1879.

But how could this specification have been printed on

March 7, 1876, with the word "dependent," instead of the words "but all them depend?"

The explanation is as follows:

As we have already been convinced, the passage relating to the production of undulations in the current by varying its power, was not in the original specification when it was filed in the patent office. By means of the conspiracy, the existence of which is an established fact, Mr. Pollok was at once made acquainted with the contents of Mr. Gray's caveat, filed upon the same day with Mr. Bell's application. Sometime between February 14, the day of the filing, and February 19, the day an interference was threatened by an official communication, Mr. Pollok, or some one in his office, through the connivance of the Examiner, effected secretly a substitution of a sheet or sheets in the original application, all being in the handwriting of his own clerk. Through this substitution he effected the introduction of the new passage, all excepting the first sentence, the printing of which in brackets in the certified copy shows it to be an interlineation. The new claim, based upon this passage, was also inserted.

When Mr. Bell shortly afterward arrived in Washington (C. Vol. 2, page 1680, Ans. 563), he of course perceived the incongruity displayed in the arrangement under the general head of the production of undulations by induction, of detailed methods of producing undulations by varying the power of the current, either in the battery or by varying the resistance upon the circuit.

He accordingly interlined the introductory sentence; [" Electrical undulations may also be caused by alternately increasing and diminishing the resistance of the circuit, or by alternately increasing and diminishing the power of the battery."] He also made a number of verbal changes in the specification as indicated in the brackets. The significant fact of these verbal interlineations having been made in the original "fair copy" is established by the document itself, the interlineations being printed in brackets to indicate their character as such, while the fact that the origina specification when filed was a fair copy has also been established by the testimony.

It is well known that at that time merely verbal or clerical corrections were freely permitted to be made in the patent office in this informal manner, to avoid the necessity of an official amendment in detail. The practice was to make these informal amendments in the examiner's room in pencilings upon the paper. Mr. Bell, of course, could not fail to note the inconsistency of the new passage with the words "but all of them depend for effect upon the vibrations or motion of bodies capable of inductive action," which, in the hurry of the secret substitution, had been overlooked. He accordingly drew his pencil through the words "but all of them depend" and interlined the word "dependent," thus making the passage read as it was printed in the patent.

One little circumstance is convincing to the mind, that Mr. Bell did not write originally the new passage inserted in the patent. It contains the following sentences:

"The external resistance may also be varied. For instance, let mercury or some other liquid form part of a voltaic circuit, then the more deeply the conducting wire is immersed in the mercury or other liquid, the less resistance does the liquid offer to the passage of the current."

As regards mercury, this is a false statement. Mercury will not operate at all in that manner. The metal mercury is, in fact, an excellent conductor of electricity, and the depth into which a conducting wire is dipped into it will make no appreciable difference in the resistance to the current upon the circuit. This characteristic property of mercury has led to its frequent use in connection with circuit breakers, to complete the circuit when the conducting wire dips into the mercury.

All this was perfectly familiar to Mr. Bell. In all his early experiments, in multiple telegraphy, mercury was employed to complete the circuit, and, as he states, "The oxidization of the mercury, too, was a source of great annoyance, and was only partially obviated by covering it with alcohol." (See *ante* page 21.) The good electrical conductivity of mercury was as well known and as familiar to Mr. Bell as the fact that fire burns and water flows, is to any child. It is simply impossible that Mr. Bell could have written such nonsense as the passage quoted.

But granting all this, yet how came the specification, as it was on file in April, 1879, to contain again the words, "but all of them depend?"

The explanation is the simplest in the world. Three years had elapsed; the specification had been handled time and again. It was one of the curiosities of the patent office. The pencilings of the word, "dependent" and of the line drawn across the words, "but all of them depend," lying in a fold, had become obliterated. The original words written in ink were once more clear and legible, and the clerk copied them.

Is there any other possible explanation?

But look at it from another standpoint. The fact that these five words "but all of them depend," were legible in the specification, in April, 1879, demonstrates that those words were originally written in that fair copy which was filed in the patent office February 14, 1876, whatever be the means or whatever the manner in which they were obliterated in March, 1876. Otherwise, those words could not have found an existence in that paper in April, 1879.

But the fact that the words, "but all of them depend" were in that fair copy, filed February 14, 1876, demonstrates the further fact that the new passage, so directly in conflict with those words, was not contained at that time in that copy. A man of Mr. Bell's intellectual abilities, having set before himself the high standard of scientific accuracy and completeness of expression in the preparation of this specification, could not have passed an entire day in its careful study and made no change whatever in it, if it had contained two such antagonistic passages. There is but one explanation possible. That new passage was not inserted in the specification until after Mr. Gray's caveat was filed in the patent office. This explanation fits in with every fact, and accords with every circumstance disclosed in the record. It clears up every mystery and satisfies the mind. It is the *truth*, for the truth alone can be in such perfect accord with every fact and every new development in the case.

But the *fact* that these five words, "but all of them depend" were legible in the specification on file in the patent office April 10, 1879, demonstrates another fact of ominous significance.

At the last moment, and during the printing of the record for this court, the complainants produced a photolithographic copy of the original specification, as it appeared in the files of the patent office, certified to by the Commissioner of Patents (Additional proofs, page 729), showing a perfect *fac simile* of each page of the specification. This document establishes the *fact* that the specification actually on file in the patent office October 30, 1885, the date of the certification, was *a clean, fair copy, without an erasure and without an interlineation,* except as indicated for the insertion of the official amendment of February 29, 1876, to which reference has already been made.

Not only is there an entire absence of the words, "but all of them depend," which were in the specification on file April 10, 1879, as shown by the certified copy of that date, but there is not even shown an erasure or interlineation in the context of the specification where those words once appeared. The writing here is as smooth and as straightforward as in every other place in the specification.

The startling fact is thus made manifest, that the papers have been changed in the office; that the specification on file April 10, 1879, is there no longer; that it has been withdrawn from the office and another paper substituted in its place.

A felony has been committed. Another crime has been perpetrated, to destroy the evidence of the commission of the first crime.

The one fact we have cited establishes the proposition. But cumulative evidence exists in abundance.

The original specification on file in the patent office on

April 10, 1879, was full of verbal corrections, as shown by the certified copy of that date. The copy of the specification on file in that office on October 30, 1885, shows not one of them, as demonstrated by the appearance of the photolithographic copy in evidence in this case.

We have already referred to the interlineation of the sentence, ("Electrical undulations may also be caused by alternately increasing and diminishing the resistance of the circuit, or by alternately increasing and diminishing the power of the battery"), as shown in the certified copy of April 10, 1879.

In the photolithographic copy this sentence is not interlined, but appears in its proper place, the same as any other sentence.

Another example, of a most striking character, must be cited.

The "George Brown specification" contains the following sentence (C. Exhibits, Vol. 4, page 939):

> "The vibrations represented by the sinusoidal curves A and B (Fig. IV) are in the ratio aforesaid, 4:5—that is, four oscillations of A are made in the same time as five oscillations of B."

By reference to "Fig. IV" in the drawing it will be seen that this is a correct description. Four lobes of the curve A occupy the same distance upon the horizontal line as five lobes of the curve B. In the certified copy of April 10, 1879, the sentence appears as follows (C. Exhibits, Vol. 4, page 8):

> "The vibrations represented by the sinusoidal curves B (A) and A (B), Figure 4, are in the ratio aforesaid of 4:5—that is, four oscillations of B (A) are made in the same time as five oscillations of A (B)"; the letters in the brackets being thus printed to indicate conventionally the erasures shown in the certified copy.

Turning now to the printed copy of the patent (C. Exhibits, Vol. 1, page 55), we find that the draughtsman, in making the drawing for the patent office, had lettered the curve named "A" in the "George Brown drawing," "B" in the patent office drawing; and likewise the curve formerly named "B" was now lettered as "A." The error was unnoticed in filing the original fair copy of the specification.

This clerical error, or rather the draughtsman's error, made necessary exactly the correction that was made in the specification, by erasing "A" and "B," and substituting "B" and "A," respectively, therefor. This gave "B" the unusual precedence over "A," apparent in the printed copy of the specification issued March 7, 1876.

But the photolithographic copy of the paper on file in the office October 30, 1885, shows no trace whatever of any such correction. This demonstrates the *fact* that this correction, which appeared on the face of the original specification on file in the patent office on April 10, 1879, *never was made in the paper now on file in that office.*

We can no longer resist the conviction forced upon us by these significant facts. The evidence is conclusive. Another and a different paper has been fraudulently and feloniously substituted for the original specification, filed in the patent office, February 14, 1876. It is clear that another crime has been committed in the execution of the foul conspiracy, and it only remains for the Government to discover and punish the guilty parties.

But the *fact* of the execution of this last felony *demonstrates* the commission of the original crime. It fastens upon Mr. Bell the infamy of having perpetrated the most gigantic fraud of the century.

But the proofs are by no means exhausted. The *truth* always fits in with every fact that can possibly be discovered, and is in entire accord with every occurrence that happens.

We have seen how Mr. Bell's previous history, when unfolded to view, afforded us a light which illumined the dark transactions of February, 1876. His subsequent history throws an even stronger light upon the subject.

All that has heretofore been regarded as inexplicable and difficult of comprehension in Mr. Bell's subsequent conduct and utterances is cleared of all mystery, and is plainly understood, now that we have in our possession the great central fact, around which every circumstance groups itself in orderly relation.

We have already seen that at the close of his labors in July, 1875, Mr. Bell discharged Mr. Watson, and abandoned for the time all further experiments upon the telephone.

When he was summoned to Washington, the latter part of February, 1876, he was actually exgaged in experimental work upon the autograph telegraph.

"During June and July, the speaking telephone was the thing to which I devoted my energies and all the applications of multiple telegraphy assumed only secondary importance. Few, if any, experiments relating to the autograph telegraph, or, indeed, to any electrical subject, were made between the end of July, 1875, and March 1876. At that time I was again working at the combination of instruments necessary to put my autograph telegraph into practical operation, as Mr. Hubbard and Mr. Sanders thought that it would prove the most immediately valuable of all my inventions." (Bell, C. Vol. 2, page 1666).

Immediately upon his return from Washington Mr. Bell resumed his experiments upon the telephone, made a liquid transmitter, and for the first time in his life obtained intelligible articulation, as appears from Mr. Watson's testimony already quoted at length.

He had gained new light upon the subject.

Mr. Bell added the following passage to his Preliminary Statement in Speaking Telephone Interferences. (C. Exhibits, Vol. 4, page 1011).

"I ought to state that *I did not, before the filing of my application,*" (February 14, 1876,) "*construct the devices described in my specification for varying the resistance* of a voltaic circuit as means for producing an undulatory current. *I was in Washington the first few days in March,* and *immediately on my return* I constructed an apparatus having a wire attached to a stretched membrane, dipping into a vessel containing water, forming part of a circuit, the resistance of the circuit, being varied by the vibration of the membrane, which caused the wire to dip more or less deeply into the liquid.

"On the 10th day of March, Mr. Watson and myself tried *this apparatus as a transmitter*, using *the steel spring armature depicted in my patent as receiver*, and obtained intelligible articulation. I exhibited an instrument constructed in this way at the Centennial Exhibition in June, 1876, before Sir William Thomson and other judges of his department."

A comparison of the description Mr. Bell here gives of this apparatus, with the similar description of a like apparatus contained in Mr. Gray's caveat, reveals unmistakably the *source* of the new light Mr. Bell had just gained.

"In the drawings, the person transmitting sounds is shown as talking into a box or chamber A, across the outer end of which is stretched a diaphragm *a*, of some thin substance, such as parchment or gold beater's skin, capable of responding to all the vibrations of the human voice, whether simple or complex. Attached to this diaphragm is a light metal rod A^1, or other suitable conductor of electricity, which extends into a vessel B, made of glass or other insulating material, having its lower end closed by a plug, which may be of metal, through which passes a conductor *b*, forming part of the circuit.

"This vesssel is filled with some liquid possessing high resistance; such for instance as water, so that the vibrations of the plunger or rod A^1, which does not quite touch the conducter *b*, will cause variations in resistance, and, consequently, in the potential of the current passing through the rod A^1." (C. Vol. 4, page 870.)

A rude sketch of this apparatus made by Mr. Watson appears in C. Exhibits, Vol. 1, page 313. A comparison of this sketch, with the drawing attached to Mr. Gray's caveat, shows that there was no substantial difference in the mode of operation in the two cases.

This apparatus was a transmitter. Mr. Bell next made a receiver, which also could be used both as a transmitter and a receiver in a magneto telephone. Mr. Watson testified regarding this instrument as follows (C. Vol. 1, page 324):

"*Cross-Int*. 224. When was the first time that you ever heard and understood words transmitted over a telephone line by means of a magneto transmitter? *Ans.* My recollection now is that I heard and understood words from a magneto transmitter shortly after March 10, 1876.

Cross-Int 227. That instrument had a membrane diaphragm, I suppose, had it not? *Ans.* I think it had.

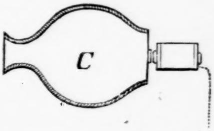
"*Cross-Int.* 228. Describe the armature, its size, shape, material and manner of attachment to the diaphragm in that instrument. *Ans.* All that I can remember about it is that it consisted of a piece of clock-spring shellacked to the membrane. I do not remember the dimensions at all.

"*Cross-Int.* 229. Was that the first magneto instrument which had a metal armature attached to and supported only by the diaphragm? *Ans.* It was the first I remember.

"*Cross-Int.* 230. Who made that instrument, and when? *Ans.* I think I did, just before it was tested.

"*Cross-Int.* 231. It was made after March 10, 1876, was it not? *Ans.* According to my recollection."

Here is the cut of Mr. Gray's receiver, as shown in the drawing attached to his caveat, and reproduced from the exhibit in the *Dowd* case just obtained.



The description given by Mr. Watson, as well as that given by Mr. Bell in the passage already quoted from his London Lecture, corresponds perfectly to this drawing. There can be no possible doubt as to where Mr. Bell obtained the idea of this construction. He would have given worlds for the possession of such a conception in the preceding June and July, and he had abandoned the work for want of it.

Everything points to a single conclusion. Mr. Bell stole the ideas set forth by Mr. Gray in his caveat. He appropriated those ideas to himself; first, by means of the new passage interjected into his patent; and secondly, by embodying them into the construction of instruments, both the varying resistance and the magneto, and instruments through which he for the first time transmitted articulate speech. *Mr. Bell stole the telephone from Mr. Gray, and such will be the verdict of history.*

Mr. Bell was compelled to add the passage already cited to his preliminary statement in the Speaking Telephone

Interferences, for that paper was, so to speak, to be his title deed in his contest with Mr. Gray. Besides, it would be filed in the secret archives of the patent office, and be inaccessible to the public.

But how did Mr. Bell treat the matter in his public utterance?

In his London Lecture, delivered October 31, 1877, Mr. Bell gave a connected history of his development of the telephone, from its first inception, through the successive steps, down to that date. Now, obviously, the most interesting point in the whole history was the hour of the final consummation of all his thoughts, and hopes, and labors; the hour, when, for the first time in his life, he had succeeded in the transmission of articulate speech. It was an hour of excitement, of exhileration, an hour never to be forgotten.

Turning now to that London Lecture, (C. Exhibits 4, page 879) and particularly to the passage already quoted, we find that Mr. Bell never mentioned that hour or a single circumstance connected with the occurrence. On the contrary, the language he employed was such as to naturally produce the impression that the first distinctly audible effects were obtained with magneto instruments, while, as a matter of fact, those instruments were constructed subsequently to the varying resistance transmitter with which he first obtained intelligible articulation.

Such conduct is no longer inexplicable. We now know that it was the discreet silence of one who held stolen property in his possession.

Other details might be mentioned, but time forbids. Every fact that shall be established, now or hereafter, can only fall into line and add its bit of confirmation. "The mills of the Gods grind slowly, but they grind exceeding fine."

It ~~it~~ is with heartfelt satisfaction that we are enabled to state our conviction that complainants present counsel are absolutely free from all complicity or connivance, either in the perpetration or in the attempted concealment of the frauds the commission of which has been so clearly established by the evidence in this case. Indeed, the character of this evidence, and the remarkable manner in which it has been introduced in the complainant's own record, preclude even the possibility of a question in this matter.

Under the circumstances, it is but a simple requirement of justice that this conviction should here find expression.

T. S. E. Dixon,

Of Counsel for the People's and Overland Telephone Companies.

AMERICAN BELL TELEPHONE

IONE COMPANY,-1

United States Circuit Court.

SOUTHERN DISTRICT OF NEW YORK.

AMERICAN BELL TELEPHONE COMPANY,

AND OTHERS,

VS.

PEOPLE'S TELEPHONE COMPANY,

AND OTHERS.

Defendants' Testimony in Answer to Complainants' Case.

REPRINT.

VOL. I.

HARRISBURG:
EDWIN K. MEYERS, PRINTER,
1886.

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PHONE COMPANY,-1

Circuit Court of the United States

SOUTHERN DISTRICT OF NEW YORK.

IN EQUITY.

The American Bell Telephone Company and the Metropolitan Telephone and Telegraph Company, Complainants,

vs.

The People's Telephone Company, Joseph Loth, Julius Bien, Marcus Marx, Auguste H. Girard, John N. Goodwin, Frank A. Klemm, Ernest Marx, Edgar W. Chellis, Richard C. McCormick, Henry D. Cooke, Jr., Max L. Gutmann, Moritz Loth, and Simon Wolf, Defendants.

The separate answer of The People's Telephone Company, one of the above-named defendants, to the bill of complaint of the American Bell Telephone Company and the Metropolitan Telephone and Telegraph Company, Complainants.

This defendant, now at all times hereafter saving and reserving unto himself all benefit and advantage of exceptions which can or may be had to the many errors, uncertainties, and other imperfections in the said complainants' said bill of complaint contained, for answer thereunto, or unto so much, and such parts thereof as this defendant is advised, is, or are, material or necessary for it to make answer unto, this defendant, separately answering, says:

1. This defendant admits that Letters Patent of the United States of

America, numbered 174,465, were granted and issued to Alexander Graham Bell, dated the seventh day of March, A. D. 1876, for an alleged invention in telegraphy, as in said bill of complaint alleged.

2. This defendant admits that Letters Patent of the United States of America, numbered 186,787, were granted and issued to said Alexander Graham Bell, dated the 30th day of January, A. D. 1877, for an alleged invention in Electric Telegraphy, as in said bill of complaint alleged.

3. This defendant has no knowledge that the complainant so-called corporations are duly established and authorized bodies corporate, or that either of them is a duly established and authorized body corporate, as in said bill alleged, and calls for due proof thereof.

4. This defendant has no knowledge of the several alleged assignments, grants, and licenses, referred to in said bill, by and through which the complainants pretend to have derived alleged rights from said Bell, directly or indirectly, as in the bill alleged, and calls for due proof of all and every thereof.

5. This defendant has no knowledge that the alleged inventions described in said Letters Patents, or either of them, was or were ever embodied in instruments known as Bell Telephones, or in instruments known as Blake Transmitters, or in any of such instruments as alleged in said bill, and therefore calls for due proof thereof.

6. On information and belief, this defendant denies that the said alleged inventions, described and contained in the said several letters patent here in suit, everywhere, or either of them ever was, introduced into general or extensive use in public; and, further, on information and belief, it says that the telephones heretofore introduced into general use, as referred to in said bill, were not of the same, nor substantially the same construction and operation, as the machines and instruments described in said letters patent, or either of them, but were of substantially different construction and mode of operation, and were not the same, but substantially different inventions. And, having no knowledge of the actual extent to which electric telephones have been, up to the filing of said bill, introduced into public use, it calls for due proof thereof, if such matter shall in anywise be or become material in this cause.

7. Save by hearsay and by the allegations of said bill, this defendant has no knowledge of the several suits alleged in the bill to have been instituted, nor of the several decrees or orders alleged to have

PHONE COMPANY,-1

been obtained or made therein, or of any of the alleged proceedings therein; but upon such information as it has been able to obtain, it charges that the said several suits were, and each of them was, collusive and fraudulent; that no proper defense was made to them, or any of them, and that the alleged proceedings, orders, and decrees therein, are and each of them is, of no force and effect, except as between the parties to said suit or suits and their privies.

8. Upon information and belief, this defendant denies that the patents upon which this suit is brought are good and valid patents, or that either of them is a good and valid patent; it denies that the validity of them, or either of them, has been generally recognized and acknowledged as in the bill alleged; and it denies that the claims of said Bell, of Gardiner G. Hubbard, of the complainants, and of their predecessors, to the exclusive right to said alleged inventions under said patents, have been generally acknowledged and acquiesced in as in the bill alleged. Further answering, this defendant says, that not only has the validity of said patents, and of the complainants' claims thereunder, not been generally acknowledged and acquiesced in, but that such fact is, and has long been, of great public notoriety; that it has long been notorious that Elisha Gray, of Chicago, Illinois; Thomas A. Edison, of Menlo Park, New Jersey; Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pennsylvania, and others, have claimed, and still do claim, each for himself, to be the original and first inventor of the inventions described, shown, and claimed in said two Bell patents, and in each of them; that it has long been notorious that, at the time when said patents were granted to said Bell, said Gray had a caveat on file in the United States Patent Office, and in full force and effect, describing and claiming the same invention, and that he, said Gray, ought to have been notified of the pendency of said Bell's application, and allowed to come into the Patent Office with an application and contest said Bell's right to a patent, and obtain a decision upon the question of priority of invention between himself and said Bell before the issue of any patent to either; but that his caveat was overlooked by the Commissioner of Patents, and the patent was unlawfully issued to said Bell without any notice to said Gray, or any opportunity for him to prove his own prior invention; that it has long been notorious that, for years past, interferences have been, and now are, pending undetermined in the Patent Office between said Bell, Gray, Edison, and many others, to determine who is the original and first inventor of

the matters described, shown, and claimed in said two patents here in suit, and in each of them respectively; that it has long been notoriously understood and believed that the owners of said Bell patents upon which this suit is brought are so well aware of the doubtfulness of their alleged rights thereunder that, although said Gray and his licenses, and said Edison and his licenses, have made, sold, and put into use all over the country large numbers of speaking telephones containing the alleged inventions, respectively, of said Gray, and of said Edison, and infringing the claims of said Bell patents, and are still making, selling, and putting into use large numbers of such infringing telephones, yet the complainants have never *bona fide* instituted and prosecuted to final judgment or decree a suit or suits therefor, but have allowed, and still allow, such extensive and notorious manufacture, sales, and use to continue undisturbed; that, further, it has long been, and still is, notoriously understood and believed, that the owners of the said Bell patents, distrusting the ultimate result of the said pending interferences, and fearing the decision or decisions of the Commissioner of Patents declaring the said Bell not to be the original and first inventor of the inventions shown in his safe patent or patents, have entered into an agreement and contract, or agreements and contracts, with said Gray, Edison, and others, or with their assignees, in writing, providing for the contingency of a decision of the Commissioners of Patents adverse to said Bell in said interferences, and of the decisions of the Courts adverse to said Bell's claims as the original and first inventor of the matters claimed in his said patents, or either of them, and arranging the terms and conditions upon which said Bell telephones shall be licensed by said Gray or by said Edison, respectively, in the event that said Gray or said Edison shall be adjudged the original and first inventor thereof; that the evidence of said interferences, and the proceedings therein, and of the exact terms, conditions, and provisions of said contract or contracts between said Bell, Gray, and Edison, or the respective owners of the alleged inventions claimed by said Bell, Gray, and Edison, respectively, is not in the possession and control of these defendants, or any of them, but of the said interfering applicants and patentees, and their assignees, and of the parties to said contract or contracts, and can be obtained only by an examination of said persons or parties, or by order of this Honorable Court.

9. Further answering, this defendant denies that the said first Bell

LEPHONE COMPANY,-1

patent, No. 174,465, is valid, and alleges, and answers, that it is invalid and void, for the following reasons, to wit:

A. Because the machine or instrument described, shown, contained, and claimed therein, is not a patentable invention, but is an inoperative, useless, and worthless device.

B. Because the said Alexander Graham Bell was not the original and first inventor or discoverer of any material and substantial part of the thing patented; but before his alleged invention or discovery thereof, the same, or substantially the same thing or things, had been invented and used by, and were known to the following-named persons, of and at the following-named places, to wit:

Elisha Gray, of and at Chicago, in the county of Cook, and State of Illinois.

Thomas A. Edison, of and at the village of Menlo Park, in the State of New Jersey, and at the city of New York, in the State of New York.

Daniel Drawbaugh, of and at Eberly's Mills, in the county of Cumberland, and State of Pennsylvania.

C. Because, in view of the state of the art at the time of the alleged invention of said Bell, the claims of said patent are too broad, covering inventions before made by others, and of which he was not, and his assigns are not, entitled to the exclusive use and enjoyment.

D. Because the said Bell, in obtaining said patent, surreptitiously and unjustly obtained a patent for that which was in fact invented by another, to wit: said Elisha Gray, who was using reasonable diligence in adapting and perfecting the same.

E. Because the said Bell, in obtaining said patent, surreptitiously and unjustly obtained a patent for that which was in fact invented by another, to wit: said Thomas A. Edison, who was using reasonable diligence in adapting and perfecting the same.

F. Because the said Bell, in obtaining said patent, surreptitiously and unjustly obtained a patent for that which was in fact invented by another, to wit: said Daniel Drawbaugh, who was using reasonable diligence in adapting and perfecting the same.

10. Further answering, this defendant denies that the said second Bell patent, No. 186.787, is valid, and alleges and answers that it is invalid and void for the following reasons, to wit:

A. Because the machine or instrument described, shown, contained, and claimed therein is not a patentable invention, but is an inoperative, useless, and worthless device.

B. Because the said Alexander Graham Bell was not the original and first inventor or discoverer of any material and substantial part of the thing patented; but before his alleged invention or discovery thereof, the same, or substantially the same thing or things, had been invented and used by, and were known to the following-named persons, of and at the following-named places, to wit:

Elisha Gray, of and at Chicago, in the county of Cook, and State of Illinois.

Thomas A. Edison, of and at the village of Menlo Park, in the State of New Jersey, and at the city of New York, in the State of New York.

Daniel Drawbaugh, of and at Eberly's Mills, in the county of Cumberland, and State of Pennsylvania.

C. Because, in view of the state of the art at the time of the alleged invention of said Bell, the claims of said patent are too broad, covering inventions before made by others, and of which he was not, and his assigns are not, entitled to the exclusive use and enjoyment.

D. Because the said Bell, in obtaining said patent, surreptitiously and unjustly obtained a patent for that which was in fact invented by another, to wit: said Elisha Gray, who was using reasonable diligence in adapting and perfecting the same.

E. Because the said Bell, in obtaining said patent, surreptitiously and unjustly obtained a patent for that which was in fact invented by another, to wit: said Thomas A. Edison, who was using reasonable diligence in adapting and perfecting the same.

F. Because the said Bell, in obtaining said patent, surreptitiously and unjustly obtained a patent for that which was in fact invented by another, to wit: said Daniel Drawbaugh, who was using reasonable diligence in adapting and perfecting the same.

11. Further answering, this defendant says that Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pennsylvania, was and is the original and first inventor and discoverer of the art of communicating articulate speech between distant places by voltaic and magneto electricity, and of the construction and operation of machines and instruments for carrying such art into practice; that long prior to the alleged inventions by said Alexander Graham Bell, and long prior to the respective inventions of said Gray and said Edison, said Daniel Draw

baugh, then and now residing at said Eberly's Mills, constructed and operated practical working electric speaking telephones at said Eberly's Mills, and exhibited their successful operation to a great number of other persons resident in his vicinity and elsewhere; that the said electric speaking telephones, so constructed and successfully and practically used by him, as aforesaid, contained all the material and substantial parts and inventions patented in said patents No. 174,465 and No. 186,787, granted to said Bell; and also contained other important and valuable inventions in electric and magneto telephony, and were fully capable of transmitting, and were actually used for transmitting, articulate vocal sounds and speech between distant points by means of electric currents; that some of the original machines and instruments invented, made, used, and exhibited to many others, long prior to the said alleged inventions of said Bell, or either of them, are still in existence, and capable of successful practical use, and are identified by a large number of persons who personally tested and used, and knew of their practical operation and use, in the years 1870, 1871, 1872, 1873, 1874, and both subsequently and prior thereto; that certainly more than fifty, and probably not less than one hundred persons, or even more, were cognizant of said Drawbaugh's invention and use of said telephones, and of his claim to be the original and first inventor thereof, prior to the alleged invention of said Bell, or either of them; that said Drawbaugh, for more than ten years prior to the year 1880, was miserably poor, in debt, with a large and helpless family dependent upon his daily labor for support, and was, from such cause alone, utterly unable to patent his said invention, or caveat it, or manufacture and introduce it upon the market; that said Drawbaugh never abandoned his said invention, nor acknowledged the claims of any other person or persons thereto, but always persisted in his claims to it, and intended to patent it as soon as he could procure the necessary pecuniary means therefor; that said Drawbaugh never acquiesced in the public use of said Bell, Gray, Edison, Blake, or other telephones, nor in the claims of the alleged inventors thereof, nor gave his consent to such use; and that, in view of the facts aforesaid, neither said Bell nor any other person or persons whatever, except the said Drawbaugh, can now obtain a valid patent therefor, nor are the patents granted to said Bell as aforesaid, or either of them, of any validity or value whatever.

12. Further answering, this defendant says that the said Daniel Drawbaugh, after making, testing, using, and extensively exhibiting his in-

vention to others, and allowing them experimentally to personally test and ascertain its successful practical operation and utility, as aforesaid, and after the full and repeated demonstration of its successful working, as aforesaid, conceived that its range and capacity of usefulness to the public might be very greatly enlarged; that many improvements of great value might be made and added to it which, without departing from its principle, might increase its value to himself and to the public, and therefore set himself at work to discover and invent such improvements; that he discovered and invented some of said additional improvements prior to any alleged invention by the said Bell; and that, notwithstanding his embarrassed and impoverished pecuniary condition, and his utter want of proper mechanical tools, materials, and appliances to conduct such work, he labored with all reasonable diligence to perfect and adapt his said improvements, and did finally, in due exercise of such reasonable diligence, perfect and adapt the same; and that, in so far as the said Bell has incorporated such improvements in his said two patents, or either of them, he, the said Bell, has surreptitiously and unjustly obtained a patent or patents for that which was in fact first invented by said Drawbaugh, who was using reasonable diligence in perfecting and adapting the same; and therefore the patent or patents of the said Bell therefor is, or are, invalid and void.

13. Further answering, this defendant says that it has, by purchase, and for a valuable consideration, acquired the right, title, and interest of said Daniel Drawbaugh in and to all his said inventions, discoveries, and improvements in electric speaking telephones, and has full right, at law and in equity, to make, sell, and use electric speaking telephones, embodying the inventions, discoveries, and improvements of said Drawbaugh, without interference from or molestation by said Bell or his assigns, and without liability to these complainants therefor.

14. Further answering, this defendant says that it has, in good faith, and relying upon its legal rights aforesaid, caused applications to be made and filed in the Patent Office for letters patent upon the inventions of the said Daniel Drawbaugh, with the intention of procuring interference proceedings to be instituted, in accordance with the statute, against the patents of said Bell, and the pending applications of said Gray, Edison, and others, in order that said Drawbaugh may be adjudged by the Commissioner of Patents to be, as he rightfully is, the original and first inventor of the electric speaking telephone, and may be adjudged entitled to receive a patent or patents therefor.

15. This defendant, further answering, denies all and all manner of unlawful conspiracy and confederacy with other persons and parties as charged in the complainants' bill of complaint; denies all knowledge of the alleged newspaper publications referred to in said bill, and calls for due proof of said alleged publications, if the complainants shall be advised that they are of any materiality to this suit, which this defendant denies; and denies all the allegations of the complainants' bill as to the said Drawbaugh invention, and, particularly, the allegations that said Drawbaugh's invention was a mere experiment, was incomplete, imperfect, unfruitful, and that knowledge of it was withheld from the public, except so far as disclosed by said alleged newspaper publications in said bill mentioned and set forth. And this defendant charges that the contrary of all said allegations is true; that this defendant has done no unlawful or inequitable act in the premises; that it is not responsible for said alleged newspaper publications; that said Drawbaugh's original invention was complete, successful, operative, and practically and successfully operated, and reduced to practice as a "Speaking Telephone" on many occasions in the presence and hearing of many other persons, and knowledge thereof was freely communicated to the public by said Drawbaugh; and that said Drawbaugh's improvements, additional to his said original invention, were complete, successful, and practical inventions; that all of his said inventions were fully reduced to practice and communicated to others; but that said other persons, having knowledge of his legal and equitable right in and to his said inventions, and respecting and acquiescing in the same, desisted and refrained from making and using his said inventions, and acquiesced in his right thereto, and never did, so far as this defendant is informed and believes, any act to impair his said rights or which would prevent the grant of a good and valid patent or patents to him, the said Daniel Drawbaugh, or his assigns, for any or all of his said inventions.

16. This defendant, further answering, says that so far and to such extent as electric speaking telephones were put on sale and into public use in this country, by others than said Drawbaugh, prior to said Drawbaugh's application for a patent thereon, as aforesaid, such specific machines and instruments, so put on sale and into public use, were not the specific machines and instruments invented by said Drawbaugh, as aforesaid, but were machines and instruments invented by others, subsequently to the original and first invention of the electric speaking telephone by said Drawbaugh, and subsequently to the invention of

his said improvements thereon, as aforesaid; and that, as this defendant is informed and believes, such machines and instruments were so put on sale and into public use, not from or by reason of any information derived from or through said Drawbaugh, but by an independent invention, or independent inventions thereof, by others subsequently to said Drawbaugh's original and first invention as aforesaid, and while said Drawbaugh was unable, by reason of his poverty and other controlling circumstances, as above set forth, to patent his said inventions; and that such public use and sales were without the consent, allowance, or acquiescence of said Daniel Drawbaugh.

And this defendant, as advised by its counsel, further answers and says, that the alleged invention of the electric speaking telephone by said Bell, subsequently to said Drawbaugh's invention thereof, as aforesaid, conferred upon said Bell, or his assigns, no legal right to a patent or patents thereon, nor did it impair the legal right of said Drawbaugh to a patent or patents upon his own prior inventions; and that the alleged public use and sales of such subsequently invented telephones, without said Drawbaugh's consent, allowance, or acquiescence as aforesaid, and by reason of knowledge and information of their construction and operation, not derived from or through said Drawbaugh, have in law no effect to forfeit or bar said Drawbaugh's right to the exclusive use of his own prior invention, nor to prevent him or his assigns from obtaining a valid patent or valid patents thereon.

17. This defendant, further answering, says that it is not informed, save by the complainants' bill, whether such alleged public sales and the use of the Bell telephones, and other electric speaking telephones, was for more than two years prior to the filing of said Drawbaugh's application for letters patent upon his own prior inventions as aforesaid, and therefore it calls for due proof thereof; but it denies that any telephones so sold or used were the specific machines or instruments invented by said Drawbaugh as aforesaid, or were put on sale or into public use with the consent, allowance, or acquiescence of said Drawbaugh; and, therefore, as advised by its counsel, it denies that such alleged public use or sale, even if for more than two years before said Drawbaugh's application for a patent upon his invention, (of which it calls for due proof,) will operate in law to confer any rights upon said Bell, or upon the public, or to bar said Drawbaugh from obtaining a valid patent or patents upon his said invention or discovery.

18. This defendant denies that it has ever infringed the said two patents, No. 174,465, and No. 186,787, here in suit, or either of them.

19. This defendant, further answering, denies each and every allegation, statement, and charge of the complainants' bill of complaint, except such as are herein above specifically admitted to be true, and except such as are herein-above expressly declared not to be within the knowledge or information of this defendant; and of all the latter it calls for due proof.

UNITED STATES OF AMERICA, }
State of New York. } *ss.*
County of New York. }

Personally appeared before the undersigned, a notary public in and for said county and State, Richard C. McCormick, who, being duly sworn, deposes and says, that he is president of said The People's Telephone Company; that he has read the foregoing answer by him subscribed, and knows the contents thereof; that all the matters therein stated as the acts of said corporation he knows to be true; that all other matters therein stated he believes to be true.

Sworn to and subscribed before me this day of December, 1880.

AMERICAN BELL TELEPHON

PHONE COMPANY,-1

Circuit Court of the United States

SOUTHERN DISTRICT OF NEW YORK.

IN EQUITY.

The American Bell Telephone Company and the Metropolitan Telephone and Telegraph Company, Complainants,

VS.

The People's Telephone Company, Joseph Loth, Julius Bien, Marcus Marx, Auguste H. Girard, John N. Goodwin, Frank A. Klemm, Ernest Marx, Edgar W. Chellis, Richard C. McCormick, Henry D. Cooke, Jr., Max L. Gutmann, Moritz Loth, and Simon Wolf, Defendants.

The separate answer of
one of the above-named defendants, to the bill of complaint of the American Bell Telephone Company and the Metropolitan Telephone and Telegraph Company, Complainants.

This defendant, now and at all times hereafter saving and reserving unto himself all benefit and advantage of exceptions which can or may be had to the many errors, uncertainties, and other imperfections in the said complainants' said bill of complaint contained, for answer thereunto, or unto so much, and such parts thereof as this defendant is advised, is or are material or necessary for him to make answer unto, this defendant, separately answering, says:

1. He admits the issue of the complainants' patents, as stated in the bill of complaint.

2. He denies that he has ever infringed said patents or either of them.

3. He denies all and all manner of unlawful conspiracy and confederacy with other persons or parties, as charged in the bill of complaint.

4. He has no knowledge whether the complainants are, or either of them is, duly and legally incorporated, and calls for due proof thereof.

5. He has no knowledge whether said patents, No. 174,465 and No.

186,787, are, or either of them is, the exclusive property of the complainants, or either of them, and calls for due proof thereof.

6. He denies the validity of both and each of said two patents here in suit, for the following reasons, to wit:

I. Because the said Bell was not the original and first inventor or discoverer of any material and substantial part of the things so patented, or either of them, but the same thing and things had been, before his supposed invention and discovery thereof, invented by and known to Daniel Drawbaugh, of and at Eberly's Mills, in the county of Cumberland, and State of Pennsylvania, invented by and known to Elisha Gray, of and at Chicago, in the county of Cook, and State of Illinois, and invented by and known to Thomas A. Edison, of and at the village of Menlo Park, in the State of New Jersey, and at the city of New York, in the State of New York.

II. Because said Bell surreptitiously and unjustly obtained both and each of said patents here in suit for that which was in fact invented by others, to wit, said Elisha Gray, said Thomas Edison, and said Daniel Drawbaugh, respectively, who were each using reasonable diligence in adapting and perfecting the same and each of the same inventions.

7. As to all other matters and things stated and charged in the bill of complaint, and not herein-above expressly referred to and specifically answered, this defendant adopts the answer filed in this cause by the People's Telephone Company, which he believes to be true, and prays that it may be read in connection with this answer, and as a part thereof.

UNITED STATES OF AMERICA,
State of } *ss:*
County of

Personally appeared before the undersigned, a notary public in and for said county and State, the above named

, who, being duly sworn, deposes and says: That he has read the foregoing bill by him subscribed, and knows the contents thereof; that all the matters therein stated of his own knowledge are true, and that all matters therein stated on information and belief he believes to be true.

Sworn to and subscribed before
me, this day of December, 1880.

UNITED STATES CIRCUIT COURT,

SOUTHERN DISTRICT OF NEW YORK.

IN EQUITY.

AMERICAN BELL TELEPHONE COMPANY, *et al.*
vs.
PEOPLE'S TELEPHONE COMPANY, *et als.*

PLEASE TAKE NOTICE, that witnesses will be examined and testimony taken before a competent officer, in behalf of the defendants in the above entitled suit at the office of Frederick M. Ott, No. 4 N. Third street, Harrisburg, Pennsylvania. The examination will commence at 11 o'clock, A. M., on the twelfth day of April, A. D., 1881, and be continued pursuant to adjournment.

Dated New York, April 8, 1881.

Yours, &c.,
GEORGE HARDING,
Solicitor for Defendants.

To DICKERSON & DICKERSON,
Solicitors for Complainants.

[ENDORSEMENT.]

Service of the within notice is hereby admitted.

Dated New York, April 8, 1881.

DICKERSON & DICKERSON,
Solicitors for Complainants.

AMERICAN BELL TELEPHON

PHONE COMPANY,-1

[STIPULATION.]

UNITED STATES CIRCUIT COURT,

SOUTHERN DISTRICT OF NEW YORK.

IN EQUITY.

AMERICAN BELL TELEPHONE COMPANY, *et al.*
vs.
PEOPLE'S TELEPHONE COMPANY, *et als.*

It is hereby stipulated and agreed, that Frederick M. Ott, Notary Public, of Harrisburg, State of Pennsylvania, be appointed Special Examiner, to take testimony in the above entitled suit, at said Harrisburg.

Dated New York, April 8, 1881.

DICKERSON & DICKERSON.

AMERICAN BELL TELEPHON

PHONE COMPANY,-1

United States Circuit Court

SOUTHERN DISTRICT OF NEW YORK.

IN EQUITY.

American Bell Telephone Company *et al.*

VS.

People's Telephone Company *et als.*

EVIDENCE FOR RESPONDENTS,

Taken pursuant to the sixty-seventh rule of the Supreme Court of the United States in equity, as amended, before me,

FRED. M. OTT, *Examiner.*

Present, J. J. Storrow, Esq., for complainants, and M. W. Jacobs' Esq., and L. Hill, Esq., for respondents.

Counsel for respondents offer the following testimony:

Mr. Hill submits a stipulation providing for the appointment of Frederick M. Ott special examiner in this suit, and asks to have it made a part of the record.

ABRAHAM B. SHANK, *being produced, affirmed and examined, saith in answer to interrogatories, the defendant's counsel requesting to have the depositions taken orally, by questions and answers:*

Q. 1. State your age, residence, and occupation.

A. My residence is in Cumberland county, Pennsylvania; I am forty-nine; have been constable of Lower Allen township, Cumberland county, Pa., for the last seventeen years.

Q. 2. Are you acquainted with Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pa.?

A. Yes, sir.

Q. 3. How long have you known him?

A. Near thirty years.

Q. 4. Do you know anything about his having invented an electric talking machine? If yea, state when and under what circumstances you first had any knowledge on that subject.

A. Well, I know that he had one, and it was about in 1869 when I first saw it.

Q. 5. How came you to see it at that time?

A. Well, I was collecting taxes, and a good many folks were working there and I was back and forward pretty often; he was back with his taxes—that is Daniel Drawbaugh was back with his taxes a good bit.

Q. 6. Where did you see the instrument at that time?

A. In the machine shop—the shop where he had been working.

Q. 7. Do you mean Drawbaugh's shop, at Eberly's Mills, near his house?

A. Yes, sir.

Q. 8. In what place within that shop did you see the instrument or instruments at that time?

A. Well, in a small room where he had—where he had his things in.

Q. 9. Did you at that time talk through the instrument or hear anybody talk through it?

A. Yes, sir; Daniel Drawbaugh talked through it.

Q. 10. State whether you were in the same room with him when he talked through it or in a different room.

A. It was a different room.

Q. 11. Were the two rooms, namely, the one in which he was and the one in which you were, on the same floor of the shop or on different floors?

A. On the same floor, the first time he spoke to me; another time, then, it was on another floor.

Q. 12. Were the two rooms at the time when he first spoke to you through the instrument adjoining each other, or was there a room or rooms between them?

PHONE COMPANY,-1

A. There was two rooms adjoining each other.

Q. 13. What kind of a partition was there between the two rooms?

A. A board partition.

Q. 14. Was there a door in the board partition between the two rooms?

A. Yes, sir.

Q. 15. Was the door open or closed while he was talking and you listening at the machine?

A. Well, I think it was closed; I ain't just positive, but I think it was closed.

Q. 16. At that time, how far was the instrument at which you listened from the instrument at which he talked?

A. Well, I would suppose it was about twenty feet—I really don't know how long that shop is; I never paid particular attention.

Q. 17. Were the two instruments in any way connected—and if so, how?

A. Yes, sir; they were connected with wire—I took it to be wire.

Q. 18. What was the appearance of the wire?

A. Well, they—it was a—the wire was wrapped; it was wrapped wire—plain wrapped wire.

Q. 19. How many wires were there?

A. There were two wires.

Q. 20. Do you mean that the two instruments were connected by two wires?

A. Yes, sir.

Q. 21. Did you hear through the instrument anything that Mr. Drawbaugh said at that time?

A. Yes, sir.

Q. 22. Could you understand what it was that he said?

A. Yes, sir.

Q. 23. Could you distinguish Drawbaugh's voice through the instrument so as to recognize it as his voice, and not the voice of some other person?

A. Yes, sir.

Q. 24. Did you have any conversation with Mr. Drawbaugh at that time about the invention?

A. No, sir.

Q. 25. Do you remember whether at that time you saw any electrical batteries connected with the machines or wires?

A. No, sir; not as I mind.

Q. 26. Did you understand at that time whether the instrument worked by electricity or not?

A. No, sir.

Q. 27. When did you next see the machines, or similar machines, at Mr. Drawbaugh's shop?

A. Well, it was about two, three, or four years after that: I saw him with another machine.

Q. 28. Referring now to the last-mentioned machine, was Daniel Drawbaugh present when you first saw it?

A. Yes, sir.

Q. 29. Did you hear any conversation through this last machine when you first saw it?

A. Yes, sir.

Q. 30. Who talked through it?

A. Daniel Drawbaugh.

Q. 31. Were he and you in the same room or different rooms while he was talking through it?

A. He was up stairs and I was in another floor down stairs—the next floor to it.

Q. 32. How far were you from him while the talking was going on through the instrument?

A. Well, that I can hardly answer. I don't know how long the shop is—how high the ceiling is. It may be twenty-five or thirty feet. feet. I really couldn't tell that.

Q. 33. Were you in the same or opposite ends of the shop?

A. Well, he was on the north side of the shop up stairs and I was on the south side of the shop down stairs.

Q. 34. Was the instrument at which he talked and the one at which you listened connected in any way, and if so, how?

A. Yes, sir; they were, with wires.

Q. 35. What was the appearance of the wires, and how many wires were there?

A. Well, there were two wires—that is, the same wires as was on the first machine. The same kind of wires.

Q. 36. Could you hear and understand what he said through the instrument?

A. Yes, sir.

Q. 37. Could you distinguish the character of his voice through the

PHONE COMPANY,-1

instrument so as to distinguish between his voice and the voice of somebody else?

A. Yes, sir.

Q. 38. Were the places where he was and where you were, while he was talking through the instrument, so situated that you could hear conversation from one place to the other without the aid of the instrument?

A. No, sir.

Q. 39. Can you describe that instrument at which you listened at this time last referred to?

A. I can't describe it, but I know the machine if I see it.

Q. 40. Did you place it to your ear in listening to his voice?

A. Yes, sir.

Q. 41. Do you remember the fact of M. M. Grove, Wilson Bear, Jacob Kline, and J. A. Moore, under the firm name of M. M. Grove & Co., manufacturing axles for some time at Daniel Drawbaugh's shop?

A. Yes, sir.

Q. 42. Was it before or after said firm commenced the manufacture of axles at said shop, that you saw this last mentioned machine or machines, and heard Mr. Drawbaugh talk through it, from one floor to another, as you have testified?

A. It was just about the time the company got into operation—the axle company.

Q. 43. At that time did you see the instrument into which Mr. Drawbaugh talked?

A. Well, I didn't pay much attention to that; more so to the one I listened at.

Q. 44. Did you have any conversation with Mr. Drawbaugh about the invention at the time when he showed you this last mentioned machine, as you have testified?

A. Yes, sir.

Q. 45. What did he then say about it?

A. Well, he said a good bit about it then; had an argument on it; yes, sir, he said it was the greatest invention ever was known; if he, that is, if he had the means to go on with it, he said they could talk, or rather be a time to come, as to talk to the old country same as we talk here. Then I asked the question how the wires could be made across the ocean. He says they would have to be sunk to the bottom and the argument was with me, as the ocean had no bottom at some places, they said. That is about all we had then on those things, just at that time.

Q. 46. Did he at that time state how the machine operated—that is to say, whether by electricity, magnetism, or otherwise?

A. He said it works by electricity.

Q. 47. Did you at that time see any batteries connected with the machine or wires?

A. I seen batteries; yes, I didn't pry into that hardly; it had some stuff in it; I don't know what they were, though.

Q. 48. How did you know they were batteries?

A. Well, he showed them to me—that is Daniel Drawbaugh showed them to me.

Q. 49. What did he say about them and their use?

A. Well, I hardly know what he said any more.

Q. 50. Did he explain what they were for?

A. Well, that I can't answer; he did explain it, but I can't answer what he said to it. Then he—at the same time—he showed me these steel magnets—I don't know what he was going to do with them. He said, "I am going to experiment more and more with them—them machines." I didn't see them machines that he was alluding to at that time.

Q. 51. What kind of magnets were those that you last referred to?

A. Well, they were both made out of steel, I suppose, and they were these magnets—you can see them in the stores.

Q. 52. What was the shape of these magnets?

A. Well, I hardly can tell you—shaped like this: [*Witness here makes a mark like a letter U.*]

[*Mr. Hill hands the examiner an instrument to be marked for identification, and which will be offered in evidence hereafter. Examiner marks the instrument with the letter "A" and his initials, "F. M. O."*]

Q. 53. Please examine the instrument, which I now hand you, and which the examiner has just marked with the letter "A" and his initials, and state whether you ever saw it before, and if you did, state when and where you first saw it?

A. Yes, sir; I saw it at the time; just about when the axle company came into operation—in about '73 or '74—in about that time; in '73 or '74 I saw this; he spoke through this—talked through this, at Daniel Drawbaugh's shop.

Q. 54. Did you talk through this at the time, about which you have

PHONE COMPANY,-1

testified, when Drawbaugh was on one floor and you on the floor just below, or was it at some other time?

A. He talked through this—Daniel Drawbaugh—it was at that time.

Q. 55. Is this the instrument into which he talked or the one at which you listened?

A. This is the one he talked in.

Q. 56. How did the instrument at which you listened compare with this?

A. Another machine—I can't identify that machine rightly.

Q. 57. Was the instrument which you held to your ear an instrument shaped like this or differently shaped?

A. I think it was differently shaped; I can't recollect that any more.

Q. 58. At the time when you first saw any talking machine at Drawbaugh's shop, what was the appearance of the machine into which he talked?

A. Well, that is the first machine. The first machine was a glass tumbler. There was a mouthpiece, or whatever they call it, to it, and the tumbler was well lined with something; I don't know what they might call it—glazed.

Q. 59. What was the color of the lining in the tumbler?

A. White.

Q. 60. Did you look into the mouthpiece to see what was inside of it?

A. Yes, sir.

Q. 61. What did you see?

A. Well, I didn't see much—there was a water or liquid and a bladder or cover over it.

Q. 62. Where was the bladder or cover?

A. Well, it was right over the inside; I can't tell you; I can better show you than tell.

Q. 63. Please examine the glass which I now hand you, and which the examiner will please mark with the letter "F" and his "initials," and state whether you ever saw it before, and if so, what is it?

A. Yes, sir; I saw this; this was the first I saw of his invention.

Q. 64. The bottom of the tumbler appears to be gone now; what was its condition when you first saw it?

A. It was whole. I wouldn't positively say it was whole, either, because it was covered over with other things—tin—there was a bladder here, but I am confident it was a whole tumbler when I saw it.

Q. 65. Where was the bladder applied to this tumbler?

A. Here, [indicating the larger end of the tumbler,] the mouthpiece was put on so, [indicating and putting the mouthpiece over the large end]. You could look in through the mouthpiece and see the water through the bladder; the bladder was clear, so you could see through it.

Q. 66. Please look at the instrument which I hand you, and which the examiner will please mark with the letter "B" and his "initials," and state whether you ever saw it before, and if you did, state when and where you first saw it?

A. Yes, sir; I saw that machine at Daniel Drawbaugh's shop about the same time I saw that, in 1869, [pointing to tumbler "F."]

Q. 67. Was this machine, marked "B," a part of the apparatus which Mr. Drawbaugh showed you the first time you saw his talking machine operate?

A. Yes, sir.

Q. 68. Into which of these two machines did Drawbaugh talk and at which did you listen?

A. In 1869 he talked in that, [pointing to tumbler "F;"] I listened at "B," but it is not fixed at all as it was then.

Q. 69. Did the machine "B" then have this green tin tube?

A. Yes, sir; and also the lining inside.

Q. 70. Do you remember whether or not there was anything over the end of the tube next to the coiled wires?

A. It was a bladder over that, placed some way; it looked like a bladder.

Q. 71. Was there anything on it like these coiled wires which I now point to [indicating the electro-magnet]?

A. Yes, sir.

Q. 72. At the time, afterwards, when you saw this machine, marked "A," did you see this apparatus, marked "F," or anything like it?

A. I didn't at that time; that was done away with then.

Q. 73. How did you fix the time when you first saw these two machines marked "F" and "B?"

A. Well, I lived about a mile from Eberly's Mills, or from the machine shop, at that time—in '69; I moved spring of '70 to where I reside now—that is south of Shiremanstown—about two miles and a half from the shop now; I bought the property that spring; then after that I wasn't at the shop still for some time then.

PHONE COMPANY,-1

Q. 74. Do you mean that you bought the property where you now reside in the spring of 1870?

A. Yes, sir.

Q. 75. Did you take a deed of that property?

A. Yes, sir.

Q. 76. Have you that deed with you?

A. Yes, sir.

Q. 77. Will you please produce that deed in order that the examiner may certify the date of it? (Deed produced and handed to Mr. Storrow for examination.)

[*The examiner certifies that the deed is dated February the third, A. D.* 1870, *and is acknowledged the same day, it being a deed from Jessie Berkheimer and Eliza, his wife, to A. B. Shank, acknowledged before Joseph Leas, Justice of the Peace for Cumberland county, Pennsylvania, and unrecorded.*]

Q. 78. How long after the date of that deed did you move to the purchased land?

A. The same spring.

Q. 79. Now, am I to understand that before you moved on to that land you saw these two instruments, "F" and "B," and heard Mr. Drawbaugh talk through them, as you have testified?

A. Yes, sir.

Q. 80. About how long before you moved on to that land, to the best of your knowledge?

A. Nearly a year—near as I can say.

Adjourned until the following morning, at nine o'clock.

April 20, 9 A. M.

The examiner resumed.

Present, same counsel as yesterday, and also Mr. Chauncey Smith, for complainants.

Q. 81. Please examine the apparatus which I now show you, and which the examiner will mark with the letter "C," and state whether you ever saw it during any of your visits to Mr. Drawbaugh's shop?

A. I did. I saw this same time. I couldn't precisely set the time. I saw all those machineries of the first, and this was one of the first, and it was in about the same condition as it is now.

Q. 82. Then you saw this before you saw the instrument marked "A"—is that the fact?

A. Yes, sir.

Q. 83. Between the time when you moved to your present residence and the time when you saw the instrument marked "A," did you visit Mr. Drawbaugh's shop at all?

A. Yes, sir.

Q. 84. How frequently?

A. As near as I can state, about half a dozen times a year; some years oftener.

Q. 85. Prior to moving to your present residence, were you at Mr. Drawbaugh's shop more or less frequently than afterwards?

A. I was there pretty much all rainy days—that is, before I moved where I live now.

Q. 86. During any of your visits to Mr. Drawbaugh's shop, as you have testified, did you at any time see the device which I now hand you, and which the examiner will please mark with the letter "I" and his initials.

A. Yes, sir; I saw this different times about the—about his other machineries.

Q. 87. What do you mean by "about his other machineries?"

A. Well, he would show me his other patterns,—well, he would show—he still working at other machineries.

Q. 88. Other machineries for that?

A. Well, he was working at this here telephone, or what you might call it—speaking machine, he called it.

Q. 89. What is your impression as to the time when you saw the apparatus marked "I," which you hold in your hand?

A. Well, I couldn't—couldn't hardly set the time on this.

Q. 90. At any time when you were at Mr. Drawbaugh's shop, as you have testified, did you speak through the instrument while he listened?

A. Yes, sir; sometimes.

Q. 91. When was that?

A. Well, I couldn't fix the date on that. Some time in '73 and '74, to the best of my knowledge.

Q. 92. Is there any instrument here, in your sight, that was used at the time when you spoke and he listened?

A. Well, I hardly can identify more than that tumbler and the green box he had at the same time he was talking through it.

Q. 93. Do you remember whether or not the instrument marked "A" was used by him or by you when you were speaking and he listening?

A. It was used by him when he was listening, at the time, and also I tried to listen at the other machine, or rather at another machine; I couldn't identify which one it was.

Q. 94. Did you at any time use this machine marked "A" for listening?

A. Yes, sir.

Q. 95. When was that?

A. Well, I can't just set the time, or remember when it was. He had different machines.

Q. 96. How many times did you see this instrument marked "A" in use at his shop?

A. Well, I couldn't recollect; about a couple of times.

Q. 97. You stated yesterday that the first time when you saw this instrument marked "A" in use was about the time when the axle company commenced business at the place. Could you state any more definitely whether it was just before or just after they commenced business?

A. It was just about that time, or rather a little before.

Q. 98. You have stated that this instrument marked "A" was used at one time, when you were present, by Mr. Drawbaugh to speak into; and, again, you have testified that it was used at one time to listen at; state whether you are, or are not, sure about its being used both for speaking into and for holding to the ear to listen at?

A. Well, I was wrong; I know that I had it to my ear. After I thought over it, as I had that to hold to my ear. After I studied over it, I knew that was the one I listened at.

Q. 99. State whether anybody suggested to you that you were wrong in saying that the instrument marked "A" was used to talk into, or did your memory correct you without any suggestion from others.

A. Without any suggestion at all from any others.

Q. 100. You testified yesterday that, at one time, Mr. Drawbaugh made some remark about means—if he had the means—or something to that effect; please state all that you heard him say at any time when he was showing you the talking-machines, or speaking about them, that had reference to his pecuniary means or want of means?

[*Objected to by Mr. Storrow as incompetent, on the ground that it is an attempt to substitute a party's statement of a disputed fact for proof of the fact itself.*]

A. Well, he said he hadn't the means to go on with this machineries except some person or some parties would go in with him.

Q. 101. When did he say that?

A. Well, that I couldn't set no time. He said that frequently.

Q. 102. How long ago did he say it?

A. Well, really I couldn't set no time; but he has, when he was working at these telephones—speaking machines, though, he called it.

Q. 103. What I want to know is whether such remarks were made by him during the time about which you have been testifying—that is to say, from 1869, when you first saw the talking-machines, till you saw the machine marked "A" about the time when the axle company went into operation—was it during that four or five years of time or was it more recently that he made the remark about want of means and about getting others to go in with him?

A. It was between that time. I can't specify the particular time; it was during that time.

Q. 104. What do you know about Mr. Daniel Drawbaugh's pecuniary circumstances from 1869 to the summer of 1880?

A. Well, I know a good bit about them with regard to collecting taxes. I collect State and county tax, or taxes, and school tax, any—well, ever since that time from 1869 to 1880, in Lower Allen township, where I reside now. I have collected some executions off of him, too, and other bills as I had a great deal of trouble to collect them, as he said that he hadn't the means to pay them, and to keep me in good spirits he used to show me those instruments. I rather thought it was done for me to give him still more grace on them for to collect the taxes and bills.

Q. 105. Explain how you used to get his taxes out of him during that time?

A. Well, he would give me bills to collect, and I would collect them—those could be collected—and I would take the best part of that money to pay off other bills and taxes.

Q. 106. What were those bills for, which he gave you to collect?

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A. Well, there were bills for some machineries, pumps, or something of the kind, that he had done for parties. I know of several bills,--this was labor I suppose as he put out. Well, jobs as he put out--sold machines for those bills, I suppose.

Q. 107. Was he in the habit of doing little repairing jobs, and other work of that kind for the people of that vicinity?

A. Yes, sir.

Q. 108. What was his general condition as to ready money during that time, when you would call on him to collect tax bills or other bills from him?

A. I never saw no money from him hardly. Once in a while a dollar or two. The rest I could get out of bills and so forth. He always stated as he had no money. Well, I had to wait till he gets some means of getting it, or rather, some way of making money. Then I had several executions that I paid myself and I have waited him till he gave me bills, and I got my money out of him that way.

Q. 109. How large were these executions that were in your hands against him?

A. Well, really, I can't just say how large they were. I have one here now, an execution against Daniel Drawbaugh in favor of James D. Scott, for the total sum of seventeen dollars and fifty-four cents, including costs. The first payment on it was June 26, 1879, ten dollars, and I paid the execution off myself. Afterwards he give me five dollars. I have no date on that, and the balance due to me is two $\frac{54}{100}$ dollars yet.

Q. 110. The executions which you held against him for collection were on judgments of justices of the peace, were they not?

A. Yes, sir.

Q. 111. Do you know whether or not any of these executions were for groceries, clothes, doctor's bills or other necessary supplies for his family?

A. I could not state that. I do not recollect that—what they were for. Bills that I collected I know of some that were for necessaries.

Q. 112. How long have you held the office of constable of your township?

A. Since '66 I have been in regular every year. Two years before that I was in—'63 and '64—'65 I was out.

Q. 113. Is the office filled by election of the people from year to year?

A. It is.

Q. 114. What are your politics?

A. I am a Republican.

Q. 115. Which political party has been in control in your township during that time?

A. Well, the Republicans had a little majority till '69, or say '70, and since then the Democratic party controlled, and they did sometimes before that.

Q. 116. Then during that time, from '70 till the present time, have you held your office by the votes of people opposed to you politically?

A. Yes, sir.

Q. 117. In your testimony yesterday (Ans. 68) referring to the machine marked "B," you spoke of it as being "not fixed at all as it was then." Please explain more fully how it differs now from what it was then. What is there about it that is different?

A. Well, I hardly can explain it. I might say the bottom is torn out, and this thing (indicating the electro-magnet) isn't put together as it was then. It's the tin box,—as near as I can identify, it is the same box,—the same green color.

Q. 118. Was the electro-magnet then of the same size as that now on the instrument, to the best of your recollection?

A. It was, but it wasn't as big as it is now, that is, it is expanded out,—torn up.

Q. 119. Do you refer to the wire being now loose on the spools?

A. Yes, sir.

Q. 120. From the time when the axle company started up, down to the summer of 1880, were you at Daniel Drawbaugh's shop? If so, how frequently?

A. I was there; I couldn't tell you just how often. I was back and forwards probably six or seven times a year, perhaps oftener.

Q. 121. During that time, did you or did you not see other talking-machines at Mr. Drawbaugh's shop?

A. I did not—that is, not at that time. I might have seen it 1875. Since that he hasn't showed me any to my best recollection.

Cross-examination by Mr. Storrow:

Cross-Q. 122, *de bene.* You testified in your direct examination about some remarks that Drawbaugh made you as to want of means. I wish you would tell me all that he said on that subject at any time.

A. Well, I really couldn't say all that he did say. He said a good bit about means—that he hadn't the means.

Cross-Q. 122½, *de bene.* Tell me all that you remember that he said on that subject.

A. Well, he said he hadn't the means to go ahead with those machines; also, he couldn't pay no taxes or anything that way.

Cross-Q. 123. What did he mean by the phrase "go ahead with those machines?"

[*Objected to by Mr. Hill as incompetent, by reason of calling for witness' opinion as to the meaning of Mr. Drawbaugh's language.*]

A. Well, I don't know myself what he meant as regards to go ahead; it meant that he hadn't the means, I suppose.

Cross-Q. 124. Did he make any talk of this kind to you the first time he showed you the glass-tumbler instrument "F" and the green tin instrument "B"?

A. I don't think he did.

Cross-Q. 125. When was the first time you remember his making any talk of this sort with you?

A. Well, I can't hardly state that. Some time between '73 or '74. It might have been before, but that is the best of my recollection.

Cross-Q. 126, *de bene.* Was not the time when he showed you the instrument "A" the first time when he made that kind of a remark to you, which you recollect?

A. Well, it was about that time—yes.

Cross-Q. 127. Look at all the instruments which have been referred to in your deposition, and which are now on the table, and tell me which is the first one of them that you ever saw.

A. Well, I saw the glass tumbler "F," also the green-painted box "B."

Cross-Q. 128. Which was the next one you saw?

A. The one marked "C." That was just as it is now.

Cross-Q. 129. Which is the next one you saw?

A. I saw instrument marked "A."

Cross-Q. 130. And the next?

A. Well, for that part, I saw "I," but can't set no time when I saw it.

Cross-Q. 131. Do you remember whether you saw "I" after "A" or before it?

A. That I can't recollect. I saw those machines different times.

Cross-Q. 132. Did you first see "I" after you saw "C" or before it?

A. I recollect seeing "C" before I saw "I."

Cross-Q. 133. When did you see "C" the first time?

A. Indeed I can't just recollect the exact time.

Cross-Q. 134. Tell me as near as you can recollect.

A. Well, as near as I can recollect, I really can't state more as between '70 and '74 I saw all them machines.

Cross-Q. 135. I suppose you mean to include the year '74 in your last answer; you don't mean that you saw them all before the year '74 began?

A. I mean in '74; that is about the last time I saw them—in '74, or about that time.

Cross-Q. 136. I call your attention to the little loose piece of tin that plays in a notch under the small block of wood in instrument "B." I suppose you remember seeing that little piece of tin there when you first saw the instrument in 1869, don't you?

A. I did not. I don't remember. I didn't look that close or examine, and, aside from that, the machine ain't like it was at that time.

Cross-Q. 137. Did you hold it in your hand when you listened at it, or was it fastened up to the wall?

A. It was standing on a table.

Cross-Q. 138. When you first saw this instrument "B" and the glass tumbler "F," which you have testified was in 1869, who was in the room with you?

A. Daniel Drawbaugh.

Cross-Q. 139. What kind of manufacturing business was going on in this shop at that time?

A. Faucet—the first faucet manufacture.

Cross-Q. 140. Who were the people who formed that first faucet manufacturing company?

A. Daniel Drawbaugh was the inventor, and the company, I really don't know who all was in. If I am not wrong, William R. Gorgas was one, and John F. Hursh and Joseph Hursh and Dr. M. B. Mosser, Henry S. Rupp, John Sheely. That is all of the party I can think of. There might have been others. Dr. M. B. Mosser, I think, was treasurer. He paid the taxes on the machine shop.

Cross-Q. 141. Daniel Drawbaugh was the superintendent of that company, and superintended the manufacture of their faucets at that time, didn't he?

A. That I don't know; I would suppose so. He also told me he had a share in it—just the same as a share.

Cross-Q 142. What kind of business was being carried on at his shop at the time you saw the instrument "C" there?

A. Well, to the best of my recollection it was the faucets at that time. They were in operation.

Cross-Q. 143. You said you saw the tumbler "F" and the green-box instrument "B" for the first time in 1869. When did you next see them?

A. Well, I didn't see them 'till in about July, '80, as near as I can state that.

Cross-Q. 144. Where did you see them in July, '80?

A. Mr. Chellis and Mr. Jacobs they came asked me if I knew anything about any instrument that Daniel Drawbaugh had, for to talk through or speak through, I don't know which of them words; I forget that. I told them I did, before I moved where I reside now. They asked me also whether I would know any of those instruments. I told them if they had the glass tumbler, and the tin box, I call it, I believe I could recognize very well. Then they showed me both those machines.

Cross-Q. 145. Did they show you any other models or machines at that time?

A. Well, yes, they showed me other machines; I think it was that time; they were several times with me.

Cross-Q. 146. On one of those occasions did they show you the machines now on the table, and which you have testified about?

A. Yes, sir, they showed me "A" and "C."

Cross-Q. 147. How often had you seen "C" between the time you first saw it, and this occasion in the summer of '80?

A. Well that—really I couldn't give you any definite answer on that. I saw that standing on the bench several times; I really couldn't recollect how often I did see it; I saw it several times before I saw Chellis and Jacobs and Daniel Drawbaugh taking it around.

Cross-Q. 148. Tell me as near as you can, in what years you saw it?

A. Well as near as I can; I can't come down to the years; it was between '70 and '74.

Cross-Q. 149. You testified that you saw instrument "A" about the time the axle company commenced operations. Did you see it between that time and the time Mr. Chellis and Mr. Jacobs showed it to you last summer?

A. I saw that about the time, or rather a little before the time, that the axle company got into operation; I did not to my recollection see it between that time and the time last summer, when Mr. Chellis and Mr. Jacobs showed it me.

Cross-Q. 150. When did you last see instrument "I" before to-day?

A. I couldn't give no time—not at all, that I saw it.

Cross-Q. 151. Have you seen it within the last five years before to-day?

A. No, sir.

Cross-Q. 152. Was the manufacturing business of the axle company carried on at Mr. Drawbaugh's shop?

A. Yes, sir.

[*Recess for dinner.*]

Cross-Q. 153. When you first saw glass tumbler "F" and green tube instrument "B" did Mr. Drawbaugh talk into the machine, or sing into the machine?

A. I don't know what you might call it. He doodle, doodle, doodle, and afterwards he talked, and asked me whether I heard it or understood it.

Cross-Q. 154. I suppose you understood what he said through the machine, didn't you?

A. I understood when he asked me whether I heard it.

Cross-Q. 155. You mean that when afterward he told you what he had said through the machine and asked you whether you understood it, you told him yes, is that what you mean.

A. Yes, sir.

Cross-Q. 156. How far from the office of the notary, Mr. Ott, in Harrisburg, is Drawbaugh's shop at Eberly's Mill?

A. About four miles.

Cross-Q. 157. When did you last talk with Mr. Drawbaugh about any telephone or talking machine, before the time when he and Mr. Chellis and Mr. Jacobs came to you last summer?

A. It was, to the best of my recollection, between '73 and '75.

Cross-Q. 158. And is it your recollection that you had no talk with him about any telephones or speaking machines between '75 and the summer of '80?

A. Not as I know of.

Cross-Q. 159. Were you in the habit of reading any of the Harrisburg papers between '75 and '80.

A. No, sir.

Cross-Q. 160. Were you in the habit of reading any newspaper between '75 and '80?

A. Yes, sir.

Cross-Q. 161. What papers?

A. Carlisle *Herald* I am getting for the last eighteen years, and the Mechanicsburg paper; I don't recollect the name; I have been getting off and on. I get the *Mirror* from Carlisle, too.

Cross-Q. 162. I suppose that you knew before last summer, that there were such things as speaking or talking telephones in use in the community, didn't you?

A. Yes, sir.

Cross-Q. 163. You have testified that in the summer of 1880, Mr. Drawbaugh, Mr. Chellis, and Mr. Jacobs saw you on several occasions and talked with you about Drawbaugh's talking machine, did you at any time last summer make an affidavit or deposition for them as to what you knew about Drawbaugh's machine?

A. I did.

Cross-Q. 164. Who wrote the affidavit, and where was it written?

A. I really don't know if Mr. Jacobs or 'Squire Bowman wrote the affidavit; I think though, it was Mr. Jacobs, the first time.

Cross-Q. 165. Did you make a second affidavit, at any time, for Mr. Jacobs or Mr. Chellis?

A. Yes, sir.

Cross-Q. 166. When was that second one and who drew it?

A. It was in the fall, some time in 1880; I think Mr. Jacobs wrote that too, although 'Squire Bowman was along at the same time.

Cross Q. 167. Was it in October when you made that second one?

A. I can't recollect that; I don't know just rightly what time; it was in the fall.

Cross-Q. 168. Did they tell you what they wanted the first one for?

A. They did, but I can't recollect what they did say about the first one.

Cross-Q. 169. Did they tell you what they wanted the second one for?

A. Not as I know; not to my recollection; all they said they were going around taking depositions again.

Cross-Q. 170. Didn't they tell you they were going to use them in a suit?

A. . No, sir; not as I know.

Cross-Q. 171. Who was the first person who spoke to you about making an affidavit?

A. Mr. Jacobs.

Cross-Q. 172. Did he afterwards give you any reason why they wanted a second one?

A. No, sir; not as I know.

Cross-Q. 173. When did you see last the first affidavit?

A. I didn't see it at all from the time they took it.

Cross-Q. 174. When did you see last the second affidavit?

A. I haven't saw it since they took it.

Cross-Q. 175. Was the second one exactly like the first?

A. That I don't know.

Cross-Q. 176. Was the second one brought to you all written out, or was it taken down from your lips?

A. It was taken down, to the best of my recollection—written down at the same time that they were there, as I stated it to them.

Cross-Q. 177. Then the second affidavit wasn't a copy of the first, was it?

A. Not as I know of.

Cross-Q. 178. Who did you swear to it before?

A. Henry N. Bowman.

Cross-Q. 179. Whom did you swear to the first one before?

A. Henry N. Bowman; I think that was the man.

Cross-Q. 180. Who have you talked with about this case since you began to testify yesterday afternoon?

A. I can't tell you; we have talked, different ones; it was, that I am a witness, as regards subpœnaing those witnesses for our court at Carlisle.

Cross-Q. 181. Who have you talked to about this telephone case, since you began to testify in it, yesterday afternoon?

A. I haven't talked with any person, more than I said I was a witness in Daniel Drawbaugh's case.

Cross-Q. 182. Who have you talked with about any of Daniel Drawbaugh's instruments, since you began to testify yesterday afternoon?

A. I haven't talked with anyone that I know of.

Cross-Q. 183. I suppose you knew last summer that speaking telephones were in use in Harrisburg, didn't you?

A. I did not.

Cross-Q. 184. When did you first learn that speaking telephones were in use in Harrisburg?

A. I never learned it; didn't know it.

Cross-Q. 185. Did you ever know that speaking telephones were in use anywhere in the world?

A. Yes, sir.

Cross-Q. 186. How did you learn that?

A. Well, they had telephone or speaking machine at Williams' Grove; I think I saw one.

Cross-Q. 187. When did you see that?

A. When the pic nics were there; I couldn't just tell what month rightly.

Cross-Q. 188. What year?

A. 1880.

Cross-Q. 189. Was it before Mr. Chellis and the others came to you last summer, or after?

A. It was after that.

Cross-Q. 190. Was that the first time you ever knew there were such things as speaking telephones?

A. No, sir; it wasn't the first time.

Cross-Q. 191. What was the first time?

A. Daniel Drawbaugh was the first I heard speak about the telephone or speaking machine.

Cross-Q. 192. When did you first hear of the existence of any telephone, other than the instruments which you say you saw at Drawbaugh's?

A. In '80; I heard them talking about another telephone.

Cross-Q. 193. Who did you hear talking?

A. I couldn't recollect.

Cross-Q. 194. When did you hear anybody have that talk?

A. That was last summer, in '80.

Cross-Q. 195. What time in the summer?

A. I don't recollect.

Cross-Q. 196. Was it before or after Mr. Chellis came to you with Mr. Jacobs?

A. I really couldn' recollect that.

Cross-Q. 197. Was it before or after you saw the telephone at Williams' Grove, or was that the first you heard of it during the year 1880?

A. I couldn't say if it was the first or not.

Re-direct examination by Mr. Hill.

Q. 198. When Mr. Drawbaugh spoke to you through the machine, before you moved to the place where you now live, did you hear and understand what he said through the machine, so that you knew what he said, before he afterwards asked you about it, after laying the machines down?

A. Yes, sir.

Q. 199. When, a long time afterwards, namely, about the time the axle company began operations, he talked at the instrument up stairs, and you listened with an instrument at your ear, on the floor below, did you then understand, through the machine, what was said, so that you knew what he said, before he appeared and stated what it was?

A. Yes, sir.

Q. 200. When he sang through the machine to you, and you heard the singing, and he asked you whether you heard it, did he ask you through the machine whether you heard it, or did he ask you without the aid of the machine, whether you heard it?

A. He asked me through the machine.

Q. 201. Did you hear and understand what it was he was asking you through the machine?

A. Yes, sir.

Q. 202. When Mr. Jacobs took your two affidavits, as you have testified, were they read over by you, or to you?

A. They were read to me after that.

Q. 203. At the time you signed them?

A. Yes.

Q. 204. Were they written down in your presence, as you stated the facts to Mr. Jacobs?

A. Yes, sir.

Q. 205. Who read them over to you, Mr. Jacobs or the magistrate who administered the affirmation?

A. The magistrate.

Examination taken, reduced to writing, and affirmed to and subscribed before me as above set forth.

FRED. M. OTT,
Examiner.

April 20, 1881.

ABRAHAM B. SHANK.

JAMES BROOKS, *being produced, affirmed and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and present occupation.

A. My age is sixty-eight years; my residence is Shiremanstown, Cumberland county; I am a millwright by occupation; at present I am working for the Harrisburg Car Company.

Q. 2. Did you at one time work in the grist-mills at Eberly's Mills, Cumberland county, Pennsylvania?

A. I did.

Q. 3. Can you state the time when you commenced work and the time when you finished your work at said grist-mill?

A. I commenced work there on the sixteenth of December, 1873; I finished the work on the thirty-first of March, 1874.

Q. 4. During the time you were working in said grist-mill, as stated, did you visit the shop of Daniel Drawbaugh at Eberly's Mills, and, if so, how often?

A. I visited the shop; I couldn't tell you how often—I didn't keep any account of that—several times.

Q. 5. I now exhibit to you two instruments, one partially of glass and marked "F," the other partially of metal and marked "B," and ask you whether you saw either of those instruments during any of your visits to Mr. Drawbaugh's shop while you were working in the grist-mill, as stated by you?

A. I saw both of them.

Q. 6. Did Mr. Drawbaugh, at the time, explain those instruments to you and tell you what they were for?

A. He did.

Q. 7. What did he say they were for?

A. For talking in and hearing at a distance.

Q. 8. Did he, at that time, tell you what they were operated by ?

A. Operated by electricity, he told me.

Q. 9. Did you see any batteries connected to them?

A. Not that I recollect.

Q. 10. Did you hear any talk or conversation through the machines at that time?

A. I did.

Q. 11. Where were the two machines while this conversation was carried on through them?

A. This one [indicating machine marked "B"] was on the third floor, or floor next the garret of the shop; this one [indicating machine marked "F"] was on the lower floor.

Q. 12. Which floor do you mean by the lower floor?

A. The ground floor.

Q. 13. Am I to understand that there were two floors or stories between the two instruments?

A. There were two floors between the two instruments.

Q. 14. How were the two instruments connected?

A. By two wires, wrapped with something—I don't know what.

Q. 15. Where were you when you heard the conversation carried on through the instruments?

A. I was on the the third floor that this instrument [indicating "B"] was on first, and afterwards I went down below to hear Mr. Drawbaugh speak.

Q. 16. When you were on the third floor at the instrument marked "B," did you hear any words through it?

A. I did.

Q. 17. Who was speaking at the other instrument?

A. A small boy.

Q. 18. Did you understand through the instrument what he said?

A. I did.

Q. 19. Did you understand through the instrument the peculiarity of his voice, so as to distinguish it as a boy's voice, from the voice of a man ?

A. I did.

Q. 21. Can you now remember any of the conversation, or words that were spoken through the instrument?

A. I do not remember any.

HONE COMPANY,-1

Q. 22. From the position where the boy was and where you were, could you have heard anything the boy said, except by the aid of the instrument?

A. You might have heard a very loud scream, but not to have understood anything.

Q. 23. At which end of the instrument did you place your ear when listening?

A. Here, [indicating the end of the tin tube farthest from the electro-magnet, in the instrument marked "B."]

Q. 24. Was there at that time anything on the end of the tin tube next to the coil, and if so, what?

A. There was what I took to be at that time oiled tissue paper—oiled with linseed oil—over the end of the tube, [pointing to the end of the tube next to the coil;] it was white tissue paper.

Q. 25. Were the instruments at that time lined with a white substance, as they appear now to have been?

A. Yes, sir.

Q. 26. Did Mr. Drawbaugh, at that time, tell you what that lining substance was, and what it was there for?

A. He told me the substance was plaster of Paris, and it was there to prevent echo.

Cross-examined by Mr. Smith:

Cross-Q. 27. How far is your present residence from here and from Eberly's Mills?

A. My present residence from here, we call it five miles, and from Eberly's Mill, two and a half.

Cross-Q. 28. Did you reside in the same place when you were at work in Eberly's Mills in 1873 and 1874?

A. I did.

Cross-Q. 29. And have you resided there ever since?

A. I have.

Cross-Q. 30. And you have known Mr. Drawbaugh all the time, I suppose?

A. I have known him from a child.

Cross-Q. 31. You have been, I suppose, to his place a great many times, both before and since you worked at Eberly's Mills, as you stated before?

A. Yes, sir, I have been there frequently.

Cross-Q. 32. You didn't make any memorandum of this particular occasion when you saw these instruments, did you?

A. My answer to that would have to be too lengthy. For a number of years I have worn glasses all the time, and by bad luck I broke the frame about an inch from the glass, and I went down to get him to mend it in some shape; he fixed it for me; I had some trouble to get him at it, because he was working with these instruments at the time; that is the way I remember the circumstance, I was in a hurry to have it done.

Cross-Q. 33. Did you ever talk with him about them afterwards?

A. I did.

Cross-Q. 34. When was that, and what did you say?

A. One time, I am not able to tell you, I couldn't give you any dates, I recollect of asking him how he was getting along with it; he told me that there was something in it, but he says, "I am too hard up to do what I would like to."

Cross-Q. 35. Can't you give some idea when this was?

A. I could not be positive. If my mind serves me right, it was while I was working at the mill; but I am not sure of it.

Cross-Q. 36. When did you next speak to him about it?

A. I can't fix any time.

Cross-Q. 37. Can you remember what he said about it at any other time?

A. I heard him say several times he would like to make something out of it.

Cross-Q. 38. You thought it would be a very important invention, if perfected, did you not—something very wonderful?

A. I hardly know how to answer that. I didn't look at it of as much importance then as I do now.

Cross-Q. 39. When did you next see the instruments themselves?

A. After I left the mill, I did not see them until last fall or winter some time; I couldn't give you the date when I saw them. Mr. Drawbaugh asked me some time last fall to describe the instrument to him before I saw them, and I did so.

Cross-Q. 40. When and where did you see the instrument after that conversation with Mr. Drawbaugh?

A. Some time last winter in the hotel at Shiremanstown.

Cross-Q. 41. And who was present?

A. Mr. Drawbaugh, Mr. Jacobs, and Mr. A. J. Railing.

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Cross-Q. 42. What was done there?

A. These instruments were shown to me, and we talked about them.

Cross-Q. 43. They are not now, of course, in the same condition that they were when you first saw them?

A. No, sir.

Cross-Q. 44. Did you know last winter that speaking telephones had been widely introduced into use in Harrisburg and other places?

A. Personally I did not; but, by reading papers and by rumor, I thought it was so.

Cross-Q. 45. How early did you know of their being used, either by reading or by rumor?

A. That is a question I can't answer.

Cross-Q. 46. Can't you say whether you had heard of them, or read of them, one, two, or three years before last winter?

[*Objected to by Mr. Hill as immaterial and as not in cross-examination on any matter referred to in the direct.*]

A. I can say I heard of them before last winter, but how long I don't know.

Cross-Q. 47. In what papers had you read of them?

[*Same objection.*]

A. I read of them in the Harrisburg *Independent*, Carlisle *Herald*, Carlisle *Volunteer*, Harrisburg *Telegraph*, and different other papers.

Cross-Q. 48. After you saw the instruments the first time, did you speak about them to any one besides Mr. Drawbaugh?

A. I did.

Cross-Q. 49. To whom?

A. It was the topic of conversation in a good many places and I wouldn't be able to name but few whom I spoke to; John B. Drawbaugh, A. B. Shank, Henry M. Rupp, Jacob Rupp, M. P. Dill, A. H. Dill, and others.

Cross-Q. 50. Why didn't you look at the matter as of as much importance then as you do now?

A. Because I didn't know as much about it.

Cross-Q. 51. You knew just as much about the instruments then as you do now, didn't you?

A. I did.

Cross-Q. 52. And what you know now, which you didn't know then, relates to the instruments which have been brought into general use, does it not?

A. It does, but still my knowledge of them is limited.

Re-direct by Mr. Hill:

Q. Q. 53. You knew, then, that Daniel Drawbaugh had an instrument with which, by means of electricity, a person could talk to a distance and his voice be heard and words understood at a distance, did you?

[*Objected to by Mr. Smith as being leading.*]

A. With electricity, or rather about electricity, I would say I know but little, but Mr. Drawbaugh told me they worked by electricity—his instruments—and words could be heard at a distance.

Q. Q. 54. You knew that spoken words could be heard at a distance by means of those instruments which you saw, and through which you heard conversation, as you have testified, did you?

[*Same objection.*]

A. Yes, sir.

Q. Q. 55. But you did not then appreciate as you do now the greatness of the invention and its commercial value—is that the fact?

[*Same objection by Mr. Smith.*]

A. I did not appreciate it then as I do now.

Re-cross by Mr. Smith:

Re-cross-Q. 56. The distance which you refer to in your last answers was the distance from one floor to the second floor above, was it not?

A. Yes, sir.

Re-cross-Q. 57. How did you go from one of those floor to the other?

A. By stairs.

Re-cross-Q. 58. Did the stairs open up on the floors that you spoke of?

A. At the top of each pair of stairs there was a door.

Re-cross-Q. 59. How large is that building?

A. Now you bring me to guess-work if I must answer that question. I have no measurements. We were speaking of that to-day, and I put it down as fifty feet long, and I was told it was forty feet long, and I suppose it is thirty feet wide.

Re-direct by Mr. Hill.

Q. Q. 60. With whom were you speaking about that to-day?

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A. Mr. Drawbaugh.

Q. Q. 61. To the best of your recollection, how far would you say it was from the instrument "B," at which you listened, to the instrument "F," into which the boy talked?

A. It was over fifty feet, I guess; I would think so.

Examination taken, reduced to writing, and affirmed before me this 20th day of April, 1881, and subscribed to.

FRED. M. OTT,
Examiner.

JAMES BROOKS.

April 21, 9:30, *A. M.*

Met pursuant to adjournment.

Present, Mr. Smith, for complainants, and Mr. Hill, and Mr. Jacobs for respondents.

JOHN J. ZACHARIAS, *being produced, affirmed, and examined, saith:*

Q. 1. State your age, residence, and occupation.

A. Age, forty-one; residence, Siddonsburg, York county, Pennsylvania; by occupation a miller.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pennsylvania?

A. I do.

Q. 3. I exhibit to you the two machines marked "B" and "F," and ask you whether you ever saw them before, and if so, when and under what circumstances you saw them?

A. I did see them, and seen them at his shop, and the exact time I couldn't exactly tell, but it was between '70 and '74—rather earlier than '70 than later than '74.

Q. 4. Is there any circumstance connected with your first seeing them which may aid us to fix the time with more certainty?

A. There is.

Q. 5. State what it is.

A. I went there to buy what is called Drawbaugh's patent tram for leveling mill-stones, and at that time there was two sets of mill-stones put into the mill—the year that I seen this. Judge H. G. Mosser was acting as agent, Joseph Stretch as mill-wright.

Q. 6. In what mill were those two sets of stones put that summer?

A. In a mill belonging to Ross' heirs, or Mrs. Ross, at New Cumberland. It was called New Cumberland mills.

Q. 7. Were you at work at the New Cumberland mills at the time?

A. Yes, sir.

Q. 8. As miller?

A. Head miller.

Q. 9. From what time to what time did you work at the New Cumberland mills.

A. From the fall of '68 to the spring of '76.

Q. 10. Were those the only mill-stones that were put in those mills from the fall of '68 to the spring of '76, or not?

A. They were.

Q. 11. Why did you need the tram at that time?

A. To face and level off the new mill-stones.

Q. 12. When you visited Mr. Drawbaugh's shop on that errand, how came you to see the two instruments marked "B" and "F?"

A. He showed me that in company with other inventions that he was working on at that time.

Q. 13. Did he state to you at that time what those two instruments, "B" and "F," were for?

A. He did.

Q. 14. What did he say they were for?

A. He called them his talking machines.

Q. 15. Did he show you their operation?

A. Yes, sir.

Q. 16. Tell us all about it, what you did with them, and how.

A. This machine here [indicating machine marked "B"] was in his office in the shop: this here [marked "F"] was up stairs. "Now," says he, "just wait here, and I'll go up-stairs and talk in the machine," and so he went up stairs, and spoke, and then afterwards came down and took me up, and showed me machine marked "F."

Q. 17. While he was talking in the machine up-stairs, did you listen at the machine in the office?

A. I did.

Q. 18. State whether or not you heard, and understood, through the machine what he was saying up-stairs?

A. I did.

Q. 19. State whether you did or did not, through the machine, hear the peculiar tones of his voice, so as to distinguish it as Mr. Drawbaughs's voice?

A. I understood his voice distinctly and recognized it.

Q. 20. How did it sound, as compared with his voice when speaking in your presence?

A. The same, only not so harsh, I thought.

Q. 21. When he was speaking in the machine up-stairs, and you listening at the machine in the office, could you have heard what he said, except through the machine?

A. No, sir, not in the tone that he spoke.

Q. 22. Do you remember whether the machine at which you listened, and the machine into which he spoke, were connected in any way, and if so, how?

A. They were connected; with what kind of material, I can't say, exactly, but if my memory serves me right, it was material covered something like that there [pointing to the wrapped wire on the electro-magnet of machine marked "B"] is; this here ("B") was on the work-bench in the shop, and then the wires, or cords, or whatever they were, passed out through the partition, and were connected with this machine [indicating machine "F"] up-stairs.

Q. 23. When you listened, in the office, at this machine, marked "B," at which end of the tin box did you place your ear?

A. At this one, [indicating the end farthest from the electro-magnet.]

Q. 24. Do you remember whether or not the other end of the tin-box was covered with anything at the time?

A. It was.

Q. 25. What is your recollection, as to the material with which it was covered?

A. I can't tell exactly, because it was wrapped in the manner that it is there, and, if anything, it was farther from me; I was positive that it was covered, but did not examine what kind of material; the cover was on the end opposite to the end that was towards me.

Q. 26. By "wrapped in the manner it is there," do you refer to the strings or threads, around the end of the box?

A. Yes, sir.

Q. 27. What were those strings or threads for?

A. I had supposed, to hold the end—to fasten the material that it was covered with—the cover.

Q. 28. Did Mr. Drawbaugh, at that time, say anything about what he could do with his invention—to what distance he could talk with it and hear through it; if so, what did he say?

A. He said he could run it out for miles, and parties could talk in at the one end, and be heard at the other end, the same as persons in a room together.

Q. 29. Did he make any comparison between it and telegraphing, and if so, what did he say about it?

A. He said it would eventually take the place of telegraphs.

Q. 30. Did he say anything about getting a patent upon it, and if so, what did he say?

A. He told me that he hadn't the means, but that as soon as ever he got the means, he was going to have it patented.

Q. 31. During the time you refer to, from 1870 'till into 1874, what was his his pecuniary condition, so far as you know?

A. Hard up for money.

Q. 32. What firm was running the New Cumberland mills at that time?

A. A firm styled Zacharias & Co.

Q. 33. Who were the parties composing that firm?

A. Samuel Zacharias, Sr., Samuel Zacharias, Jr., and Eli Graybill.

Q. 34. State whether or not, during that time, Mr. Drawbaugh was indebted to that firm?

A. I suppose he was, for Samuel Zacharias, Jr., gave me orders not to give him anything unless he had the money.

Q. 35. Did you understand at the time that Mr. Daniel Drawbaugh was indebted to the firm?

A. I did.

Q. 36. For what?

A. For coal and flour.

Q. 37. Did you know what Mr. Daniel Drawbaugh's general reputation was in the community where he lived for truthfulness and honesty—the payments of his honest debts, so far as he was able to do so?

A. As a citizen and neighbor, he has always been respected. Among the business men, of course, he was not liked so well, merely on account of his not having the money to pay his debts. He would have paid them if he had had it.

Cross-examined by Mr. Smith:

Cross-Q. 38. How far is New Cumberland mills from Mr. Drawbaugh's place at Eberly's Mills?

A. Not over three miles.

Cross-Q. 39. How long, in all, did you live at New Cumberland mills?

A. From the fall of 1868 to the spring of 1876.

Cross-Q. 40. How long have you known Mr. Drawbaugh?

A. Fifteen or eighteen years.

Cross-Q. 41. How near to him did you live before '68?

A. Mechanicsburg, a distance of about six miles.

Cross-Q. 42. After '76, how near to him did you live?

A. For two years, about two miles from him, and, from that time up to the present, about six miles or more. I have lived at Siddonsburg about a year, and that is more than six miles.

Cross-Q. 43. Were you ever at Mr. Drawbaugh's place on any other occasion than the one which you have spoken about to-day?

A. Yes, sir.

Cross-Q. 44. How often?

A. Once.

Cross-Q. 45. And only once?

A. That is, if I am not mistaken. The reason I remember of that is this, I went there to buy a cider mill.

Cross-Q. 46. A cider mill of Mr. Drawbaugh?

A. Yes, sir.

Cross-Q. 47. Did he manufacture cider mills and these instruments that you call trams?

A. He manufactured the tram—kept them for sale—but the cider mill he had put up for his own use and run it there at his shop, and I bargained for it as second-hand.

Cross-Q. 48. What did you pay him for it?

A. I don't remember the exact price.

Cross-Q. 49. State as nearly as you can what you gave him for it, and at what time you bought it.

A. He wanted fifty dollars for it, and I got it for less. It was in the fall of 1876.

Cross-Q. 50. What other things did he manufacture or sell, or have for sale at the time you bought the tram?

A. He had what was called Drawbaugh's patent faucet there, that then I think belonged to Hauck & Co.

Cross-Q. 51. Were there men at work there manufacturing any articles?

A. No, sir.

Cross-Q. 52. At the time you bought the cider mill, was there any business carried on there?

A. There was the manufacturing of axles, to a small extent, carried on there.

Cross-Q. 53. Are you a relative of either of the members of the firm of Zacharias & Co.?

A. A son of Samuel Zacharias, Sr.

Cross-Q. 54. What other inventions did Drawbaugh show you which he was working on at the time you bought the tram?

A. The electric clock and writing or spelling machine.

Cross-Q. 55. Did he have those machines there—the clock and the writing machine?

A. Yes, sir.

Cross-Q. 56. More than one of each?

A. No, sir.

Cross-Q. 57. What did he say to you about those machines?

A. Well, his electric clock, he said, by running those wires down into the ground, it would run for all time to come, or as long as the machinery would last; the writing machine, he said, in place of those marks on the paper, that all you had to do was just touch the machine, and spell the words, in place of strokes or marks on the paper; he spelled John and several other words; it had a dial like a clock.

Cross-Q. 58. Can you describe the clock?

A. The face—it was only a rude structure—the face and the workings of it—and there was a pendulum, the same as another clock, with wires from the bottom of the pendulum running down into the ground, at least he said they were into the ground.

Cross-Q. 59. Was the clock running when you saw it?

A. Yes, sir.

Cross-Q. 60. Did he explain to you what would make it run forever?

A. Electricity from the ground.

Cross-Q. 61. Did he tell you how long he had had it running?

A. I don't remember whether there was anything mentioned about the time.

Cross-Q. 62. Did you ever see that clock or any others running by electricty after that?

A. Mr. Shapely, in Mechanicsburg, built one and it was running there, or that one I saw.

Cross-Q. 63. When was that?

A. I seen that one 1877.

Cross-Q. 64. In your direct examination you were asked how did it—

the talking machine—sound as compared with his voice when speaking in your presence, and you answered, "the same, only not so harsh, I thought." Do you mean to be understood that it was as loud as his voice when speaking in your presence?

A. I meant I didn't suppose he spoke as loud, and it didn't seem as loud or as harsh; he may have spoke in a lower tone.

Cross-Q. 65. Can you state about how loud it seemed to you, I mean the sound you heard?

A. As though he was speaking in an undertone.

Cross-Q. 66. How far off do you think you could hear a man speaking as loud as the instrument did?

A. That would be hard for me to say; my ear was close to the machine, and he was only showing me that the machine would do the work.

Cross-Q. 67. Do you remember what was said when you were listening to the machine?

A. I don't remember the words.

Cross-Q. 68. Do you remember how long you listened?

A. There was only a few words passed through the machine.

Cross-Q. 69. In your direct examination you were asked whether you could have heard what was said excepting through the machine, and you answered, "No, sir; not in the tone that he spoke." How did you know in what tone he spoke?

A. The reason I gave that answer, I heard no other sound excepting the sound that I heard through the machine.

Cross-Q. 70. When he told you that he could run it out for miles, and parties could talk in at the one end and be heard at the other end the same as persons in the same room together, and when he said that it would eventually take the place of telegraphs, what did you say to him in reply?

A. That would be a hard matter for me to give the exact words that I came over at that time, but I had my doubts about it at the same time that he was telling me.

Cross-Q. 71. If you recollect the substance of what you said to him in answer to either of these statements, won't you give it?

A. I don't for this reason, he was explaining and I was the listener; that machine was too rude a machine to think that there was much in it, or ask many questions.

Cross-Q. 72. Do you remember anything you said to him about the machines at that time; if so, will you tell us what it was?

A. No, sir; I don't remember anything I should have said.

Cross-Q. 73. Did you, after you left there, talk about the machines to other persons?

A. Yes, sir; I have talked about all the machines, the clock, his talking machine, his writing machine, and his gas governor.

Cross-Q. 74. To whom did you talk at any time about these talking machines?

A. I have talked to George Free about it, and to others; I have talked to a man by the name of Springer. That is all I can think of just now there is others, if I could just recall their names.

Cross-Q. 75. When and where did you talk to George Free?

A. I can't remember the exact time and place; it was several years ago.

Cross-Q. 76. Was it soon after you saw the machines?

A. No, sir; it was not just shortly—not the same year—not just afterwards; it was some time afterwards.

Cross-Q. 77. What did you say to him about them?

A. We were talking about his negligence in not finishing up these patent-rights and making something out of them.

Cross-Q. 78. If you can recall what you said yourself to him, will you please do so?

[*Objected to by Mr. Hill, as not competent for any purpose except to test the witness' recollection. And the statements that may be made in answer to the question, are objected to as not being evidence for any other purpose. The same objection is made to the preceding question and answer also.*]

A. No, sir; I can't.

Cross-Q. 79. When did you talk with Mr. Springer about these talking machines and what did you say to him?

[*Same objection by Mr. Hill.*]

A. In talking to Mr. Springer, it was only of a recent date—about eight months ago—we merely talked about the machine as a person would in a common-place way.

Cross-Q. 80. If you remember what you said to him, will you please state what it was?

[*Same objection by Mr. Hill.*]

A. I can't remember the words as we spoke them together.

Cross-Q. 81. Will you give the substance of what you said to him?

A. The substance of the conversation was, principally about his inventive genius, and about the things under contemplation of completion.

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[*Same objection by Mr. Hill.*]

Cross Q. 82. My inquiry is as to what you said to him about these talking machines. Will you please give me the substance of what you said to him about these machines?

[*Same objection by Mr. Hill, and further objection, on the ground that it is out of the line of the direct examination of the witness, and is not proper cross-examination.*]

A. I don't remember.

Cross-Q. 83. What is Mr. Springer's full name; where does he live and what is his business?

[*Same objections.*]

A. Henry Springer,—lives near Andersontown, and is a shoemaker by trade.

Cross-Q. 84. How came you to have a conversation with Mr. Springer, about eight months ago, about these machines?

[*Same objections.*]

A. He was coming along the road there and we met and got to talking about it.

Cross-Q. 85. Had you had, before that time, any talk with any other persons upon these machines? I mean within a few weeks or months before?

[*Same objections.*]

A. Yes, sir; I had.

Cross-Q 86. With whom?

[*Same objections.*]

A. With Mr. Jacobs.

Cross-Q. 87. Mr. Jacobs, the counsel in this case?

A. Yes, sir.

Cross-Q. 88. When and where did that conversation with Mr. Jacobs take place?

A. In front of my house, in Siddonsburg, if my memory serves me right.

Cross-Q. 89. Which one of you commenced the conversation in relation to these machines?

A. Mr. Jacobs.

Cross-Q. 90. Was there anybody else present?

A. Mr. Drawbaugh was present.

Cross-Q. 91. Did they have these machines with them?

A. Yes sir.

Cross-Q. 92. When was it that they came to see you?

A. Shortly before I had the conversation with Mr. Springer.

Cross-Q. 93. Now will you state what each of them said to you and what you said in reply?

A. They asked me whether I knew anything of Drawbaugh's telephone; I told them I didn't, but that he had a talking machine—that he called it a talking machine; and they produced these articles in company with others, and I pointed these out as the original machines.

Cross-Q. 94. If you told them about the time when you first saw the machines, will you state what it was?

A. The same I have testified to.

Cross-Q. 95. Did you tell them that when you first saw the machine you had your doubts about it, and that the machine was too rude a machine to think there was much in it?

A. No, sir.

Cross-Q. 96. Why didn't you tell them that?

A. The question was not asked.

Cross-Q. 97. Did you remember it at that time?

A. Remember what?

Cross-Q. 98 That you at the time you first saw the machine, had your doubts about it, and that the machine was too rude a machine to think there was much in it?

A. Yes, I remembered it.

Cross-Q. 99. Did they ask you to see other people, and talk about the machines to them?

A. They did not.

Cross-Q. 100. Did you at any time after that, make an affidavit or deposition in relation to these machines?

A. Yes sir.

Cross-Q. 101. When did you do that?

A. I can't tell now the exact time; the evidence is here, though.

Cross-Q. 102. State as nearly as you can?

A. It was last fall; the exact time I can't tell, because I made no memorandum of it.

Adjourned for dinner.

Three o'clock, P. M.

Examination of Mr. Zacharias resumed.

Cross-Q. 103. Who was present when that deposition was taken?

A. Mr. Jacobs, Mr. Drawbaugh and 'Squire Eichelberegr.

Cross-Q. 104. Do you remember who wrote the deposition?

A. 'Squire Eichelberger.

Cross-Q. 105. Did Mr. Jacobs or Mr. Drawbaugh ask you questions, which were taken down, or did you tell your story yourself for the magistrate to take down?

A. Mr. Jacobs told me to go ahead and state to the 'Squire what I knew about the machine, and I did so as well as my memory served me.

Cross-Q. 106. Did you understand or know what the object was in taking that deposition, or what use was to be made of it?

A. I knew, of course, that it was to be in testimony, in favor of that machine.

Cross-Q. 107. Did you put into the deposition the fact, that the first time that you saw the machine you had your doubts about it, and that the machine was too rude a machine to think there was much in it?

A. I wasn't asked that question, and the question was merely asked whether I recognized that machine—at what time and place.

Cross-Q. 108. I understood you to say that you were told by Mr. Jacobs to tell what you know about the machines? If that was so, why didn't you state these facts?

[*Objected to by Mr. Hill, on the ground that the question assumes that they were facts, whereas the witness only testified that they were his inferences and opinions at the time, which inferences and opinions were legal evidence neither when the affidavit was taken nor now.*]

A. He asked me, that is true; Mr. Jacobs asked me for what I knew, but not for my opinion.

Cross-Q. 109. You mentioned a gas governor as one of Mr. Drawbaugh's inventions; what sort of a machine was that and where did you see it?

A. There were two concave dishes, with the concave sides facing one another fastened together with India rubber or gutta percha. I saw it in the shop.

Cross-Q. 110. At the time you saw the machines "B" and "F"?

A. Yes, sir.

Cross-Q. 111. Do you know whether that was a patented invention or whether he manufactured and sold the machines?

A. From his conversation, it was neither patented or was he manufacturing any for sale. I understood that he was only working at its completion; might have made a few test machines.

Cross-Q. 112. When did you first learn that the speaking telephone was in practical use here in Harrisburg, or in any other place?

A. I have only heard talk of it within the last year, I believe, worth mentioning.

Cross-Q. 113. Did you, before that time, read accounts of it in the papers?

A. I may have seen accounts; don't remember them.

Cross-Q. 114. What papers have you been in the habit of reading for the last three or four years?

A. The Mechanicsburg *Journal.*

Cross-Q. 115. Is that the only paper you read?

A. That is the only paper that I have been a regular subscriber for until this year. No, sir; that is not the only paper I read. Since the first of January I have been a subscriber to the New York *World.*

Cross-Q. 116. Have you, for the last three or four years, been accustomed to read any other papers, either regularly or occasionally, as they came in your way?

A. Yes.

Re-direct examination by Mr. Hill:

Q. Q. 117. In your cross-examination, while Mr. Smith was examining you as to what took place in Mr. Drawbaugh's shop, at the time when you listened in the office with your ear to the tin tube, and Mr. Drawbaugh talked into the glass instrument on the floor above, you were asked whether you remembered how long you listened, and you replied in cross-answer 68, in these words: "There was only a few words passed through the machine." What did you mean by that answer? Please explain it more fully.

A. There was only a few words spoken, merely to show that the machine would convey the sound from one place to the other.

Q. Q. 118. Did you believe at the time that you heard and understood all the words that Mr. Drawbaugh spoke into the machine for you to hear?

A. Yes, sir; because he only wanted to show me the working of the machine and there was no cause for deception.

Q. Q. 119. In cross-question 50 you were asked what other things Mr. Drawbaugh manufactured, sold, or had for sale at the time when you bought the tram; to which you replied that he had what was known as Drawbaugh's patent faucet, and that you think it then belonged to Hauck & Co. Do you know when Hauck & Co. bought out the faucet business from the Drawbaugh Manufacturing Company?

A. I do not. The Drawbaugh Manufacturing Company was carrying on in '68, and shortly afterwards it was sold out, but the year I can't tell.

Q. Q. 120. If it should be shown to your satisfaction that Hauck & Co. bought out the Drawbaugh Manufacturing Company in the spring of 1873, what would then be your belief as to whether Hauck & Co. were or were not in control of the faucet business at the time when you purchased the tram and saw the talking machines.

A. I did not know at the time whether those faucets belonged to Hauck & Co. or not, but those faucets were laying there and belonged to some one, or were laying in the shop there, and I had no positive recollection of the time when the firms were changed.

Q. Q. 121. Do you remember what price you paid for the tram that you bought?

A. Fifteen or twenty dollars. He gave it to me under price.

Q. Q. 122. Do you remember why he gave it to you under price?

A. His remark was, he had several laying there, and no call for them, and he would finish me one off for that money.

Q. Q. 123. I wish you would refresh your recollection as to making the affidavit for Mr. Jacobs before 'Squire Eichelberger, and then state whether you are sure as to which one of those gentlemen it was that wrote down your affidavit—whether it was 'Squire Eichelberger himself or Mr. Jacobs.

A. I am under the impression that it was 'Squire Eichelberger. He read the affirmation. I saw the paper, but I didn't give attention to who done the writing.

Q. Q. 124. Who read the affidavit over to you after it was written down?

A. Mr. Jacobs called on Mr. Eichelberger, and Mr. Eichelberger declined on account of sight or of inability; Mr. Jacobs read it.

Q. Q. 125. From the circumstance that Mr. Eichelberger declined on account of sight or of inability, it would seem probable that Eichelberger did not write it. How do you reconcile the fact with your belief that he wrote it?

A. From the fact that he was present and there to take my deposition.

Examination taken, reduced to writing, affirmed, and subscribed before me, this 21st day of April, A. D. 1881.
FRED. M. OTT,
Examiner.

JNO. J. ZACHARIAS.

JOSEPH B. STRETCH, *being produced, sworn, and examined, saith, in answer to interrogatories, as follows:*

Q. 1. State your age, residence, and occupation.

A. Age, forty; residence, Mechanicsburg; occupation, mill-wright.

Q. 2. Were you at any time, as mill-wright, in the employment of Zacharias & Co., at the New Cumberland mills, or Ross' mills, at New Cumberland, in Cumberland county, Pennsylvania; if so, from what time to what time?

A. I wasn't in the employ of Zacharias & Co. I was employed by Henry G. Mosser, agent for Ross' estate at that place. The first work I done for Mr. Mosser was from November 21 to December 19, 1868.

Q. 3. The last?

A. The next was from June 18 to July 3, 1869.

Q. 4. What were you employed to do on these two occasions?

A. On the first occasion, I was employed to put new timbers under the herst; on the second occasion, I was employed to put in two new pair of burrs or mill-stones.

Q. 5. Did Mr. John J. Zacharias, who has just testified in this case, have anything to do in connection with putting in those new mill-stones; if so, what?

A. Mr. John Zacharias, being miller, faced off the burrs and dresssed them up ready for use.

Q. 6. Have you any recollection of his procuring a tram to assist him in facing off and dressing up the burrs on that occasion?

A. Yes, sir; he bought one of Mr. Drawbaugh's patent tram-staffs.

Q. 7. State whether or not such circumstance, of new burrs being put in that mill, and Mr. Zacharias buying one of Drawbaugh's patent tram-staffs to aid in dressing them up, ever occurred on any other occasion than at the time of which you are testifying, so far as you know?

A. No, sir.

Q. 8. How do you fix the date of that transaction?

A. Why, I always keep an account of the work I do, for myself and hands, and I have the dates here from the time the work was done.

Q. 9. Was the tram-staff bought within those dates, from June 18 to July 3, 1869?

A. Yes, sir.

Q. 10. Have you the account book here by which you fix those dates?

A. I have.

Q. 11. Will you please hand it to me, open at the place?

A. Yes, sir; here it is. [Witness hands book to Mr. Hill.]

Q. 12. In whose handwriting are these entries?

A. My own.

Q. 13. When were these entries made in this book?

A. They were made at the end of each week, when we quit work; when this work was going on, which is entered in the book.

Q. 14. Is this your book of original entries?

A. Yes, sir.

Q. 15. Has this book been in your possession from that time to the present?

A. Yes, sir.

[*The book having been submitted to the inspection of counsel for complainants, Mr. Hill requests the examiner to enter upon the record at this point an exact copy of all the entries on the page which the witness points out as the page to which he refers.*]

The examiner copies said page, which is as follows:

April 6*th*, 1869,
To work done at Mrs. Ross' Mill:
J. B. Stretch, 1½ days;
A. H. Smith, 1½ do.
May 14, Smith 5 do.
J. B. S. 4¼ do.
Paid, $30.62½

June 18*th*,
To putting in two new pair burrs:
J. B. S., 5½ days;
A. H. Smith, 5½ do.
26, J. B. S., 4½ do.
" A. H. S., 4½ do.
July 3, J. B. S., 5¾ do.
" " A. H. S., 6 do.
31¾ days @ $2.50, $79.37½.
Paid.

Cross-examined by Mr. Smith:

Cross-Q. 16. Did you mean to be understood in your answer to interrogatory seven that no new burrs had been put into that mill since the ones of which you spoke?

A. No new burrs were put into it after that date while Zacharias was running it.

Examination taken, reduced to writing, and sworn to and subscribed by the witness before me, this 21st day of April, 1881.
FRED. M. OTT,
Examiner.

J. B. STRETCH.

SAMUEL C. CRAWFORD, *being produced, affirmed, and examined, saith, in answer to interrogatories, as follows:*

Q. 1. State your age, residence, and occupation.

A. My age is forty-two; residence, Camp Hill, Cumberland county, Pennsylvania, and occupation, a house painter.

Q. 2. Do you know Daniel Drawbaugh, of Eberley's Mills, Cumberland county, Pennsylvania, and if so, how long have you known him?

A. Yes, sir; I know him; I have known him since the fall of 1874.

Q. 3. Where did you see him, and with whom, in the fall of 1874?

A. At his shop, or work-shop, in company with Mr. Wilson Bear.

Q. 4. Did you go to his shop with Mr. Wilson Bear?

A. Yes, sir.

Q. 5. While you and Mr. Bear were at his shop on that occasion, did you see what Mr. Drawbaugh called his talking machine?

A. Yes, sir.

Q. 6. Please examine the instrument marked "A," which I now hand you, and state whether you ever saw it before, and if so, when and where you first saw it?

PHONE COMPANY,-1

A. This is the instrument, to the best of my knowledge, that I saw at Mr. Drawbaugh's at the time referred to, or one like it. The manner in which I remember the time, or circumstance, I should have said, was we were there regarding the axle business, in which business Mr. Wilson Bear and Mr. Kline were engaged in selling at that time, and Mr. Drawbaugh was showing Mr. Bear through his work-shop. I noticed several instruments that had the appearance to me as being telegraph instruments, and I asked Mr. Drawbaugh whether they were such. The first one alluded to was a fire alarm, then noticing this one, I asked him the question whether this was a telegraph sounding instrument; I can't get at the word, but it was something about a telegraph sounding instrument. Mr. Drawbaugh said, "No, sir; it is a talking machine."

Q. 7. Now, about what time of year was that visit?

A. I couldn't fix the date, but it was some time in the fall of 1874.

Q. 8. Was it cold weather; had there been any snow?

A. No, sir.

Q. 9. Was the weather such as to require fires—was there any fire in the shop that day?

A. No, sir.

Q. 10. Were you about entering Mr. Wilson Bear's employment at that time?

A. As near as I can remember, I was.

Q. 11. Had you been out of employment for some time previous to that?

A. Yes, sir.

Q. 12. What had been the cause of your being so out of employment?

A. The amputation of my limb.

Q. 13. Do you remember the fact of Wilson Bear and Mr. Kline associating themselves with M. M. Grove and J. A. Moore under the name of M. M. Grove & Co., commonly called The Axle Company, for the manufacture of axles and sewing machine axles or journals at Mr. Drawbaugh's shop?

A. Yes, sir.

Q. 14. At what time was your leg amputated?

A. The tenth of June, 1874.

Q. 15. State whether your said visit to Mr. Daniel Drawbaugh's shop was or was not between the date when your leg was amputated and the date when the firm of M. M. Grove & Co. was established and commenced business at that shop?

A. It was.

Q. 16. After your visit to said shop with Mr. Bear, as you have testified, were you in Mr. Bear's employment for some time?

A. Yes, sir.

Q. 17. Were you in the employment of M. M. Grove & Co. after they started?

A. I was for a few days, to go to Allentown to see after their axles which they were having manufactured at that place.

Adjourned until 9 A. M. to-morrow.

April 22, 10 A. M.

Examination of Mr. Crawford resumed pursuant to adjournment.

Present, Mr. Smith and Mr. Storrow, for complainants, and Mr. Hill, Mr. Abraham and Mr. Jacobs, for respondents.

Cross-Q. 18. Did you ever see any other talking machine instrument at Daniel Drawbaugh's except "A?"

A. No, sir.

Cross-Q. 19. You have stated in your sixth answer that on the occasion when you saw it, Mr. Daniel Drawbaugh said, "No, sir, it is a talking machine;" please to tell me anything else that was said about talking machines on that occasion?

A. Do you wish me to state whether there was anything said outside of what I have testified? There might have, but I couldn't recollect more than I have said already.

Cross-Q. 20. After he told you that it was a talking machine, I suppose you made some remark about it, or some inquiry, didn't you?

A. Probably I did; I don't remember more than I have testified.

Cross-Q. 21. Did you stay around there after you heard that, or did you go right away?

A. In all probability we left right away, for we had been there on business—Wilson Bear had been there on business; we had attended—I know that—before that we had attended to the business that called us to go there, and know of no other business that was transacted after that on that occasion.

Cross-Q. 22. I suppose then that, after you got through your business, you looked around among some of his contrivances, out of curiosity, did you?

A. Yes, sir.

PHONE COMPANY,-1

Cross-Q. 23. When did you next go to his shop?

A. That I couldn't say; we went there very frequently that fall, but saw nothing more.

Cross-Q. 24. I suppose you have been there since that fall, often, have you not?

A. Yes, sir.

Cross-Q. 25. Please describe to me any other talking machines you ever saw there, since that fall?

A. I saw none others than this one [pointing to instrument "A."]

Cross-Q. 26. When did you see the instrument "A" after that fall?

A. In 1880.

Cross-Q. 27. What time in 1880, and where?

A. The exact month I couldn't name, probably the last of June or the first of July, in Shiremanstown.

Cross-Q. 28. And where in Shiremanstown?

A. On the street.

Cross-Q. 29. Who showed it to you, and who was present?

A. If you will allow me here to go into details, I was painting at Mrs. Smith's house, when Mr. Drawbaugh and Mr. Jacobs and Mr. H. N. Bowman stopped in front of the house, for what purpose I could not state. I went out to the carriage and spoke to Mr. Drawbaugh, and I saw this instrument—talking machine—and remarked: "I think you are in business, judging from the appearance of things." He says, "yes, sir." I do not remember now whether he said he was on the hunt of Mr. Zimmerman. Mr. Jacobs said, "Had you ever saw any of those instruments?" I told him that I had saw this to the best of my recollection. Mr. Jacobs then asked me when I would be at home; I told him I could not say. He asked me whether I would make affidavit as having seen this machine; I told him I would do so; he said they would call and see me.

Cross-Q. 30. Did you afterwards make an affidavit for Mr. Jacobs, about this machine, and, if so, when and where?

A. Yes, sir, I did; I could not tell the date—probably three weeks after that, at Camp Hill.

Cross-Q. 31. Before whom did you swear to it?

A. H. N. Bowman.

Cross-Q. 32. At this office?

A. No, sir.

Cross-Q. 33. At whose house or office was it?

A. At my house.

Cross-Q. 34. Have you, since then, made a second affidavit?

A. No, sir.

Cross-Q. 35. When Mr. Drawbaugh and the others came to you, in Shiremanstown, how many other instruments besides "A" did they show you?

A. They did not show me any others; there was others with them in the carriage, which I recognized since I am here, that they are used, or have been used, as talking machines.

Cross-Q. 36. Did you ever see the inside of "A?"

A. No, sir.

Examination taken, reduced to writing, and affirmed before me, this 22d day of April, 1881, and subscribed to.
FRED. M. OTT,
Examiner.

S. C. CRAWFORD.

DANIEL WESLEY SMITH, *being produced, affirmed, and examined, saith, in answer to interrogatories, as follows:*

Q. 1. State your age, residence and occupation.

A. I am thirty-two years by the fifth of next August; have worked at printing, on a small scale, with a small office of my own, and between times I have followed peddling; I have not had enough of that kind of work to do—printing blanks, bill-heads, and such things—and living in a part of the country where such things were not in much demand, I have had occasion to follow other things besides printing. My present residence is in Lisburn, Cumberland county, Pennsylvania.

Q. 2. State whether you are acquainted with Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pa.?

A. Yes, sir; I got to be intimately acquainted with him while we lived there, but I knew him before, but not intimately.

Q. 3. Where did you reside in the fall of 1874?

A. At Lewisberry, York county, Pa.

Q. 4. State what changes of residence you made that fall and the next spring?

A. We moved from Lewisberry to Milltown, Cumberland county.

Q. 5. What other changes?

EPHONE COMPANY,-1

A. We lived there about two months and then moved to Harrisburg, to a place on Ridge road; I don't remember the number.

Q. 6. What time of year was it when you moved from Lewisberry to Milltown or Eberly's Mills?

A. In the fall, right after corn-husking; I don't remember any date.

Q. 7. Milltown and Eberly's Mills are names for the same place, are they not?

A. Yes, sir.

Q. 8. While you were residing at Milltown, were you at any time in the shop of Mr. Drawbaugh at that place?

A. Yes, sir; very frequently.

Q. 9. Did you, while there on any of those visits at that time, see Mr. Drawbaugh working on a machine or instrument for talking at a distance?

A. Yes, sir; he was working on the parts of an instrument he called a talking machine.

Q. 10. Will you please examine the instrument marked "A," which I now hand you, and state whether you have any knowledge of having seen it or any of its parts—if so, when and where you first saw it or them?

A. The parts he was working at were something like this—its mouth-piece and those screws—and I did not see it together in this shape; it was to be something of this shape, I recollect; I didn't charge my memory.

Q. 11. How soon after you moved to Milltown or Eberly's Mills was it that you saw him working at this talking machine, as you have testified?

A. Within one week Dan came to my place and told me to come down to his shop and see him working at the shop.

Q. 12. Did you go?

A. I had my work there to attend to, and I don't think I went down—probably in a day or two—I couldn't fix no date.

Q. 13. Well, fix the time as near as you can.

A. As I don't know the date when I moved, it would be impossible for me to locate the particular time when I was down to see Dan.

Q. 14. You lived there about two months; was it during the early or latter part of your residence there that you first saw Drawbaugh working at the talking machine?

A. Well, I was down there frequently all the time I lived there. It was during the early part that I first saw the machine.

Q. 15. Did you at that time have any conversation with Mr. Drawbaugh about the talking machine at which he was working?

A. Yes, sir.

Q. 16. State that conversation, as nearly as you can recall it.

A. He told me he was working at an instrument to convey the voice, to supply the place of the telegraph, and I asked him the limits, thinking it was merely something to connect rooms from one to another, but he gave me as an illustration the distance between Harrisburg and Philadelphia—that parties at that distance could communicate as if they were speaking together. I asked him the limits, and he said, if it were perfected, there would be hardly any limits; that is all; we spoke frequently; he passed my house every morning as he went to his shop.

Q. 17. By limits do you mean limits within which persons could speak to each other by means of this instrument—limits of distance?

A. Yes, sir; I understood him to mean, by saying no limits, great distances.

Q. 18. Did he at that time tell you how or on what principle the machine operated?

A. I don't distinctly remember, but was under the impression and am pretty sure that he intimated electricity; I was under that impression all the time. Well, from his having numerous batteries and a heap of what he called insulated wire—by that I was under no other impression than it was by electricity.

Q. 19. Did he say anything at that time about procuring a patent on it?

A. Yes, sir.

Q. 20. What did he say, as nearly as you can remember?

A. As near as I can remember, he said he had not got the the means required to take out a patent.

Q. 21. Did he or not express his intention to take out a patent when he got the means?

A. He said, if he got able, he was going to have it patented. That is what he told me.

Cross-examined by Mr. Storrow:

Cross-Q. 22. After you moved over to Harrisburg, did you ever go to Drawbaugh's shop?

EPHONE COMPANY,-1

A. No, sir; not till we moved back, and that was last summer, that I was there but a few minutes—passed there.

Cross-Q. 23. And so you have never been in his shop between the spring of '75, when you moved to Harrisburg, and the summer of '80—is that what you mean?

A. Yes, sir.

Cross-Q. 24. You are quite sure that you were never in his shop during those five years, are you?

A. Yes, sir; I am positive that I was not in his shop till last summer, in that time.

Cross-Q. 25. How often did he come to where you lived or worked during those five years?

A. Not once that I can remember. We lived eight or nine miles away from his shop at that time.

Cross-Q. 26. Where have you been in the habit of meeting him since the spring of 1875?

A. I met him frequently in town—when I came to town here.

Cross-Q. 27. Do you mean in Harrisburg?

A. Yes, sir.

Cross-Q. 28. Where did you meet him in Harrisburg?

A. I can't locate any spot. I have passed him on the street. I remember distinctly once of meeting him at White Hall hotel, in Harrisburg.

Cross-Q. 29. When was that?

A. I could not remember, as I have no date to go by and didn't charge my memory as to meeting a friend.

Cross-Q. 30. How many times have you seen him since the spring of '75?

A. It would be impossible for me to tell—frequently, though.

Cross-Q. 31. Give me some idea of what you mean by frequently—once a week, or two or three times a year?

A. I mean probably three or four times in a year.

Cross-Q. 32. At these meetings did he and you talk about his talking machine?

A. No, sir; we merely met as friends would meet, salute each other, and talk of some news of the day; something of that amount. There was never anything intimated about the talking machine in any of our meetings.

Cross-Q. 33. When did you next see any of the parts of instrument "A," after the very first time you saw it?

A. I don't remember of seeing that instrument, only 'till last fall, when Dan was by my place, and had an instrument with him, something like this one, but I don't know whether this is the same one.

Cross-Q. 34. Who was with him when he came to your place last fall with that instrument?

A. This gentleman, Mr. Jacobs, was with him; only those two, Mr. Jacobs and Mr. Drawbaugh.

Cross-Q. 35. Did they have any other instruments with them?

A. They had a battery and several other parts; to see whether I would know them.

Cross-Q. 36. Did you make an affidavit for them on that occasion, or soon after?

A. On that occasion.

Cross-Q. 37. Please tell me as near as you can, when it was?

A. We were husking corn; I can't just tell what date; I could tell if I had my book here; I could tell the date precisely, but I haven't that with me.

Cross-Q. 38. Where is your book?

A. It was only a small pass-book and is at my place of residence, at Lisburn. From a paper just shown me by Mr. Hill, I am satisfied that it was the twenty-first day of October, 1880.

Cross-Q. 39. When you saw Mr. Drawbaugh at work on the parts of an instrument, as you have described, while you lived at Eberly's Mills, I suppose you remember what he told you what each part was for, and how he intended to put them together; don't you?

A. No, sir; he didn't describe the particular uses of the several parts.

Cross-Q. 40. Did he show you how they were to be put together?

A. No, sir; I only saw it in parts all the time he was working at it.

Cross-Q. 41. Did he tell you how it was to be used, when put together?

A. I remember of him saying that a piece like this [indicating mouth-piece of instrument "A"] was to be used as a mouth-piece. Something like this, I am not positive whether this was the piece.

Cross-Q. 42. What was he doing to the parts, when you saw him working at them on this occasion?

A. He was turning screws and thumb-heads like this here, [pointing to the milled thumb-screws-heads on the two sides of the instrument marked "A"] on a lathe on the second floor.

Re-direct examination by Mr. Hill.

Q. Q. 43. Do you remember whether it was before or after corn-husking in the fall of 1874, that you saw him turning up those screw-heads?

A. Yes, sir; it was after. We moved right after corn-husking, and it was after we moved, that I saw him, working at work of that kind on the instrument.

Q. Q. 44. Did you move back to Harrisburg before, or after the first day of January, 1875?

A. I can't remember whether it was before the holidays or after; I am not able to say. I rather think it was after.

Q. Q. 45. When you made the affidavit for Mr. Jacobs and Mr. Drawbaugh in the fall of 1880, who administered the oath or affirmation to you?

A. Mr. Jacobs.

Q. Q. 46. I mean who was the justice of the peace who swore you or affirmed you?

A. I was affirmed by Mr. Jacobs to what I had said, then and there.

Q. Q. 47. Do you remember whether or not an elderly gentleman, 'Squire John F. Lee, of New Cumberland, Pa., was with Mr. Jacobs and Mr. Drawbaugh at the time?

A. No, sir; I don't remember more than of Mr. Jacobs, and Mr. Drawbaugh. If there was another gentleman, he was in the conveyance and I didn't notice him.

Q. Q. 48. Where were the parties when the affidavit was made?

A. At the house of Mr. Bentzel, where I was husking corn.

Q. Q. 49. Do you remember whether the affidavit was written in the house or in the carriage?

A. In the carriage.

Q. Q. 50. Were you in the carriage, or standing by it?

A. Standing by it.

Adjourned until two o'clock P. M. for dinner.

AMERICAN BELL TELEPHO

Two O'clock, P. M.

Examination of Mr. Smith resumed, pursuant to adjournment.

Present Mr. Smith and Mr. Storrow, for complainants, and Mr. Hill, Mr. Abraham and Mr. Jacobs, for respondents.

Re-Cross-Q. 51. When Mr. Drawbaugh and Mr. Jacobs came and got your affidavit, what instruments, or parts of instruments, did they have beside "A"?

A. A battery of some kind, as I stated before, and a few other pieces that I can't accurately describe.

Re-Cross-Q. 52. Please to describe them as well as you can?

A. There was a large jar that I understood represented the battery and a few other wood pieces. The one like "A."

Re-Cross-Q. 53. Did you see anything, except wood pieces, on that occasion other than what you have described?

A. Not wood pieces; but several coils of wire—small coils of wire—to see whether I would recognize the materials he was working on. I could only recognize them as such coils of wire as I saw him have in the shop, when he was at work.

Re-Cross-Q. 54. Since your last answer was given, a number of instruments have been placed upon the table by respondents' counsel. State whether any of those are the instruments, and if so, point out which ones they are?

A. This here jar "F" is one I recognize. And this one "B" with the wire. I ain't so positive about the other two, but it is very likely he had them along. [The other two are marked "D" and "E" for identification.]

Re-Cross-Q. 55. When you saw Drawbaugh at work on the parts of "A" in 1874, as you have testified, what other work was going on in the shop?

A. There was not any work that I was familiar with; there had been a faucet company, but I don't know whether they were doing anything at that time. If there was anything, it was not very extensive, or I would have known something of it. I remember one time of Mr. Wilson Bear, of Camp Hill, and some other gentleman, whose name I don't know, being there to see Dan on business of some patent axle, but the nature of their business, farther, I know nothing about.

Re-Cross-Q. 56. Was this while you lived at Eberly's Mills, that these gentlemen came there to see him about a patent axle?

A. Yes, sir.

EPHONE COMPANY,-1

Re-Cross-Q. 57. Were Mr. Grove, or Mr. Moore, or both of them, the gentlemen who came with them?

A. I don't remember any other parties, but the two gentlemen who I saw there.

Re-Cross-Q. 58. Was Mr. Jacob Kline the other gentleman?

A. I could not say at all; for I did not know the other gentleman, I was acquainted with Mr. Bear, but not the other. I did not know who he was.

Re-Cross-Q. 59. The first time you saw Mr. Bear and the gentleman there about their axle, was it before or after you saw Drawbaugh at work on the parts of "A," as you have testified?

A. It was while he was working at them, and it was the only time that I saw them there.

Mr. Hill states that, on his way to this room after dinner, the witness met him at the door of this building, and stated that he desired an opportunity to correct his testimony on one point, and for that purpose Mr. Hill will ask one or two questions more.

Re-re-direct by Mr. Hill:

Q. Q. Q. 60. Since testifying here this forenoon, have you refreshed your recollection as to the persons in the carriage, at the time when you made your affidavit last fall?

A. Yes, sir, I distinctly remember that there was an elderly gentleman with the party, consisting of three, that I had forgotten. I was thinking over this, while at dinner, and remembered very distinctly that there was such a gentleman, but I didn't know who the gentleman was.

Q. Q. Q. 61. Did anybody talk to you about the matter after you left the witness stand, until you told me at the door, that you wished to correct your testimony?

A. No, sir, I went to the hotel and registered my name on the register, and was thinking over all that I said here, when it flashed on my mind that there were three gentlemen, in place of two, when I gave my affidavit.

Examination taken, reduced to writing, and affirmed and subscribed before me, this 22d day April, 1881.

FRED. M. OTT,
Examiner.

D. W. SMITH.

CHARLES W. DIVEN, *being produced, sworn, and examined, saith, in answer to interrogatories, as follows:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. My age is forty-nine; residence, Fifteenth street, near Herr street, Harrisburg; am Superintendent of the State Arsenal.

Q. 2. Are you able to inform me when and for what length of time one Michael P. Smyser was employed at the State Arsenal, of which you are superintendent?

A. The records of the Arsenal show him to have been on duty from June 1, '70, until June 30, 1873.

Q. 3. State whether you have obtained these dates from an examination of the Arsenal records this morning?

A. Yes, sir; I have.

Cross-examined by Mr. Storrow:

Cross-Q. 4. In what capacity was he employed?

A. One of the employés—a laborer. He could do the labor or duties to be done there.

Examination taken, reduced to writing, and sworn and subscribed to before me, this 22d day of April, 1881.
FRED. M. OTT,
Examiner.

CHAS. W. DIVEN.

MICHAEL P. SMYSER, *being produced, affirmed, and examined, saith, in answer to interrogatories, as follows:*

Examination by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. Age, fifty; residence, Lisburn, Cumberland county; and occupation an auctioneer.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county?

A. Yes, sir.

Q. 3. How long have you known him?

A. About twenty-five years.

Q. 4. Were you formerly employed at the State Arsenal, at Harrisburg—if so, from what time to what time?

A. Yes, sir; I was, from '70 to '73.

Q. 5. During that time, where did your wife reside?

A. At Lisburn, Cumberland county, where I reside at present.

Q. 6. Where is the State Arsenal at which you were employed?

A. It was then in the Capitol grounds here at Harrisburg.

Q. 7. While you were so employed, did your way to and from your home in Lisburn take you by Eberly's Mills?

A. Yes, sir.

Q. 8. State whether, during that time, when going back and forth between Lisburn and Harrisburg, you occasionally stopped at Daniel Drawbaugh's shop, at Eberly's Mills, to see him?

A. Yes, sir.

Q. 9. Do you recollect anything about stopping to see him once, on one of those occasions, with reference to a magic-lantern?

A. Yes, sir.

Q. 10. When was that?

A. It was 1871 or 1872—it was not later than 1872.

Q. 11. While there, on that occasion, state whether Mr. Drawbaugh did or did not exhibit to you what he called his talking machine?

A. He did, sir.

Q. 12. State whether you identify any of the instruments now present, with the machine which he then and there exhibited to you?

A. Yes, sir; it is laying right in front of me. Both of these instruments [indicating instruments "F" and "B."] ["F" and "B" are the only instruments within sight of the witness.]

Q. 13 At what place or places in the shop were those two instruments at that time?

A. This [indicating "F"] was in the cellar, down on the ground floor; there was no flooring there; the ground formed the floor. This [indicating "B"] instrument was on the upper floor; there were two flights of stairs up to where this instrument was.

Q. 14. Were the two instruments connected in any way?

A. Yes, sir; they were connected by a cord, coil, or whatever you may term it—green cords, two of them.

Q. 15. Do you see anything about the instrument now that resembles those cords?

A. Those [indicating the wrapped wire on the electro-magnet of instrument "B"] do.

Q. 16. Did Mr. Drawbaugh, on that occasion, exhibit to you the operation of the talking machine?

A. He did.

Q. 17. Please explain how he exhibited it; tell us all about the exhibition.

A. We went into the cellar on the ground floor, Mr. Drawbaugh and I; a boy, whom I supposed to be Mr. Drawbaugh's boy—I did not ask him whether it was his boy or not—was there, and Mr. Drawbaugh told the boy that he should sing a piece and we would go up stairs—that is, Mr. Drawbaugh and I, where this box [indicating "B"] was, connected with the other by the green coil or wire, whatever you may term it, and he said I could hear it distinct. I took particular notice when we went up stairs that the doors were shut after us. We went into the room where instrument "B" was—the tin box. The boy sang a piece, "Don't you want to be a Christian while you're young?" I heard it just as distinct as if the boy would have been in the room where I was listening at the box. After the boy had sang the piece, Mr. Drawbaugh told him to whisper. He counted five in a whisper, in this way: "one—two—three—four—five" [whispering.]

Q. 18. When the boy was singing the piece, state whether or not you heard and understood the words which he sang as distinctly as you did the music?

A. I did, sir.

Q. 19. Did Mr. Drawbaugh go out of the room to tell the boy to count?

A. He opened the door and halloed down to the boy to whisper; I took notice that he closed the door. Then the boy counted five in a whisper, as I repeated a while ago.

Q. 20. What door did he open; the stair-way door?

A. The stair-way door where we were.

Q. 21. Did Drawbaugh tell you at the time how the instrument was operated, whether by electricity or otherwise?

A. He did; by electricity—it would carry the sound.

Q. 22. Did he tell you how far it would carry the sound?

A. He did, sir; he said he could make a talking machine that could talk from here to California.

Q. 23. Was that visit, to your best recollection, the year before you quit working at the arsenal?

A. Yes, sir.

Q. 24. What was your reason, at that time, for looking into the magic lantern business?

A. My reason was that I was a poor man—and am yet—and in changing of Governers I would have to look out for something, if I was not retained by the incoming Governor, to make a living.

Q. 25. Your arm had been taken off at the shoulder at the battle of the Wilderness, had it not?

A. Yes, sir.

Q. 26. Since leaving the arsenal, have you occasionally visited Mr. Drawbaugh's shop?

A. I have.

Q. 27. Have you, at different times, seen other talking machines at his shop?

A. Yes, sir.

Q. 28. Please look at the twelve other instruments which I now show you, and state whether you recognize any of them as instruments which you saw at Mr. Drawbaugh's shop on other occasions, subsequent to June, 1873?

A. Here is a machine [indicating "A"] that I saw, or one like it, as near as I can tell, and I saw these other ones, [indicating "D" and "E,"] and I saw every other instrument Mr. Drawbaugh had up to six or eight months ago. I have saw this [indicating a machine which is marked "H" for identification;] I saw the instrument marked "I," also "C;" I saw a box like this [indicating box marked "J" for identification.] I saw other machines, but I couldn't particularly identify these others; ["these others," referred to by the witness, are marked "G," "K," "L," "M," "N," for identification.] When I would visit Drawbaugh's shop after the time when I saw machines "B" and "F," I would ask him how he was getting along with his talking machine; he would tell me that he was making improvements, showing me the different improvements.

Q. 29. To the best of your memory and judgment, how many times a year, from June, 1873, to July, 1880, did you visit Mr. Drawbaugh's shop, and see his machines?

A. I visited it some years maybe a dozen of times, or two dozen of times, I couldn't tell positive how many; some years not so many.

Q. 30. What was your observation as to Mr. Drawbaugh's continuing his work on the talking-machines, and making different forms and improvements on the talking-machines, from the time when you first saw them down to July, 1880. Did he seem to be always thinking about them and working upon them, so far as you had opportunity to know, or not?

A. His conversation he and I had was about the machines, because I would ask him how he was getting along with the talking-machine, and then he showed me the improvements on it.

Q. 31. During all that time, did he or did he not frequently show you talking-machines which you had not seen before?

A. He did.

Q. 32. What did he say about them, when he would show you machines which you had not seen before?

A. He said he was making improvements on them.

Q. 33. Did Mr. Drawbaugh ever say anything to you about procuring a patent on his talking-machines?

A. He did.

Q. 34. What did he say about it?

A. He told me that he would procure a patent, but he was making improvements on it. He was going to procure a patent.

Q. 35. In connection with those remarks about procuring a patent, did he say anything about his pecuniary means, and if so, what?

A. Yes, sir, and I knew it without him telling me. He told me that he was poor.

Q. 36. Did he say anything about his poverty interfering with his work upon the machines?

A. He did.

Q. 37. What did he say about that?

A. That he couldn't work at the machine all the time, because he had to do something else to sustain his family.

Q. 38. Do you know his family?

A. I knew his wife and children, yes, sir.

Q. 39. How large a family had he to support?

A. I can't tell the number of his children exactly—how many he has.

Q. 40. Do you recollect anything about sickness in his family during that time?

A. Now, that I can't answer you positive—to the best of my knowledge, he had sickness in his family. That is, I heard so.

Q. 41. Do you know what Mr. Drawbaugh's general reputation was, in the neighborhood where he lived, and is, for honesty, and truthfulness, and as a citizen of that community?

A. I never heard his word doubted or his character either. He is a poor man.

Cross-examined by Mr. Storrow.

Cross Q. 42. Were you at Mr. Drawbaugh's shop in the first half of 1880; and if you were, what work was then doing on telephones?

A. I was there, and I seen that there was improvements, as I stated before.

Cross-Q. 43. Which instruments did you see him at work on in the first half of 1880?

A. I can't tell you that—I can't give you the right answer.

Cross-Q. 44. What improvements did you see in the first half of 1880?

A. I seen the machines were gotten up in better style.

Cross-Q. 45. Did you see many telephones there in 1880, besides these that have been shown you during your deposition?

A. Well, I couldn't say how many. He would show me the improvements, still, that he had made.

Cross-Q. 46. Did you, during the first half of 1880, at Drawbaugh's shop, see any telephone instruments, other than these that are now on the table?

A. Well, I couldn't say positively whether I did, unless I would see the machines, but I rather think I did.

Cross-Q. 47. Didn't you see quite a number of others during that time?

A. When he would show me an improvement, why he would just show me that, and the other ones he wouldn't show me because I could see that there was an improvement. That is after I saw the other ones, still they were the later improvements. I had seen the other ones before.

Cross-Q. 48. I suppose you mean by that, that when you went there, he showed you the latest, and most improved one and didn't take the trouble to show you the old ones over again; do you?

A. If you mean the old ones that I had seen, yes, sir.

Cross-Q. 49. Did you talk through any of his machines, or hear any-one talk through them, in the first half of 1880?

A. I did not.

Cross-Q. 50. Which of these machines did he show you as his newest and most improved machine, in the first half of 1880?

A. This machine [indicating "J"] I saw in or about that time; I can't be definite.

Cross-Q. 51. I suppose you mean that you first saw it about that time, do you?

A. I can't say that it was the first half of 1880. I recollect seeing a box similar to this; I took notice to the nice curled walnut—the cover of it—the lid of it.

Cross-Q. 52. State as near as you can when you first saw the box "J," or one like it.

A. I couldn't say whether it was in 1880 or 1879; in or thereabouts.

Cross-Q. 53. State what other of the instruments on the table he showed you for the first time in 1879, as his newest and most improved instruments?

A. I can't answer that question—put it down just in 1879—I can't do it.

Cross-Q. 54. Can you tell me which of these instruments on the table he showed you in 1878?

A. No, sir.

Cross-Q. 55. Of these instruments on the table, which was the last one he showed you, as his latest and most improved?

A. The last one I don't think is on the table.

Cross-Q. 56. Of these which are on the table, which did he show you the latest?

A. I can't answer whether it was this [indicating "J"] or this other one, [indicating "H"]—saw them both together at one time.

Cross-Q. 57. When was it that you saw them both together?

A. I can't remember.

Cross-Q. 58. Had you ever seen "H" before that time when you saw "H" and "J" both together?

A. I can't recollect that.

Cross-Q. 58½. When you saw these two together, did he say anything to you about getting a patent on either of them?

A. He did not, but I took it for granted that he was going to get it patented, because he had told me on former visits that he was going to get it patented.

Cross-Q. 59. Did he say anything to you about geting it patented at any time since January, 1878?

A. He did tell me before January, 1878, and he told me since, that he was going to get it patented.

Cross-Q. 60. Has he told you that more than once since January, 1878?

A. I think we have talked about it since, but I won't be positive; I couldn't tell how often we talked, because Mr. Drawbaugh and I were very intimate, and I was always anxious to know how he was getting along.

Cross-Q. 61. Why didn't he get it patented in 1878 or 1879?

A. He didn't tell me why, but I supposed because he hadn't the money to do it—was poor.

Cross-Q. 62. Point out, among the instruments on the table, which are the ones you did not see until after January, 1878.

A. I don't know that I saw this machine in front of me marked "J," and this one [indicating "H"]; I won't be positive.

Adjourned until 9 o'clock, A. M., to-morrow morning.

April 23, 9 *o'clock, A. M.*

Examination resumed.

Present Mr. Storrow and Mr. Smith, for complainants, and Mr. Hill, Mr. Abraham, and Mr. Jacobs for respondents.

Cross-examined by Mr. Storrow:

Cross-Q. 63. I understand you to say that, from the time you first saw a talking machine at Drawbaugh's down to last summer, he was too poor to apply for a patent; am I correct or not?

A. I did not say down to last summer.

Cross-Q. 64. Please explain what you did mean in that respect.

A. I meant that he was too poor; I did not specify any time whatever.

Cross-Q. 65. Was he too poor in 1872?

A. I thought he was too poor, just because I didn't know what it cost to procure a patent; I never had any experience in the patent-right business—that is, procuring patent-rights—what it cost.

Cross-Q. 66. Up to what time did you think he continued too poor to take out a patent?

A. I can't answer that question.

Cross-Q. 67. Then you don't mean to say that he was too poor to take out a patent in 1876?

A. I haven't. I might answer that question this way: I didn't know what it cost to take out a patent; no experience, and I thought he was too poor, maybe. No conversation with Mr. Drawbaugh in regard to a patent in 1876. That is the best of my knowledge.

Cross-Q. 68. Are you prepared to say that in 1876 he was too poor to take out a patent?

A. No, sir; I can't answer that question.

Cross-Q. 69. Are you prepared to say that in 1877 and 1878 he was too poor to take out a patent?

A. No, sir.

Cross-Q. 70. Are you prepared to say that in 1875 he was too poor to take out a patent?

A. No, sir.

Cross-Q. 71. Did you in 1878 then consider that he was too poor to take out a patent?

A. I didn't give it any thought, because I didn't think it belonged to me.

Cross-Q. 72. Would you make the same answer about 1875, 1876, and 1877?

A. I would—just the same as the other answer. I didn't give it no thought at all—that is, with regard to getting out a patent-right.

Cross-Q. 73. If you had been told that he could get out a patent for thirty-five dollars, would you have thought he was to poor in all those years to do it?

A. I didn't give it, as I stated before, the getting out a patent-right, no thought—not at that time.

Cross-Q. 74. When did you begin to give thought to his getting out a patent-right?

A. When Mr. Drawbaugh showed me this box [indicating "B"] connected by two wires with the glass tumbler ["F"], I said "You ought to get a patent on that."

Cross-Q. 75. When did you next give thought to the subject of getting a patent on the talking machine?

A. I can't answer definitely.

Cross-Q. 76. Did you ever give thought to that subject after the first time you mentioned?

A. I thought he would at some time.

Cross-Q. 77. Did he and you, after that, ever talk about his getting a patent?

A. I do not know; we might have. I couldn't tell that.

Cross-Q. 78. I suppose within the last six or eight months you have talked with him about his getting a patent; haven't you?

A. I don't know as I did.

Cross-Q. 79. You took a good deal of interest in the improvements he was making in his talking machine after 1873, didn't you?

A. I did.

Cross-Q. 80. Please tell me what talk you had with him, after 1873, about patenting his improvements?

A. I asked him how he was getting along with his talking machine, and he said he was making improvements on it.

Cross-Q. 81. My question was, what talk you had with him about getting out a patent on those improvements; please answer that.

A. I will answer that question as I did the other, that I don't know that I had no particular conversation with regard to the getting out the patent.

Cross-Q. 82. Do you recollect having had any—if so, state what it was?

A. The only conversation that I can state was when the first operation or message conveyed on that there [indicating "B" and "F";] when the boy sang—then I said to him, "If this works right, and you get it completed, you ought to get a patent-right—you ought to get it patented."

Cross-Q. 83. On that occasion, when the boy sang and whispered through "F" and "B," as you have described, did you hold "B" in your hand, or did it lie on the bench?

A. That ["B"] was on the table or bench.

Cross-Q. 84. How near to it did you put your ear?

A. I might have put it within two or three inches or within an inch; I don't know exactly the distance.

Cross-Q. 85. Don't you think your ear was a foot from it?

A. No, sir.

Cross-Q. 86. Please to give your best recollection as to how far your ear was from it.

A. Just the same; I will repeat the answer before, that it might have been within an inch.

Cross-Q. 87. Is it your recollection, that your ear was not more than four inches from it?

A. My ear was closer than that, because this thing being a new thing, evidently I would put my ear close to it, to hear the sound, or to hear the boy sing.

Cross-Q. 88. I do not ask you what you now think is evident or probable; I want you to tell me your recollection of what you actually did then, if your memory enables you to answer.

A. I can't tell exactly how far my ear was away from the instrument.

Cross-Q. 89. Please give me your best recollection on that point, if you have any recollection.

A. I shall repeat the answer as I did before; that is the only answer that I can give; I can't specify a certain distance; I can't do it truthfully, and shan't do it, unless I can do it truthfully.

Cross-Q. 90. What part of the instrument "B" did you put your ear nearest to?

A. I put my ear to this side, [indicating the end of the tin tube farthest from the electro-magnet.]

Cross-Q. 91. Were "B" and "F," at that time, in the same condition they are now in? If they were not, point out any differences that you remember.

A. No, sir; they are not in the same condition they were then. There was a parchment covering over the end of the tube of "B" next to the electro-magnet. I don't take notice of any other difference in "B," only the wires were connected. I can't tell whether this machine "F" was in the same condition as now, because I didn't take so much notice of that. I took notice when we went into the cellar, and he told the boy to sing, that the machine in the cellar was a broken tumbler, or something like a broken tumbler. That machine there [indicating "F"] is just like that, to the best of my knowledge; I took notice that the tumbler had a covering—a wooden covering, like that now on it. I took notice that the tumbler was painted inside.

Cross-Q. 92. What part of the tumbler did you take notice was broken?

A. I took notice that the bottom was broken off, or cut off.

Cross-Q. 93. Wasn't that end of the tumbler all covered up, so that you couldn't see whether it was broken off, or not?

A. I will answer that question in this way: I says to Mr. Drawbaugh, "What are you doing with a tumbler?" and he says, "It is a broken tumbler," and then I took notice it was broken; I merely glanced at the tumbler; I didn't take notice of its being all covered over.

Cross-Q. 94. What was there inside the tumbler?

A. I didn't take particular notice of the inside; I seen it was painted inside—was white inside as if it was painted, because I could see by looking at the outside of the tumbler, that it was painted, or whitened in some way; I was anxious—my attention was drawn, or anxious to go up stairs to hear the boy sing, to see whether the sound of his voice could be conveyed, on the wire, from the tumbler to the box there.

Cross-Q. 95. Wasn't there a frame to hold it, or a basin for it to stand in?

A. I can't say just exactly what it was on. I can't answer definitely. Mr. Drawbaugh took the tumbler in his hand. I don't remember whether it was lying down or not; my attention, as I said before, was drawn upstairs. The first I took notice of it, Mr. Drawbaugh took it up, and handed it to the boy.

Cross-Q. 96. I call your attention to the instruments now on the table, marked "A," "D," "E," "H," "J," "I," and "C," and ask you whether they are all of them now in the same condition that they were in when you first saw them at Drawbaugh's shop.

A. That is a question I cannot answer, because there may be some parts of them taken away that I didn't notice. The boxes and appearance resemble those that I saw. I remember one was broken, when I saw them here yesterday; [the instrument "G" is now also shown to the witness.] I don't remember seeing the broken one at Mr. Drawbaugh's. That instrument "G" is the broken one that I saw yesterday. I don't remember whether a bottom cover was on instrument "D" or not. I just took up the machines and looked at them in this way [holding an instrument up and looking at it with the mouthpiece towards him.] I didn't think I was expert enough to pick any flaw in it.

Cross-Q. 97. When you saw them at Drawbaugh's shop, did you look at their insides, so as to examine and know what the works were inside of each of them?

A. Do you mean, did Mr. Drawbaugh or myself take them apart? No.

Cross-Q. 98. Are you quite sure that you never tried to transmit or hear anything transmitted by any of these machines, except the trial of "F" and "B," which you have mentioned?

A. No, sir; only that one.

Cross-Q. 99. Did you see any of the others at Drawbaugh's shop connected up with wires and batteries, ready to be talked through; and if so, when, and which ones?

A. I seen them connected with wire. Battery—I didn't take notice anything about battery, because I would merely just look at the mouthpiece, or to see that they were improved. There was a difference between the box "B" there and those that I saw. I couldn't say just when. I couldn't give accurate time or date. I couldn't say which; I think I saw "A;" I may have seen "E;" I saw several; I couldn't tell just which ones.

Cross-Q. 100. Where was "A" when you saw it connected with another instrument by wires?

A There is a question I can't answer you; I don't know whether it was connected with any other instrument—that I can't tell; it was up in the shop, where he manufactured his electric clock; it was in the third story, I think, when I heard "B;" there were two rooms on the third story, and that afterwards the room I heard "B" in was partitioned off into two rooms, in one of which the electric clock was, and in that room I think I saw "A" on that occasion.

Cross-Q. 101. Didn't you ever hear or see "A" used at Drawbaugh's shop?

A. No, sir; I did not see it used.

Cross-Q. 102. Did not Drawbaugh explain to you how it was to be used?

A. He did, I think; he told me that you put that to your ear, that way, [witness indicates by holding the instrument up with the mouthpiece against his ear.]

Cross-Q. 103. Have you ever seen more than one electric clock at Drawbaugh's?

A. I did.

Cross-Q. 104. About how many?

A. I might have seen a half a dozen; I might have seen more than that; I saw an improvement on them, too, in the cases and in the works.

Cross-Q. 105. When, as near as you remember, did you first see an electric clock there?

A. It might be four or five years ago; it might be longer; it mightn't be that long.

Cross-Q. 106. Who made them and who invented them?

A. Mr. Drawbaugh told me he made them; I never saw him working at them—not at the clock; I saw him working at a case once; he showed me some works of a clock there, which I supposed that he had

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made. He told me that he invented them; and that is the general belief about it—that is my belief.

Cross-Q. 107. Did you ever see any other things that you understood he invented and made?

A. The first thing I seen that he had invented was a stave-cutter; the next was a jointer, to joint staves, and the next was a molasses faucet, to measure molasses accurately while drawing it; the next thing was a pump, to pump water—a force pump. Since that he has made an improvement on his pump; he has quite another pattern. I think, if my memory serves me right, that the first thing he made was a machine to take daguerreotypes. The first that I saw I couldn't enumerate; a lot of little machines that he had there about the shop. He made a little machine to knot rags for carpet, in place of sewing them. Then he showed me, also, one time that I made a visit to his shop, he told me, he says, "I have got a machine that will give notice when the house is on fire." He took a piece of pine, probably six inches long, and something like a piece of plastering lath, and he had a green coil of wire connected with it—the color of that there [indicating electro-magnet of machine "B;] he said, "I put this to the stove, and whenever it gets browned to a certain degree of heat, why, the bell would ring in the other room." I said to myself, "Dan, you're going to be fooled this time;" but he tried it, and when the wood became brown, sure enough, the bell did ring. I thought at first it was one of his wild notions.

Cross-Q. 108. Do you remember any machinery of his for dressing mill-stones?

A. I do; I think he invented it; it is called the Drawbaugh machine, anyhow, or used to be.

Cross-Q. 109. Do you remember an invention of his in making a self-feeding nail machine?

A. Yes, sir; I remember; I have seen it in operation.

Cross-Q. 110. Were any of these things that you have referred to manufactured at his shop for sale?

A. Yes, sir; the faucet was, the stave jointer, stave-cutter, pump, and clock.

Cross-Q. 111. Did he patent any of these things you have mentioned?

A. The stave-jointer and cutter were patented; whether he got it done or not I can't say.

Cross-Q. 112. Were any of them patented as his inventions, and if so, which ones?

A. Yes, sir; all that were patented were patented as his inventions, to the best of my knowledge; the stave-jointer and cutter, and molasses faucet, pump, also, I think—I am not certain; I don't know whether the others were patented or not, I never took notice.

Cross-Q. 113. Why did you go to his shop when you wanted a magic-lantern?

A. The reason why was that Dan had one, and I knew he could tell me all about it; I knew he was acquainted with such things more than anybody else in our neighborhood; that was his general reputation; when we wanted anything particular we went to Dan; I had all confidence in him that he would tell me the truth—that is his general reputation.

[*Recess for dinner.*]

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2 *o'clock, P. M.*

Examination resumed; same counsel present.

Cross-Q. 114. Look at instrument "B," and tell me what is the use of the long strip of tin underneath the block on which the magnet rests?

A. I don't know; as I told you awhile ago, I was no expert; I didn't take notice of that, either.

Cross-Q. 115. Have you made an affidavit at any time about Drawbaugh's talking machine?

A. Yes, sir.

Cross-Q. 116. When and where?

A. At Lisburn, Cumberland county; I couldn't give you the date; this last spring; I don't know whether it was in December, 1880, or January, 1881. By looking at a memorandum furnished by Mr. Hill I can give the date; it was November 19, 1880.

Re-direct examination by Mr. Hill:

Q. Q. 117. In answer to cross-question 112, with reference to the patenting of Mr. Drawbaugh's stave-jointer, stave-cutter, faucet, &c., and in answer to other questions in the cross-examination relating to the patenting of those inventions, in which answers you stated that some of them were patented, had you any actual knowledge of your own that they were patented, or did you state the fact from hearsay?

A. I have no actual knowledge of my own, but stated it just from hearsay.

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[*Mr. Hill states that he objects to all the evidence brought out on cross-examination, relative to the patenting of other inventions than the talking machine, on the ground that such evidence is secondary.*]

Examination taken, reduced to writing, and sworn to and subscribed by the witness before me, this 23d day of April, 1881.
FRED. M. OTT,
Examiner.

M. P. SMYSER.

URIAS R. NICHOLS, *being produced, affirmed, and examined, saith, in answer to interrogatories, as follows:*

Q. 1. State your age, residence, and occupation.

A. Thirty-nine years; residence, Newberry township, York county, Pennsylvania; farming and brick-making is what I am following at present; my regular occupation is that of a machinist.

Q. 2. When did you commence to reside near Newberry, York county?

A. The 15th of July, 1874.

Q. 3. Prior to that time, what had you been doing?

A. Assistant signal-station and light-house keeper at Miller's Island, near Baltimore.

Q. 4. Were you in Harrisburg, Pa., in the month of January, 1875—if so, for what purpose?

A. I was; for the purpose of seeing Mr. Stevens, member of the Legislature.

Q. 5. Why did you want to see him?

A. Under the new Constitution, he thought a special law could be passed respecting private roads.

Q. 6. Did you go to see him with reference to getting such a law passed?

A. Yes, sir.

Q. 7. At that time—January, 1875?

A. Yes, sir.

Q. 8. How long had the Legislature then been in session when you went to see him?

A. It was in the second week of the session.

Q. 9. How do you fix the time as in the second week of the session?

A. Mr. Stevens mentioned that they had been in session only a few days, and the committees were not all appointed and organized.

Q. 10. Did he say anything from which you fixed the time as in the second, instead of the first, week of the session?

A. He did. He said the first week had been principally occupied in organizing the House and its subordinate officers and that they had adjourned over Sunday.

Q. 11. How long were you in Harrisburg on that trip?

A. I came in the morning, and left about eleven o'clock the same day.

Q. 12. Did you make any purchase while here in Harrisburg on that trip; and if so, what was it?

A. Not in Harrisburg. I purchased, on my way home, lime from Hake.

Q. 13. Are you able to fix the date of that purchase?

A. Not definitely to the day.

Q. 14. Are you able to fix the day when you received the lime so purchased?

A. Yes, sir.

Q. 15. What was the day, and how do you fix the time?

A. It was the eighteenth day of January, 1875. I fix it by the date of an entry of its receipt on my book.

Q. 16. When did you last refer to that book to refresh your memory as to the date?

A. On Wednesday evening last.

Q. 17. On your way home on that trip, did you or not stop at the shop of Daniel Drawbaugh, at Eberly's Mills, Cumberland county?

A. I did.

Q. 18. Did you, then and there, see any of the instruments now on the table before you? If you did, please point out the particular instrument or instruments which you saw.

A. I did see two of the instruments before me—these [indicating "A" and "B."]

Q. 19. Did Mr. Drawbaugh then and there tell you what those instruments were for?

A. He did.

Q. 20. What did he say they were for?

A. A talking-machine.

HONE COMPANY,-1

Q. 21. Did he explain to you the principle upon which they were operated?

A. He did.

Q. 22. What was his explanation, so far as you remember it?

A. That the sound was conducted by electricity, and the waves of sound imparted to a thin substance in the machine, as the parchment with which this end [indicating the end of the tin box next to the electro-magnet of machine "B"] of the machine was then covered.

Q. 23. Do you mean for us to understand that the sound waves were conveyed by electricity, and imparted to the parchment that was stretched over the end of the tin box next to the electro-magnet, in the machine marked "B?"

A. That is what I understood him to explain.

Q. 24. Did you, at that time, hear any conversation carried on by means of these machines, or either of them?

A. I did by this one [indicating machine marked "A."]

Q. 25. While that conversation was carrying on, was the machine marked "A" connected to anything; if so, how?

A. It was; with two wires, to those posts here, fastened with screws, [indicating the two binding posts of the machine marked "A."]

Q. 26. Were the wires connected with those two binding posts before you went there, or was the connection made in your presence, while you were there?

A. Made in my presence, while there.

Q. 27. By whom?

A. By Mr. Drawbaugh.

Q. 28. When you were listening to the conversation which was carried on through the machine or machines, while there, which of the machines did you use while listening?

A. This machine, [picking up machine marked "A."]

Q. 29. Show us how you used that machine when listening.

A. Holding it to the ear in that shape. [The witness picks up the machine marked "A," and holds it with the mouthpiece against his ear.]

Q. 30. What did Mr. Drawbaugh do when you took that machine up and held it against your ear—I mean, what did he do to start the conversation which you heard?

A. He opened a small box that was setting in a closet or cupboard, and spoke as though he was speaking into the box.

Q. 31. Then what did you hear?

A. I heard the voice of a boy saying: "Is it you, father, speaking?"

Q. 32. Where did you hear the boy's voice;—was it in the instrument at your ear?

A. It was.

Q. 33. Did you, while there, see the boy, or see the instrument into which he was speaking?

A. I did not.

Q. 34. Did Mr Drawbaugh, at that time, tell you how far the boy was away from you, when he was speaking and you listening?

A. In answer to my question as to how far he was away, he said it was two hundred feet, or at least two hundred feet of wire, between me and the person speaking.

Q. 35. Did Mr. Drawbaugh, at that time, tell you how long he had had the instrument marked "A?"

[*Objected to by Mr. Storrow, as incompetent, as secondary*]

A. In answer to my question as to how long he had been using this instrument [indicating instrument "A"] he said he had been working at it or using it about sixty days, and then taking up this instrument [indicating instrument "B"] he said he had had it about three or four years.

Q. 36. Did you see instrument "B" operated while you were there at that time?

A. I did not.

Q. 37. Was instrument "B" in the same room with you, while you were listening at instrument "A?"

A. It was laying on the same table on which the other was; he took it from the same cupboard.

Q. 38. Was it connected with wires?

A. It was not.

Q. 39. Am I to understand you that there were three instruments in the room with you, to wit: the box into which Mr. Drawbaugh spoke to the boy, the instrument "A," by which you heard the boy answer back, and the instrument "B," which was lying on the table or bench?

A. From what I saw, there were the instruments "A" and "B," and whatever was in the box was a third one or thing; I didn't examine it.

Q. 40. What was the appearance of the wires which Mr. Drawbaugh, in your presence, connected to the binding posts of the instrument "A?"

A. They seemed to be ordinary copper wires covered with some green substance.

HONE COMPANY,-1

Q. 41. State whether, while you were there, you saw a battery connected with the wires.

A. He showed me a battery that was sitting under the table or work bench, on a small bench, and told me that it was a battery that conducted the electricity, and that it was connected with the machines.

Cross-examined by Mr. Storrow:

Cross-Q. 42. After that visit to Mr. Drawbaugh's shop, did you tell anybody what you had seen and heard there?

A. I think I told Mr. Croll and Mr. Mash (or Maish.)

Cross-Q. 43. Who are they, and where do they live?

A. Mr. Croll is a neighbor of mine, living near Newberry, and Mr. Mash is an attorney, living in York.

Cross-Q. 44. When did you tell them about it?

A. Some time during the winter, when we were in conversation concerning Mr. Drawbaugh and his burr-dressing machine.

Cross-Q. 45. How did you come to talk with them about his burr-dressing machinery?

A. Mr. Croll is a mill owner, and was with me in Mr. Mash's office; his errand in town, he said, was to purchase some bolting cloth; I asked him, I think, whether he used Drawbaugh's burr-dressing machine.

Cross-Q. 46. How did you come to know of Drawbaugh's burr-dressing machinery?

A. I had seen it in use at Mr. Kunkle's mill, at Lisburn.

Cross-Q. 47. Did you ever talk with any one else about these two instruments, "A" and "B," and what you saw and heard at Drawbaugh's on that occasion?

A. I am not able to say whether I did or not.

Cross-Q. 48. When did you next see either of these instruments, "A" or "B," after that occasion?

A. This winter, when Mr. Drawbaugh brought them up to my place.

Cross-Q. 49. Did you ever see Drawbaugh between the occasion referred to and the time when he came to your place in the winter?

A. But once.

Cross-Q. 50. When was that?

A. Some two years, or near that, ago.

Cross-Q. 51. Did you have any conversation then about his talking machines?

A. We did not.

Cross-Q 52. Where was it you saw him then?

A. At Mr. Hake's, in the upper end of York county, about two and a half miles from Eberly's Mills.

Cross-Q. 53. Had you ever seen Drawbaugh before the occasion when you saw these instruments, and which you say was in January, 1875?

A. Yes, sir.

Cross-Q. 54. When and where?

A. A number of times here in town, and at sales in the upper end of York county, and meetings there.

Cross-Q. 55. How far from Eberly's Mills did you live then?

A. Eight or nine miles.

Cross-Q. 56. Eberly's Mills is quite close to the line of upper York county, isn't it?

A. Yes, sir.

Cross-Q. 57. How came you to go to Drawbaugh's shop on the occasion referred to?

A. With Mr. Millard, who had business at Eberly's Mills, who was going by Hake's and near to my place.

Cross-Q. 58. Who was present and witnessed this use of "A" and "B," which you have described?

A. A gentleman who was working in the shop at some other business; he was a stranger to me.

Cross-Q. 59. Wasn't Millard present?

A. No, sir; Millard was not present. When he was through with his business he called at the shop for me, and we started in a few minutes.

Cross-Q. 60. Then Mr. Millard's business was not at Drawbaugh's shop?

A. No, sir.

Cross-Q. 61. How did you happen to go to Drawbaugh's shop, instead of staying with Mr. Millard?

A. To see the electric clock, of which I had read a description in the papers.

Cross-Q. 62. What papers had you read a description of it in?

A. In one of the Harrisburg papers.

Cross-Q. 63. How long before?

A. Some two or three months, I think.

Cross-Q. 64. Do you remember which paper?

A. I do not.

PHONE COMPANY,-1

Cross-Q. 65. Have you been in the habit of reading the Harrisburg papers—any of them?

A. Most always in coming to town to market I buy a morning paper.

Cross-Q. 66. How often have you been in the habit of coming to Harrisburg to market?

A. In the after part of the summer and fruit season, once and twice a week, and in the winter often not more than once a month.

Cross-Q. 67. What was it that you saw in the paper about the clock?

A. Account of a clock invented by Drawbaugh that was run by electricity, and required no winding.

Cross-Q. 68. Did you see the clocks at Drawbaugh's on that occasion?

A. I saw two clocks, but they were not running.

Cross-Q. 69. Were they in the same room as "A" and "B?"

A. They were.

Cross-Q. 70. What other business was being carried on at Drawbaugh's shop on that occasion?

A. I do not know.

Cross-Q. 71. In your forty-ninth answer, you say that you never saw Drawbaugh but once in the six years after your visit, and in your fifty-fourth answer you say that between the time you moved to Newberry and 1875, which I understand to be about six months, you saw him a number of times. I wish you would explain how it happened that your meeting with him ceased so suddenly, and for so long a time.

A. Not from the time I moved to Newberry, but from 1866 to 1869 I saw him a number of times.

Cross-Q. 72. How long ago did you first know him?

A. I have known Drawbaugh, by sight, since about 1860.

Cross-Q. 73. Then I understand you to say that from 1866 to 1869 you saw him frequently?

A. Yes, sir.

Cross-Q. 74. And how often did you see him between 1869 and 1875?

A. Not at all.

Cross-Q. 75. Have you told us all that he said to you about his talking-machine, on the occasion of your visit to his shop, in January, 1875? If not, please tell me everything else that he said, that you can remember.

A. I think that I asked him whether it would take the place of the telegraph on the signal service from one post to another, and he said he didn't know how it would work on long distances. I think he said he hadn't tried it at any great distance, but if he could get it perfect enough to get others to take hold to help him to introduce it, he thought it would answer to communicate between places of business in cities.

Cross-Q. 76. I suppose you have read in the papers, from time to time, about the use of speaking telephones in Harrisburg and other cities.

A. I saw a description some two or three years ago in the *Scientific American*, of a speaking telephone.

Cross-Q. 77. Don't you think it was four years ago that you saw it in the *Scientific American?*

A. I do not know, but I do not think it was so long as four years ago; I do not recollect of reading *Scientific Americans* four years ago, as I had but little interest in such things at that time.

Cross-Q. 78. When did you begin to read the *Scientific American?*

A. Between two and three years ago.

Cross-Q. 79. Have you read it pretty generally ever since?

A. I have not read it generally; I have read it once or twice a month, if I could get them at the book-store, or from other parties who were subscribers.

Cross-Q. 80. Whose telephone was it, or what kind of a telephone was it, that you saw in the *Scientific American?*

A. I don't recollect whose, but it runs in my mind it was Edison's.

Cross-Q. 81. I suppose, after you saw that article in the *Scientific American*, you have seen in the Harrisburg or other papers, references to the use of the speaking telephone in the community; haven't you?

A. I may have, but I don't recollect; I didn't task my memory with it, until this last fall, when there was an account in our county paper of the establishment of a telephone system in our borough of York.

Re-direct examination by Mr. Hill:

Q. Q. 82. State whether you are, or are not, sure that the paper was published in Harrisburg, in which you saw the description of the electric clock.

A. I am not positive, but I think it was; I can't be positive whether it was a Harrisburg paper or not.

Q. Q. 83. The examiner will now read your 75th cross-answer to you, and then ask you whether you are sure that that contains the exact purport and meaning of his remarks, or whether the meaning may have been modified by other remarks which you do not remember.

[*Objected to by Mr. Storrow, on the ground that it is leading, that it*

HONE COMPANY,-1

assumes that to be a fact which has not been testified to, and asks the witness to give a meaning to alleged remarks which no one has testified, were made, and which witness has testified he does not recollect ever were made.]

A. From what I recollect at present, it conveys the idea that I received from the conversation between me and him, as regards himself being too poor to complete and introduce it; that is what I inferred from it, that he was too poor to test it at great distances, and to complete and introduce it.

Q. Q. 84. How long was the interview between you and Mr. Drawbaugh, at the shop, when he exhibited to you the operation of the machine?

A. I am not able to say how long we conversed about that; I was in the shop about the space of two hours.

Q. Q. 85. Was there, or was there not, on that occasion, a good deal of talk between you and Mr. Drawbaugh about the talking machine, but which you are not able now to remember and to state in your testimony?

[*Objected to by Mr. Storrow, on the ground that it is not competent for the party producing a witness to prove that he is not able to give a substantially correct account of the interview which the party has called him to prove.*]

A. After he laid the instrument back in the case, and closed it up, the conversation between us was concerning the artificial arm which I now wear, and other machinery, of which I cannot now call to mind the particular points.

Examination taken, reduced to writing, and sworn to and subscribed by the witness before me, this 23d day of April, 1881.
FRED. M. OTT,
Examiner.

URIAS R. NICHOLS.

Adjourned until Monday, April 25th, at half-past 9 o'clock, A. M.

April 25, 9.30, A. M.

Examination resumed pursuant to adjournment.

Present, Mr. Smith, for complainants, and Mr. Hill, Mr. Abraham, and Mr. Jacobs, for respondents.

JACOB B. FRY, *being produced, affirmed and examined, saith in answer to interrogatories, as follows:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. My age is twenty years; Shiremanstown, Cumberland county, Pa.; occupation laboring.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pa.?

A. Yes, sir.

Q. 3. How long have you known him?

A. Since 1875.

Q. 4. What is your father's name?

A. Jeremiah Fry.

Q. 5. Have you always made your home in your father's family?

A. Yes, with the exception of a few months, when I was hired away from home.

Q. 6. Did your father formerly live at Eberly's Mills; if so, from what time to what time?

A. From the year 1875 to the year 1880.

Q. 7. What time in the year 1875 did he move to Eberly's Mills?

A. In the last days of March, or not later than the first of April in the year 1875.

Q. 8. Did you become acquainted with Daniel Drawbaugh before or after your father moved to Eberly's Mills?

A. After he moved to Eberly's Mills.

Q. 9. How soon after?

A. In a week or so after we lived there, I became acquainted with him.

Q. 10. Were you in his shop frequently?

A. Yes, sir.

Q. 11. Did you ever see any talking-machines there in his shop?

A. Yes, sir.

Q. 12. How soon after you went there to live, did you first see talking-machines in his shop?

A. Several months afterwards; it must have been the latter part of May or June; I am not able to say, or to give the correct time.

Q. 13. Do you remember what kind of weather it was about that time, whether warm or cold?

A. Warm, I think.

Q. 14. What were you doing at the time when you first saw the talking-machine?

A. When I first saw it I wasn't doing anything; only I was down on a visit to see the shop.

Q. 15. Did you at one time do any work in the shop for Harman Drawbaugh?

A. Yes, sir.

Q. 16. How long did you work for him?

A. That is more than I am able to say, to give the correct time, but it may have been a week or two.

Q. 17. When was it that you worked for Harman Drawbaugh?

A. In the year 1875.

Q. 18. Was it warm or cold weather at that time?

A. Warm, I think.

Q. 19. What makes you think so?

A. Because we came back from the shop with our coats off, still, at noon.

Q. 20. While you were so working for Harman Drawbaugh, did you see any talking-machines in the shop?

A. Yes, sir; I did.

Q. 21. Do you remember what kind of machines they were—how they looked?

A. Yes, sir; they were round, with a curled magnet in them, as I recollect.

Q. 22. How many of them were there of that particular kind, that you remember seeing at that time?

A. Two.

Q. 23. Please examine the two instruments which I now show you, marked "D" and "E," and state whether you ever saw them before, and if so, when first?

A. Those are the two with the curled magnets in them, that I saw when I worked for Harman Drawbaugh, and before that time.

Q. 24. Did you hear any talking carried on through those two instruments, at that time?

A. I heard talking through instruments, but can't say whether those, at that time; I heard talking through those since.

Q. 25. But you saw those two instruments at that time; is that your meaning?

A. Yes, sir.

Q. 26. What other instrument did you see at that time, or before that time? Did you see this instrument, "B," or this, "F," or this, "A?"

A. No, sir; not that I remember of.

Q. 27. Do you remember what the conversation was that you heard carried on through speaking-machines, at the time when you heard conversation in that way?

A. I remember him saying that Harrisburg was situated on the banks of the Susquehanna river; those I heard plain and distinct.

Q. 28. Who said that?

A. Daniel Drawbaugh.

Q. 29. Did you hear anybody else talking through the machine?

A. I heard Mr. Drawbaugh and his son Harry talk through them together.

Q. 30. Did his son Harry talk to you at any time through the machine?

A. Not that I recollect of.

Q. 31. When you heard anybody talking through the machines, could you distinguish their voice from that of any other person or not?

A. Yes, sir; I could voices that I knew.

Q. 32. Do you mean by that that if you were familiar with the person's voice you would recognize it by the sound through the machine?

A. Yes. sir.

Q. 33. When you saw those instruments and heard the talking through them, were they connected in any way? If so, how?

A. With a wire.

Q. 34. What kind of a wire?

A. A small, thin wire; it was not a telegraph wire; it was not as heavy as that at that time.

Q. 35. Do you remember whether the wire was covered with anything or not?

A. I am not able to say whether it was or not.

Q. 36. Are you able to say whether the instruments were connected by one or two wires?

A. There was two wires, I think.

Q. 37. What time did your father move away from Eberly's Mills?

A. In the spring of 1880.

Q. 38. Between the time when you first saw the two instruments

"D" and "E" and the time when your father moved away from Eberly's Mills, did you see other talking-machines about Mr. Drawbaugh's shop?

A. Yes, sir.

Q. 39. During what part of that time—the first part, the last part, or all parts of that time?

A. I am not able to say what part of that time. I think, though, it was the latter part of 1878.

Q. 40. Between 1875 and the latter part of 1878, did you see any talking-machines there?

A. Yes, sir.

Q. 41. At what time or times, as near as you can state?

A. The year 1875, about May or June—along there.

Q. 42. Do you remember seeing any other machines between that time and the latter part of 1878?

A. Yes, sir.

Q. 43. When, as near as you can remember?

A. I can't give any time on that; I can't tell just what time.

Q. 44. Was it at one time or at different times?

A. At different times.

Q. 45. Was it one machine or a number of machines?

A. There was different machines that I saw at that time.

Q. 46. As you went into his shop, from the time when you worked for Harman Drawbaugh down to the year 1878, would you, from time to time, see talking-machines that you had not seen before, or was it always the same old machine?

A. There was new ones from that time up; of course, he didn't always have a new machine from the time I came in until I came in again.

Q. 47. But he did sometimes; is that what you mean?

A. Yes, sir.

Q. 48. Did you ever see this machine there, marked "H"?

A. Yes, sir; in the eastern part of the shop, in the corner; in the closet.

Q. 49. When did you see it there?

A. I am not able to say when I saw it there.

Q. 50. Did you at any time see machines and a line or lines of wires outside the shop?

A. Yes, sir.

Q. 51. When was that, as near as you can remember?

A. It was in the spring of 1879, as near as I can remember.

Q. 52. Do you remember what particular instruments were connected by those lines outside of the shop?

A. Yes, sir; that machine there [marked "H"] was one.

Q. 53. How long was the line of wires outside of the shop, as near as you can judge?

A. Between a hundred and two hundred yards, as near as I can judge.

Q. 54. To your best recollection, about how many machines did you see there between the time when you saw these machines marked "D" and "E" and the time when you first saw this machine marked "H"?

A. It is more than I am able to say, though I saw a number of them during that time; I may have saw them all, but I am not able to say.

Q. 55. Do you think you would be able to recognize any of them if you now saw them again?

A. No, sir; I would not be able to recognize them.

Q. 56. Please look at the machines now shown you, marked "G," "K," "L," "M," "N," and state whether you recognize any of them as having been seen by you.

A. No, sir; I am not able to recognize them.

Q. 57. Referring to the machines which you saw there, between the time when you saw these two machines, marked "D" and "E," and the time when you saw the machine marked "H," can you state whether or not, the machines which you saw there resembled in general appearance these machines marked "G," "K," "L," "M," "N," or any of them?

A. Not that I can—I can't refer to any of them between that time.

Q. 58. What is your best recollection of the appearance of the machines that you saw at that time—I mean the new machines that you saw from time to time, that you had not seen before?

A. I can't make any recollections of them; I didn't pay particular attention to them, no more than just that I saw them.

Q. 59. Do you remember talking through any of the instruments while the axle factory was still running there?

A. Not at that time, that I remember of.

Q. 60. Was the axle factory running when you first saw the instruments "D" and "E"?

A. I saw them whilst the axle factory was going on, lying on the work-bench together and a pile.

Q. 61. Explain what you mean by "together and a pile."

A. There is where I saw that curled magnet; the one was together like this [pointing to "E"] and the other was like this [pointing to "D"]; this part was off [pointing to bottom]; they was all lying together on the bench.

Cross-examined by Mr. Smith:

Cross-Q. 62. You say your occupation is laboring; what kind of labor are you engaged in, and at what kind of labor have you worked since you went to Eberly's Mills in 1875?

A. Well, I wouldn't be able to say just what I worked at; regular day's labor, in the machine-shop a little while, that is all.

Cross-Q. 63. Do you mean day's labor on a farm?

A. Yes, sir.

Cross-Q. 64. What did you do for Harman Drawbaugh when you worked for him?

A. Helped him at the patent axle.

Cross-Q. 65. Have you worked in any other machine-shop? If so, when and where?

A. No, sir; I have not worked in any other.

Cross-Q. 66. How long was the axle business carried on in that shop after you worked there?

A. I am not able to say how long.

Cross-Q. 67. Did you at any time see any other business carried on there while you were in the habit of going there?

A. Not in particular.

Cross-Q. 68. Well, if you saw any kind of work being done there by Mr. Drawbaugh or anybody else, while you were in the habit of going there, will you state what it was?

A. Yes; there was magnetic clocks, by Mr. Drawbaugh—so far as I know, by him.

Cross-Q. 69. Anything else?

A. Not that I recollect of.

Cross-Q. 70. When did you first see the magnetic clocks?

A. I am not able to say when.

Cross-Q. 71. Can you tell me how many of them you saw at any one time, or in all?

A. No, sir; I saw a number of them.

Cross-Q. 72. Did you see a number at one time?

A. Yes, sir.

Cross-Q. 73. About what time was it when you saw a number of them?

A. I am not able to say just when, or what time it was.

Cross-Q. 74. Give the year as nearly as you can, when you saw this number of them.

A. It was either in 1878 or 1879.

Cross-Q. 75. Was it before or after you saw the instrument marked "H?"

A. It was before.

Cross-Q. 76. How long before you saw this number of them was it that you first saw a clock of that kind?

A. I am not able to say how long.

Cross-Q. 77. Should you think it was a year before that?

A. No, sir; I think not.

Cross-Q. 78. Did Mr. Drawbaugh ever explain the clock to you, and tell you how it worked?

A. No more than just by electricity, I think.

Cross-Q. 79. Do you know who else worked on these clocks, making them, besides Mr. Drawbaugh?

A. George W. Drawbaugh worked at them, is all that I know.

Cross-Q. 80. How often do you think you were in Mr. Drawbaugh's shop during the years 1876, 1877, 1878, and 1879?

A. I do not know; I was in sometimes as high as twice a day, sometimes once a week, maybe.

Cross-Q. 81. When you first saw the talking instruments, did Mr. Drawbaugh tell you anything about them? If so, will you please state all that he told you?

A. No, sir; I never inquired.

Cross-Q. 82. At the time when you heard the conversation through them, which you have spoken of, what did he say about them?

A. Nothing that I remember of.

Cross-Q. 83. Do you remember anything else that was said through the instruments except that Harrisburg was situated on the banks of the Susquehanna river?

A. No, sir.

Cross-Q. 84. Was there anything else said?

A. Yes, sir; there was.

Cross-Q. 85. Was there a good deal said?

A. I don't remember just how much was said; there wasn't such a great conversation; only was there a little while.

Cross-Q. 86. How long should you think you were there at that time?

A. Probably fifteen or twenty minutes.

Cross-Q. 87. How came Mr. Drawbaugh to show you the instruments at that time?

A. Him and his son Harry was talking together as I came in the shop.

Cross-Q. 88. Where were the two instruments?

A. The one was in the west end of the corner of the shop, and the other was in the east end of the corner of the shop; the one in the west end in the corner was in the lower or first story of the shop, and the other was in the upper.

Cross-Q. 89. Which one did you listen to when you heard the words you have spoken of?

A. That I am not able to say which instrument; the one in the upper part of the shop.

Cross-Q. 90. Did you have any talk with anybody after that about what you had heard?

A. I may have, but don't remember of any.

Cross-Q. 91. When were you first spoken to about giving your testimony in this case, or about what you had heard or seen at Mr. Drawbaugh's shop?

A. I am not able to say just when.

Cross-Q. 92. State, as nearly as you can, who it was that first spoke to you about it.

A. Do you mean about this here, or in the beginning?

Cross-Q. 93. In the beginning, state who spoke to you, about what you had seen at Drawbaugh's shop, and about testifying.

A. Why, Mr. Jacobs, here, as near as I can understand that, and Mr. Daniel Drawbaugh, was the only two that I knew, that spoke to me.

Cross-Q. 94. State, as nearly as you can, how long ago that was.

A. That was about between two and three months ago, as nearly as I can recollect; I wouldn't be positive about that.

Cross-Q. 95. When you saw the other machines, which you did in the following years, what did Mr. Drawbaugh say to you about them?

A. I don't remember of him saying anything to me about them at that time or afterwards.

Cross-Q. 96. When you saw the machine marked "H," did Mr. Drawbaugh show it to you, or did you happen to see it as you went into the shop?

A. I happened to see that; he didn't show that to me.

Cross-Q. 97. Did you open it and see the inside of it?

A. No, sir; I did not.

Cross-Q. 98. How many times did you see it?

A. I saw it several times in the shop, and once down along the creek, on a stump.

Cross-Q. 99. Do you remember what kind of an instrument was connected with it by wires at any time you saw it?

A. No, sir.

Cross-Q. 100. What was being done with it when it was down on the stump?

A. No more than there was one or two wires attached to it; there was nothing done with it when I saw it; I just passed by.

Cross-Q. 101. You have spoken of having seen, at different times, several instrument between the times when you first saw "D" and "E" and the instrument "H;" where were these instruments at the times you saw them?

A. They were laying on the work-bench in the shop.

Cross-Q. 102. Were they in the same room where the clocks were, or where work was done on the clocks?

A. I don't remember of seeing them while the clock was in there.

Cross-Q. 103. Did you see them before you saw the clocks or afterwards?

A. I wouldn't be able to say; I think it was before, though.

Cross-Q. 104. Can you tell me how long the clocks were there, or how long work was being done on them?

A. No, sir.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 25th day of April, 1881.
FRED. M. OTT,
Examiner.

JACOB B. FRY.

Adjourned until two o'clock, P. M.

HONE COMPANY,-1

April 25th, 2 P. M.

Examination resumed, pursuant to adjournment.

Present, the same counsel.

JONATHAN BALSLEY, *being produced, affirmed, and examined, saith, in answer to interrogatories, as follows:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. My age is sixty-three; residence, Cumberland county, in Shiremanstown. My former occupation was blacksmithing; I have no occupation, hardly, now.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county?

A. Yes, sir; I do.

Q. 3. Were you ever at his shop, at Eberly's Mills?

A. Yes, sir.

Q. 4. Did you ever see any talking-machines at his shop, at Eberly's Mills?

A. I saw what he told me were to be talking-machines.

Q. 5. When did you first see them?

A. It was between the twenty-third of October and the twentieth of November, 1875.

Q. 6. How are you able to fix the fact that it was between the twenty-third of October and the twentieth of November, 1875?

A. The reason that I remember that is this fact I know: I was a blacksmith, carrying on and scarcely went anywhere. My wife died the day before the date of that publication [referring to notice of obituary on back of photograph card]. My wife died on the twenty-second day of October, 1875. Between that date and that I visited my son: I generally went about the first of November to visit my son, and stay with him. On account of the death of my woman, I did not get there as I formerly did, but know that I was there not later than the twentieth of November. That is the reason I know the time when I visited, between that time.

Q. 7. Where did you spend the Christmas holidays that year?

A. Down with my son, in Berks county.

[*Mr. Hill asks the examiner to certify that the witness, in connection with his sixth answer, exhibited a lady's photograph, with a printed slip pasted on the back of it, and the examiner so certifies.*]

Q. 8. Is this photograph, which you have exhibited here, a photograph of your deceased wife?

A. Yes, sir.

Q. 9. Did you paste on the back of it this slip or slips of paper, apparently from a newspaper?

A. Yes, sir; I did.

Q. 10. When?

A. The time during my stay with my son; that same winter.

[*Mr. Hill asks the examiner to certify on the record at this point an exact copy of the printed slip on the back of the photograph and identified by the witness.*] *The examiner certifies that slip reads as follows:*

Harrisburg, Pa., Saturday, October 23, 1875.

Sudden death.—Yesterday Mrs. Jonathan Balsley, residing near Shiremanstown, Cumberland county, dropped dead from heart disease. The deceased was a lady of excellent character, and possessed of many noble qualities. Her loss will be deeply felt, and she will be long mourned and missed by her family and friends.

Q. 11. How came you to go to Mr. Drawbaugh's shop after the death of your wife, and before you went to visit your son?

A. Because I was bereft of a companion, and I was troubled. My friends got me to go round and visit where I had been living so long, in order to get rid of this trouble and find relief. That is the cause I went away—just to seek relief. My friends desired me to do so.

Q. 12. Had you formerly lived for a great while at Eberly's Mills?

A. Yes, sir; I lived there from 1833 to 1851.

Q. 13. Was that the first place you went to to divert your mind from your recent troubles, or did you go somewhere else first?

A. No, sir; I went to Milltown first.

Q. 14. By Milltown you mean Eberly's Mills, do you?

A. I do.

Q. 15. Do you recollect the appearance of the talking-machine that you saw at Mr. Drawbaugh's shop when you went there on that occasion?

A. I do, some of them, distinctly.

Q. 16. Can you mention any peculiarity of the machines, or any of them, at that time, that you remember?

A. Yes, sir; I could. If you give me a piece of paper I could describe what I never saw elsewhere. They were a round piece of wood; back of it an iron came around in curious form; I don't know what it were; I shouldn't have known what to do with it if I had picked it up anywhere else. [The witness illustrates his description of the pieces of iron by moving his finger around in a spiral curve.]

HONE COMPANY,-1

Q. 17. Please look at the instruments "D" and "E," now shown you, and state when and where you first saw them.

A. These irons; I saw such a machine, [holding up instrument "D,"] I wouldn't like to swear that was the one, but I saw such material in the shop.

Q. 18. What do you mean by such material?

A. Well, [pointing to the curled magnet on the back of instrument "D,"] I never saw such a thing as that, till I saw it there in that shop.

Q. 19. Do you remember whether the instrument that you then and there saw in that shop, having the curled iron on the back of it, had also the circular mouth-piece on the opposite side of it?

A. Yes, sir; it had a mouth-piece.

Q. 20. Did Mr. Drawbaugh tell you what it was for—I mean the instrument that you saw?

A. He just told me it was for a talking-machine.

Q. 21. Did he talk through it, to show you how it was to be used?

A. No, sir; he didn't talk through it, but he put it to his mouth, and also to his ear; applied it to his mouth and then to his ear.

Q. 21½. Did he explain to you the principle on which it operated?

A. Yes, sir; he gave me an explanation, but I couldn't say what explanation he gave me; I really couldn't do it.

Q. 22. Because you didn't understand his explanation, or because you don't remember it?

A. No, sir; it was beyond my comprehension. That is just the long and short of it; it was too deep for me.

Q. 23. Did he tell you whether it was operated by electricity or not?

A. That matter was talked over; I think I asked him that question.

Q. 24. What did you ask him, and what did he reply?

A. I asked him how it worked, first of all, when he replied, but I couldn't tell you the answer, at all.

Q. 25. Did he tell you how far he could talk through it from one place to another?

A. I can't remember that he did.

Q. 26. When was it that you first saw that instrument, with the curled iron on the back of it, like the instrument "D"?

A. In 1875, between October the twenty-second, and the fifteenth or twentieth of November, but I can't tell you what day.

Q. 27. Have you been able to fix the date of your wife's death by any other thing except the newspaper slip on the back of your wife's photograph ?

A. Yes, sir; if all of you gentlemen go along with me to St. John's cemetery, you can see it, there on the tomb-stone, and also in the family Bible.

Q. 28. Have you referred to the tomb-stone and the record in the family Bible within a few days, to see whether the newspaper date was correct?

A. I have, and found the newspaper date to be correct.

Q. 29. At the time when you saw that machine with the curled iron on the back of it, did you see one or more than one instrument—talking-machine instrument, I mean?

A. Yes, sir; there was a couple of them.

Q. 30. Did you mean a couple that looked alike, or different?

A. A couple that looked alike in shape.

Q. 31. Do you remember whether you saw this instrument "B" there at that time?

A. I cannot remember that thing as well as I can the others, because, being a little in my line of business, I remembered them. But he showed me a great many things.

Q. 32. Do you mean being in your line of business because they had pieces of iron on them?

A. Yes, sir; the peculiarity of them.

Q. 33. Do you remember anything about this glass instrument "F," at that time?

A. Yes, that I remember distinctly.

Q. 34. Do you remember anything about this instrument "A" at that time?

A. No, sir; I couldn't be nearly so positive about that.

Q. 35. Do you remember whether Mr. Drawbaugh, at that time, said anything about batteries in connection with these machines?

A. I do not remember, there was so much said.

Cross-examined by Mr. Smith:

Cross-Q. 36. What other kind of machinery did you see while at Drawbaugh's shop?

A. I don't think there was anything under consideration except this.

Cross-Q. 37. Did you see any kind of business going on?

A. He told me that he was making improvements to this machine. That is about all that I can remember.

Cross-Q. 38. When did you next see the machines "D" and "E?"

A. I could not tell you the date when I saw them; I could not do it.

Cross-Q. 39. Can't you give me some idea when it was?

A. I might give you my idea, and it might be a very wild one, too.

Cross-Q. 40. Give it as nearly as you can.

A. Well, I can guess at it. It might be that I never saw them till two months or three months ago; I can't tell you. I never saw them till that time, or, maybe, not so long ago.

Cross-Q. 40½. Do you remember anything else that Mr. Drawbaugh told you about them at the time he showed them to you?

A. Indeed, I cannot tell you, from the fact that there was so much said.

Cross-Q. 41. Do you remember whether he told you what he intended to do with them when he had made his improvements?

A. No, sir; he didn't, but I suppose he calculated to make something out of it; he generally did.

Cross-Q. 41½. Did you know about any of his inventions that he had made before that time?

A. Yes, sir.

Cross-Q. 42. And what ones?

A. There was the stave-jointer, stave-cutter, and also the faucets.

Cross-Q. 43. Did you know of his making any other inventions after that time?

A. He had a force-pump, and, I guess, an electric clock was an invention; I—there was quite a number of others, but I left the place and haven't been about there.

Cross-Q. 44. Did you see his force-pump and electric clock?

A. Yes, sir; I did.

Cross-Q. 45. Where did you see them?

A. I saw the one in his own shop, and the force-pump at Mr. Sherbane's own farm.

Cross-Q. 46. You mean, then, that you saw the clock at his own shop?

A. Yes, sir; that is what I mean.

Cross-Q. 47. Do you remember when that was?

A. I don't suppose that it was since last winter a year that I saw the clock.

Cross-Q. 48. Do you mean that you saw it since last winter, or that you saw it before that time?

A. Last winter a year ago, I said.

Cross-Q. 49. Did you see more than one clock?

A. Yes, sir.

Cross-Q. 50. How many of them?

A. I couldn't tell.

Cross-Q. 51. Do you remember whether you saw them more than once?

A. I saw them twice—the clocks.

Cross-Q. 52. When was the first time you saw them?

A. One year last winter.

Cross-Q. 53. Have you seen any other machines of any kind which were made at Mr. Drawbaugh's shop since 1875?

A. No, sir; nothing of the kind.

Cross-Q. 54. Did you visit your son again the next year after your wife died?

A. I generally visit my son twice a year—sometimes three times.

Cross-Q. 55. How far did you live from Mr. Drawbaugh at the time your wife died?

A. It was called two mile and a half.

Cross-Q. 56. I suppose you have seen him frequently since he first showed you those talking-machines?

A. No, sir; not very frequently.

Cross-Q. 57. Occasionally?

A. Well, hardly that.

Cross-Q. 58. How often do you think?

A. I don't suppose I have had a conversation with him six times since I first saw them machines.

Cross-Q. 59. At any of those conversations, did you talk with him about the talking-machine?

A. Never, except once.

Cross-Q. 60. Now, when and where was that?

A. It was at the depot at Shiremanstown; I couldn't be so positive when: some time about January or February this year.

Cross-Q. 61. Who else was present?

A. There were others present, but no one had any conversation on the matter; it was separately—him and I.

Re-direct by Mr. Hill:

Q. Q. 62. When did you know about the stave-jointer, stave-cutter, and faucet; was it before you saw the little machine with the curled iron?

A. Yes, sir.

Q. Q. 63. Do you know whether he invented the force-pump before after you saw that machine with the curled iron?

A. Yes, sir; it was long before these machines.

Examination taken, reduced to
writing, and by the witness affirmed
and subscribed to before me this
25th day of April, 1881.
FRED. M. OTT,
Examiner.

JONATHAN BALSLEY.

Adjourned until 9.30, A. M., to-morrow.

Tuesday Morning, April 26.

Examination resumed, pursuant to adjournment.

CHRISTIAN EBERLY, *being produced, sworn, and examined, saith, in answer to interrogatories, as follows:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. I am sixty-four, going on sixty-five; I live at Shiremanstown, and am a farmer at the present time.

Q. 2. When did you first reside at the place now called Eberly's Mills, Cumberland county, Pennsylvania, and how long did you reside there?

A. In the fall of 1844 I went there, and moved from there in 1867.

Q. 3. Where did you move to in 1867?

A. To New Cumberland.

Q. 4. How long did you then reside at New Cumberland before you moved away from there?

A. Four years, less three months.

Q. 5. When you moved away from New Cumberland, where did you move to?

A. To Shiremanstown, the place where I now live, and have resided there ever since.

Q. 6. Can you give the year and month when you moved from Eberly's Mills to New Cumberland?

A. On the first of April, 1867.

Q. 7. Can you give the year and month when you moved from New Cumberland to Shiremanstown?

A. On the 22d of December, 1870.

Q. 8. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county; and if so, how long have you known him?

A. Since 1844; in 1844 I moved to there.

Q. 9. Before you moved to New Cumberland, did you ever hear Daniel Drawbaugh say anything about talking to a distance by electricity; and if so, what did he say?

A. I did; he said that sound could be conveyed by electricity.

Q. 10. Did he say anything about making a machine to do it?

A. Yes, sir.

Q. 11. State all that he said about it at that time, as near as you can remember.

A. I don't remember of him saying anything more than that. He said almost anything could be made; could start a clock; and then afterwards he spoke, then, more about it, after I was at New Cumberland.

Q. 12. When he was talking about it before you went to New Cumberland, do you remember whether or not he said anything about being then experimenting on conveying sound to a distance by electricity?

A. Yes, sir; he did.

Q. 13. Did you ever see any machines or instruments of his for talking to a distance by electricity?

A. I am not certain whether I seen before I moved to New Cumberland, but I am certain I seen several instruments soon after I moved to New Cumberland; I might have before I moved, but I am not certain.

Q. 14. Are you certain that you saw them while you yet lived at New Cumberland, before you moved to Shiremanstown?

A. Yes, sir; I am.

Q. 15. Please examine the two machines, "B" and "F," which I now show you, and state whether you ever saw them, or either of them, before; if so, state where and when you first saw them.

A. I seen these two first—these are the first I ever saw there—soon after I moved to New Cumberland, at Mr. Drawbaugh's shop, at Eberly's Mills, I saw them; there is another instrument besides this one, but these are the first.

Q. 16. When you first saw these machines, "B" and "F," did Mr. Drawbaugh tell you what they were for? If so, what did he say.

COMPANY,-1

A. To convey sound by electricity.

Q. 17. Did he state what kind of sound they would convey—whether spoken sounds or not?

A. Yes; he said by talking; he mentioned that it would answer the same as telegraphing.

Q. 18. Look at this machine marked "A," and state whether you recognize it as having been seen by you before the present time; and if so, state when you saw it, as near as you can remember.

A. I seen it—I seen this instrument while I lived at New Cumberland, but after I saw these other instruments—these other instruments I seen first.

Q. 19. How long do you think you saw this instrument "A" after you had first seen these instruments "B" and "F?"

A. I don't think it was a great while after.

Q. 20. Before you moved to New Cumberland, had you been interested with Mr. Drawbaugh, or in partnership with him, in any inventions or patents? If so, what?

A. Yes, I was; I was interested with him in a steam-injector, stave-cutter, balance-ryne, and a mill-tram; I believe that is all; also a nail-feeder; I forgot that.

Q. 21. What was the nature of the partnership between you and him with respect to all those inventions? What was Drawbaugh to contribute to the partnership property, and what were you to contribute?

A. I furnished the money for to get those patents on those inventions, and he done the work, and I was equal partner with him.

Q. 22. Then, are we to understand that Mr. Drawbaugh furnished none of the money to get those patents and introduce those inventions, but that you furnished the money therefor?

A. Yes, sir; I furnished all the money, for I don't recollect of him ever having any money; it's true.

Q. 23. When Mr. Drawbaugh showed you his talking-machines, or machines for conveying sound to a distance, state whether or not he proposed to you to go into partnership with him and furnish the money for that also, as you had, before that time, done on the other inventions.

A. Not altogether; he intimated that he would take me in.

Q. 24. Take you how?

A. As partner; as I did before that, still.

Q. 25. Did you decline the proposition or intimation?

A. I don't recollect as I said anything, or what I said.

A. On the first of April, 1867.

Q. 7. Can you give the year and month when you moved from New Cumberland to Shiremanstown?

A. On the 22d of December, 1870.

Q. 8. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county; and if so, how long have you known him?

A. Since 1844; in 1844 I moved to there.

Q. 9. Before you moved to New Cumberland, did you ever hear Daniel Drawbaugh say anything about talking to a distance by electricity; and if so, what did he say?

A. I did; he said that sound could be conveyed by electricity.

Q. 10. Did he say anything about making a machine to do it?

A. Yes, sir.

Q. 11. State all that he said about it at that time, as near as you can remember.

A. I don't remember of him saying anything more than that. He said almost anything could be made; could start a clock; and then afterwards he spoke, then, more about it, after I was at New Cumberland.

Q. 12. When he was talking about it before you went to New Cumberland, do you remember whether or not he said anything about being then experimenting on conveying sound to a distance by electricity?

A. Yes, sir; he did.

Q. 13. Did you ever see any machines or instruments of his for talking to a distance by electricity?

A. I am not certain whether I seen before I moved to New Cumberland, but I am certain I seen several instruments soon after I moved to New Cumberland; I might have before I moved, but I am not certain.

Q. 14. Are you certain that you saw them while you yet lived at New Cumberland, before you moved to Shiremanstown?

A. Yes, sir; I am.

Q. 15. Please examine the two machines, "B" and "F," which I now show you, and state whether you ever saw them, or either of them, before; if so, state where and when you first saw them.

A. I seen these two first—these are the first I ever saw there—soon after I moved to New Cumberland, at Mr. Drawbaugh's shop, at Eberly's Mills, I saw them; there is another instrument besides this one, but these are the first.

Q. 16. When you first saw these machines, "B" and "F," did Mr. Drawbaugh tell you what they were for? If so, what did he say.

COMPANY,-1

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A. I seen it—I seen this instrument while I lived at New Cumberland, but after I saw these other instruments—these other instruments I seen first.

Q. 19. How long do you think you saw this instrument "A" after you had first seen these instruments "B" and "F?"

A. I don't think it was a great while after.

Q. 20. Before you moved to New Cumberland, had you been interested with Mr. Drawbaugh, or in partnership with him, in any inventions or patents? If so, what?

A. Yes, I was; I was interested with him in a steam-injector, stave-cutter, balance-ryne, and a mill-tram; I believe that is all; also a nail-feeder; I forgot that.

Q. 21. What was the nature of the partnership between you and him with respect to all those inventions? What was Drawbaugh to contribute to the partnership property, and what were you to contribute?

A. I furnished the money for to get those patents on those inventions, and he done the work, and I was equal partner with him.

Q. 22. Then, are we to understand that Mr. Drawbaugh furnished none of the money to get those patents and introduce those inventions, but that you furnished the money therefor?

A. Yes, sir; I furnished all the money, for I don't recollect of him ever having any money; it's true.

Q. 23. When Mr. Drawbaugh showed you his talking-machines, or machines for conveying sound to a distance, state whether or not he proposed to you to go into partnership with him and furnish the money for that also, as you had, before that time, done on the other inventions.

A. Not altogether; he intimated that he would take me in.

Q. 24. Take you how?

A. As partner; as I did before that, still.

Q. 25. Did you decline the proposition or intimation?

A. I don't recollect as I said anything, or what I said.

Q. 26. What I want to get at is, whether you accepted the proposition or not.

[*Objected to by Mr. Smith, because it assumes what Mr. Drawbaugh said to be different from what the witness has testified, and because the witness has already testified as to the response which he made to Mr. Drawbaugh.*]

A. I did not, and my reason for not accepting it—taking no part in it—was that the last invention, the nail-feeder, wasn't altogether completed, and he was still experimenting on that.

Q. 27. Can you state the time, or about the time, when Mr. Drawbaugh intimated that he would take you into partnership on the talking-machine?

A. About the last of—during the time I lived at New Cumberland—about the last of that.

Q. 28. You must be well acquainted with the people at Eberly's Mills. Will you tell me how large a place it is—how many families live there?

A. About fifteen or twenty.

Q. 29. Are they rich or poor people who live there?

A. Mostly poor.

Q. 30. Was the place named for you and your mills?

A. Yes, sir; when I moved there the place was called Milltown, and when I got there I got a post-office, and they put me in for postmaster, and called it "Eberly's Mills post-office." That is the way it came to be called. I also owned the property there, pretty much all of it.

Q. 31. Had there been a post-office there before, which had been abandoned, and which you got reëstablished?

A. Yes, sir.

Q. 32. When Drawbaugh showed you the machines for conveying sound to a distance, did he say whether or not he intended to take out a patent on it?

A. I don't recollect hearing him saying anything about it; I think he did.

Q. 33. Do you mean that you think he said something about it, but don't recollect what he said?

A. Yes; that is what I mean.

Q. 34. Were you at his shop between the year 1870 and the present time?

A. Yes; I was there during 1871, 1872, and 1873, frequently, but not very often since that.

Q. 35. When you used to go there frequently during the years 1871—'72—'73, did he say anything to you about the talking-machine?

A. He did; he said that he would have it completed.

Q. 36. Was he working upon it during that time?

A. I can't tell you that; I don't know after studying. He would always show me, and explain to me, but if you mean about working at it, I don't know how to put that in. I suppose he was working at it; he would always tell me about it. I didn't see him working at it.

Q. 37. What has been Drawbaugh's pecuniary condition down to the summer of 1880?

A. I am not able to tell that. I think he has been poor all the time.

Q. 38. Did you formerly know Mr. Lee, who was a brother-in-law of Governor Geary, and was his private secretary?

A. I did.

Q. 39. State anything you know about Mr. Lee's knowledge of, or connection with, this talking-machine invention of Mr. Drawbaugh's.

A. Mr. Lee and I frequently went from New Cumberland up to Mr. Drawbaugh's shop, and Mr. Drawbaugh would explain and show Mr. Lee, still, the workings of this electricity, and on the way home once Mr. Lee told me that he thinks Mr. Drawbaugh would like him to take an interest as a partner in this matter.

Q. 40. Is Mr. Lee living or dead?

A. He is dead.

Q. 41. When did he die, to the best of your recollection?

A. About 1872.

Cross-examined by Mr. Smith:

Cross-Q. 42. How far did you live from Mr. Drawbaugh's shop when you lived at New Cumberland, and how far after you moved to Shiremanstown?

A. About three miles to New Cumberland, and about three miles to Shiremanstown, where I live now.

Cross-Q. 43. Do you know whether Mr. Drawbaugh ever owned any real estate or had any other property of his own?

[*Mr. Hill states that he does not wish to object to this line of cross-examination nor to the question, except so far as it may call for secondary evidence. As Mr. Hill proposes to show hereafter, from the records of Cumberland county, what interest in real estate Mr. Drawbaugh had, and regarding said records as the best evidence, so far as they go, he objects to any oral testimony that may be substituted for them, as secondary.*]

A. I know that he bought a property at Mechanicsburg, but whether he paid for it, I don't know. I think his family lived there one year, and I think he since has sold the property. I don't know of him owning any now.

Cross-Q. 44. Do you know how much that property was worth?

[*Objected to by Mr. Hill, because the question does not discriminate as to whether the witness's actual knowledge of what the property was bought and sold for is inquired of, or whether the witness's opinion of the value of the real estate, as an expert, is inquired for; and if the latter is what is asked for, then the question is objected to because the witness is not first shown to be competent to testify as an expert upon such matters.*]

A. It might have been worth two thousand dollars.

Cross-Q. 45. Do you know when he bought it and when he sold it?

A. I think it is about five years ago that he bought it; I can't tell you when he sold it, or whether he really sold it; I am not certain.

Cross-Q. 46. Do you know whether he ever owned any real estate before he owned that?

A. I never knew him to own any before, nor I don't think he possibly could have owned any before; he lived right aside of me since 1844 up to 1867.

Cross-Q. 47. Do you know of his having any interest in a faucet business, that was carried on in his shop, in 1869 or 1870, or thereabouts?

A. Yes, sir, I do; Mr. Drawbaugh told me himself that he had an interest in it.

Cross-Q. 48. Do you know whether he managed the manufacturing business of the faucet company?

A. I suppose—I think—you see it was a stock company, and I supposed he had some stock in it when he said he had an interest in it; whether he meant, when he said so, that he had a manufacturing, as you say, or a stock, that I cannot tell you.

Cross-Q. 49. In your answer to the thirteenth interrogatory, you said, "I am certain I seen several instruments soon after I moved to New Cumberland," referring to talking-machines; did you see any other talking-machines, about that time, except the three which you have referred to?

A. No other ones, to my recollection, but those laying right before me, here [indicating machines "A," "B," and "F]."

Cross-Q. 50. Did you ever see any talking-machines of his after you saw these?

A. No, sir; not to my recollection.

Cross-Q. 51. You said, if I recollect correctly, that during '71, '72, and '73, you were frequently at Mr. Drawbaugh's shop, but that you have not been there very often since. Did you see these machines, during the years that you went there frequently?

A. I did—those machines. He has a little back office, and I seen them mostly laying on a bench there, and he showed them to me, too. I might have seen other ones, but I don't recollect it certain, whether I did.

Cross-Q. 52. After '73, when you didn't go there so often, did you see these machines?

A. I seen them once in a while, not very often, though.

Cross-Q. 53. In your answer to the 36th interrogatory, which refers, as I understand it, to the years '71, '72, and '73, you used, among other words, this language: "He would always show me and explain to me; but if you mean about working at it, I don't know how to put that in. I suppose he was working at it." "I didn't see him working at it." As he seemed to talk with you frequently about these machines, don't you remember anything more what he said than what you have stated?

A. When I talked about his explaining to me, he would more fully show me the clock and what effect electricity had, and among it then, he would then state that it would carry sound by it, then, but he would not explain. He said he could do most anything with electricity—that is as near as I can get at it. He would not handle these things here, but he would explain that to me. During the time when I moved to New Cumberland, from 1867 till 1870, during that time we talked more about this carrying sound by wires than we did afterwards. After I moved to Shiremanstown we didn't talk so much about it.

Cross-Q. 54. In the 35th interrogatory you were asked what he said about the talking-machine during the years '71, '72, and '73, and your answer was, "He did. He said that he would have it completed." Can you remember more particularly what he said about having it completed?

A. Nothing more than it would answer the same as the telegraph. He didn't say how it would be done, no more than by carrying the sound. He didn't say how it would be operated—not that I recollect. He said it would come much cheaper than the telegraph. That is all I recollect; it is so long.

Cross-Q. 55. What clock did he refer to or explain to you?

A. He had a clock that was going there by wires placed in the ground. I don't know how it is made, but the clock runs, at any rate, without any other thing to move it.

Cross-Q. 56. Did he call it an electric clock, or a magnetic clock?

A. I don't know that—I don't recollect what he called it.

Cross-Q. 57. Did you see the clock at the same times that you saw the talking-machine?

A. At the first, before I moved to New Cumberland, I don't think he had the clock then; I don't believe he had then; it was then that I spoke about the first—if my recollection serves me right—it was altogether on talking through the wires, but here of late, since I went to Shiremanstown, I know he explained about the clock a little more. I don't know whether I seen the clock first when I seen the talking-machines, but I did afterwards, I believe, at the same time that I saw the talking-machines.

Cross-Q. 58. Do you recollect how early it was when you first saw the clock?

A. I don't recollect exactly; I think the first I seen the clock operate was about 1870.

Cross-Q. 59. Did you ever see more than one clock of that kind at his place?

A. I don't believe I did; I don't think I did.

Cross-Q. 60. Do you remember whether he said anything about getting a patent on the clock, or what he expected to do with it?

[*Objected to by Mr. Hill, as irrelevant and immaterial.*]

A. I think he said that he would try for a patent, or something of that sort; I think he said so.

Cross-Q. 61. Did he say anything about manufacturing and selling the clocks?

[*Same objection, so far as the question relates to anything then in the future.*]

A. I don't think he did.

Cross-Q. 62. Were you at Mr. Drawbaugh's place, more or less, during the years '77, '78, and '79?

A. I was there several times—not often.

Cross-Q. 63. Did you see any clocks when you were there at those times?

A. I don't mind of seeing any.

Cross-Q. 64. Do you remember seeing any talking-machines during those visits?

A. No, sir.

Cross-Q. 65. Do you remember any business that was carried on at Mr. Drawbaugh's shop after you removed to Shiremanstown?

A. I do. They were making faucets and spindles. Captain Moore and a company were making spindles for carriages and vehicles. That is principally all that I recollect; I didn't get down there very often.

Cross-Q. 66. In what years was the faucet business carried on, and who was connected with it?

A. I think about '74 and '75 that Houck and his company carried on the faucet business there, and soon after Captain Moore and others had the spindles.

Cross-Q. 67. How long do you think the spindle business was carried on there?

A. I don't think more than about a year.

Cross-Q. 68. After that business was stopped, was any other business carried on?

A. I don't know of any others, except a year or two ago a company started making faucets again.

Cross-Q. 69. Who was in that company?

A. I don't know anything more than I am told that a man named Mr. Chellis is the principal man.

Cross-Q. 70. Do you understand that this last faucet is one which Mr. Drawbaugh invented?

A. I understood so.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 26th day of April, A. D. 1881.
FRED. M. OTT,
Examiner.

C. EBERLY.

Adjourned for dinner.

April 26, 1881, 2.20, P. M.

Examination resumed, pursuant to adjournment.

Present same counsel.

JOHN M. WAGGONER, *being produced, affirmed, and examined, saith, in answer to interrogatories, as follows:*

Examination by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. I was fifty-seven years, January 29th; I live in Carlisle, Cumberland county; my occupation is electrician, and has been for some years.

Q. 2. What do you do with electricity in your profession?

A. Cure diseases with it.

Q. 3. Are you also engaged in store-keeping or any other business?

A. Yes, sir; I have a small grocery, that I am back and forward in, when I am not otherwise engaged, running electricity, or operating with electricity.

Q. 4. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county. If so, how long have you known him?

A. I know him, and I have known him for twenty-five years.

Q. 5. Did you ever see any talking-machines at his shop at Eberly's Mills, Cumberland county? If so, when did you first see them?

A. I did in 1874, the week after election—fall election.

Q. 6. How do you fix the year 1874 as the year?

A. Because I was peddling horse and cattle-powder, essences, and drugs the fall of that year, and no other fall before or since.

Q. 7. How did you happen to go to Drawbaugh's shop, that fall, the week after the election?

A. To get one of my batteries repaired; I took one of them there to get it repaired.

Q. 8. How do you fix the time as the week after the election?

A. Because the week of the election, I was driving through the upper end of Cumberland county; I started after I voted on Tuesday. The other reason is that that same week my wife and youngest son went to Perry county, on a visit to see our friends; all these things I remember.

Q. 9. Can you identify any of the talking-machines you saw at Mr. Drawbaugh's shop the week after election?

A. Here they are [pointing to machines marked "B," "F," and "A."]

Q. 10. Did Mr. Drawbaugh talk through them, or did you hear them talked through?

A. He did not talk through them, nor I did not hear them talked through.

Q. 11. In what room did you see those machines?

A. In his private room where he experimented, in the shop.

Q. 12. Were the machines lying exposed to sight when you went into the room, or did he expose them while you were there?

A. He took them out of a cupboard and showed them to me.

Q. 13. Did you see any electric clock or clocks while you were there?

A. I saw one; at that time I saw but the one.

Q. 14. Did you ever see any electric clocks afterwards?

A. I saw the same one afterwards, and I saw others there, too.

Q. 15. Did he ever show you the talking-machines afterwards?

A. No, sir; never.

Q. 16. Where were the electric clocks when you saw them—in a cupboard or on the wall?

A. They were in his private room in the shop. One was attached to the wall, the other was in a case standing up against the wall.

Q. 17. The same room in which the talking-machines were kept in the cupboard?

A. Yes, sir.

Q. 18. Do you remember making any remark to him about the clock at that visit in 1874? If so, what was it?

A. I didn't make any remark about the clock, but about the talking machine.

Q. 19. What were the face and hands of the clock which you then saw there made of?

A. Wood.

Q. 20. What was the remark you made to him about the talking-machines at that time?

A. I told him that they looked very much like a boy's play-things.

Q. 21. What did he say to that?

A. He said that he had got it to perfection; that he was sure it would work, and that he was going to get it patented. He further said that it would do away with a great deal of telegraphing, and that there

Cross-Q. 38. Did you understand him to mean that the things were complete and in condition to work as they then were?

A. Yes, sir; that is what he said, when they are put together; he says "when they are put together; I am sure they will work," and that he was going to get out a patent for it.

Cross-Q. 39. Did you understand that he was going to get out a patent right away?

A. He did not positively say. He just said he was going to get out a patent for it. I supposed from his talk that he was going to do it before a great while, although he did not say so. He specified no time.

Cross-Q. 40. How soon after that were you at his shop again?

A. I was not there at his shop, after that, not for some four months, and then I remained but a few minutes.

Cross-Q. 41. How long did you remain at the time you saw the talking-machine?

A. I was there about one hour, in all, at that time. I will add that, at that time, I went there on other business. I went there to get a battery repaired.

Cross-Q. 42. What else did you talk about while you were there?

A. We talked about the repairing of the battery, and he told me he would fix it in a different shape from what it had been; that is, the part that was worn out. And he showed me how he would fix it, and that took a good part of the hour.

Cross-Q. 43. How often did you visit him during the next two or three years?

A. I was there on Thanksgiving day, 1875, getting a battery repaired, and I was there in March, 1877, getting a battery repaired, and not since; and during all that time there was nothing said about the telephone, or talking-machine, as he called it.

Cross-Q. 44. Did you see the electric clock at both these other times?

A. I saw the electric clocks at both the other times, but there was nothing said about the clocks or talking-machine.

Cross-Q. 45. What did he say about the clock the first time?

A. He told me it was worked by electricity, and he showed me how. He showed me where he had his battery fixed, as he called it, in the earth.

Cross-Q. 46. Did he say anything about patenting it, or what he thought it was worth?

[*Objected to by Mr. Hill as immaterial and irrelevant.*]

PHONE COMPANY,-1

A. He didn't say anything at all about the clock, whether he was going to have it patented or not. The only thing he talked about having patented was the talking-machine.

Cross-Q. 47. His mind seemed to be full of patenting that machine, did it not?

[*Objected to as incompetent, only his statements being evidence.*]

A. Yes, sir; he talked very much in favor of having it patented, and said that he would have it patented.

Cross-Q. 48. I judge from what you have said, that you are not only relatives, but that you are on quite friendly and confidential terms.

A. We are; anything further than that, he attends to his business and I attend to mine; we don't work for each other's pockets; each man's got to work for himself; we are no way connected in business.

Cross-Q. 49. I suppose you have heard within the last three or four years of the introduction of the telephone into use in various places?

A. I did, sir; I heard it by reading the papers—the Philadelphia *Record* in particular.

Cross-Q. 50. How long ago was it that you first heard of it?

A. Well, within the last two or three years, and particularly last fall. I paid very little attention to it, until last fall, or rather in the winter, perhaps.

Cross-Q. 51. When were you first spoken to about testifying as to these talking-machines that you saw at Drawbaugh's shop?

A. It was last fall, or rather the beginning of winter; I think it was the last part of November, or fore part of December. I don't recollect the date. He was in Carlisle at my house; I don't recollect the date; I know the weather was getting pretty cold, anyhow.

Cross-Q. 52. Did you give him an affidavit about the machines?

A. I did.

Cross-Q. 53. Who was with him at that time?

A. Mr. Jacobs.

Cross-Q. 54. They had the machines with them, had they not?

A. Yes, sir; these machines they had along.

Cross-Q. 55. You had not seen the machines, I suppose, before then, since you saw them at Drawbaugh's shop?

A. No, sir; I saw them in Carlisle last fall; that was the second time, and now, here to-day, is the third time.

Cross-Q. 56. How far is Carlisle from Eberly's Mills?

A. It must be in the neighborhood of eighteen miles; I don't know, but I would suppose it was about that.

Cross-Q. 57. You mentioned two or three times that you were at Drawbaugh's shop after you saw the machines there; were those the only times that you and he met, until he came to your place last fall?

A. At his shop they were. I met him two or three times in Carlisle, but we didn't stop long, and then he went after his business, and I went after mine. He is one of the kind of men who don't hold still long. When he is away from home, he attends to his business, and then goes home.

Re-direct examination by Mr. Hill:

Q. Q. 58. At the time you made the affidavit for Mr. Jacobs and Mr. Drawbaugh, before what justice or notary was the affidavit made?

A. Mr. A. L. Sponsler, Esq., of Carlisle.

Q. Q. 59. When they took the affidavit, did they show you the machines first, and then ask you about them, or did they first get your statement of facts, and then show you the machines to see whether you could identify them?

A. They showed me the machines first, and asked me whether I had ever seen the like before, or not. I told them that I had, and that it was his talking-machine that he had showed me in 1874. He asked whether I could be qualified to that fact. I told him that I could. He then took my affidavit.

Q. Q. 60. Do you know whether that was on the sixth day of last December?

A. I could not swear to that; I know that it was either the last part of November, or the fore part of December. I know that it was pretty cold; overcoats were pretty comfortable. I am satisfied from a memorandum now shown me by Mr. Hill that it was the sixth day of December, 1880.

Examination taken, reduced to writing, and by the witness subscribed and affirmed to, April 26, 1881.

FRED. M. OTT,
Examiner.

JOHN M. WAGGONER.

Adjourned until 9.30, A. M., 27th inst.

EPHONE COMPANY,-1

April 27, 1881, 10, A. M.

Examination resumed, pursuant to adjournment.

Present, Mr. Smith for complainants and Mr. Hill and Mr. Jacobs for respondents.

MICHAEL KONN, *being produced, sworn, and examined, saith:*

Examination by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. Fifty-two; York county, Fairview township, is my residence; occupation, a laborer.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county? If so, how long have you known him?

A. I have known him for twenty-five years.

Q. 3. Do you know John M. Waggoner, who now lives in Carlisle, Cumberland county?

A. I didn't know him when I seen him there, but they said afterwards that it was him.

Q. 4. Saw him where?

A. At Mr. Drawbaugh's machine-shop. He was in there and I came in.

Q. 5. When was that?

A. In 1874.

Q. 6. At what time in 1874?

A. I couldn't recollect exactly the time—it was about the election.

Q. 7. In the fall?

A. Yes, sir; it was in the fall.

Q. 8. How do you know that it was in the year 1874?

A. It was in the year I moved to Milltown.

Q. 9. When did you move to Milltown?

A. The last Thursday in March, 1874.

Q. 10. Now, do you mean that in the following fall you were in Mr. Drawbaugh's shop, and saw a man there, and afterwards were informed that that man was Mr. Waggoner?

A. Yes, sir.

Q. 11. How soon afterwards were you informed that that man was Mr. Waggoner?

A. I was told that day that that man was Mr. Waggoner.

Q. 12. Was Mr. Waggoner in the shop with Mr. Drawbaugh when you went there that day?

A. Yes, sir.

Q. 13. Who went away from the shop first, you or Mr. Waggoner?

A. I did; I went away first.

Q. 14. Then you found Mr. Waggoner with Mr. Drawbaugh, and you left him there with Mr. Drawbaugh; is that the fact?

A. Yes, sir.

Q. 15. Did you stay there long enough to find out what Mr. Waggoner was there for? If so, what was it?

A. He was there on a shocking-machine Mr. Drawbaugh was repairing and fixing for him.

Q. 16. Do you mean a machine for giving electric shocks to people?

A. It's more than I can tell you about that. It was a shocking-machine that he was fixing and repairing for him.

Q. 17. While you were there with Mr. Drawbaugh and Mr. Waggoner at that time, did you see Mr. Drawbaugh showing any other machine and explaining it to Mr. Waggoner? If so, what was it?

A. He was showing this electricity machine, [indicating machine marked "A."]

Q. 18. Do you distinctly remember this machine marked "A" as being the machine that was there at that time?

A. Yes, sir.

Q. 19. State whether you ever saw Mr. Waggoner in Mr. Drawbaugh's shop at any other time than the one you have referred to.

A. No, sir; I have not.

Q. 20. Do you remember whether you heard anything said between Mr. Drawbaugh and Mr. Waggoner, at that time, as to what this machine marked "A" was for?

A. Not more than I heard them saying it was for electricity.

Cross-examined by Mr. Smith:

Cross-Q. 21. How long were you in Mr. Drawbaugh's shop at that time?

A. I couldn't recollect exactly. I didn't pay any attention to it at the time. No, sir.

Cross-Q. 22. What did you go there for?

A. I didn't go there for any particular business, at all. I just went in there merely and happened to be there.

Cross-Q. 23. Can you describe the shocking-machine which they had there?

A. No, sir; I didn't see the shocking-machine. They were talking about it, but I didn't see it.

Cross-Q. 24. How long did you hear them talking about the shocking-machine?

A. Oh, well, I don't know how long. I just heard them talking a few minutes about it. That was all I heard them.

Cross-Q. 25. How long after you went away was it that Mr. Drawbaugh told you that was Mr. Waggoner?

A. He called him Mr. Waggoner while I was there, you see. I didn't know who the man was at first, until he called him Mr. Waggoner.

Cross-Q. 26. How often did you go to Mr. Drawbaugh's shop after you went to Eberly's Mills to live?

A. That would be hard for me to tell. I could not tell such a thing as that, as I didn't keep account.

Cross-Q. 27. How long did you live at Eberly's Mills?

A. Four years.

Cross-Q. 28. During the remainder of the four years after this visit, did you go into his shop from time to time?

A. Oh, yes; I have been in different times; afterwards I went in.

Cross-Q. 29. But you can't give me any idea how many times, can you?

A. No, sir; I couldn't tell. I never kept an account.

Cross-Q. 30. Can you tell what business you saw carried on there in '75, '76, and '77, down to the time you left?

A. No, I couldn't tell you; there was a good many businesses; a great many articles were made there.

Cross-Q. 31. Can't you tell me what some of them were?

A. He worked at this telephone business, and he worked at clocks.

Cross-Q. 32. In what years did you see him working at clocks?

A. About '76; he was working at it then; I think so; I don't recollect; I didn't keep account of it; he was working at the clock, still.

Cross-Q. 33. Do you remember how many clocks you saw there at any time?

A. Indeed, I couldn't tell exactly. I suppose, maybe, two, or three, or something like that.

Cross-Q. 34. Was he working at the telephone business at the same time he was at work on the clocks?

A. That is more than I can tell you. I heard him talking about it—working at it; I don't know, I didn't see it.

Cross-Q. 35. What did you hear him say about it?

A. I didn't hear him say anything more, than he said he was working at it.

Cross-Q. 36. Did you hear him say that more than once?

A. No, I don't know as I did. I heard other ones talk about it.

Cross-Q. 37. What other persons did you hear talk about it?

A. I heard different ones, I don't recollect who they were; I often heard them say Dan was working at it; that is about all.

Cross-Q. 38. Is that all that you heard them say?

Q. Yes, sir.

Cross-Q. 39. Did you ever see Mr. Waggoner after that time?

A. No, sir; I never did.

Cross-Q. 40. When were you first spoken to about giving testimony in relation to that visit to the shop?

A. The 26th of February, I think it was; the 26th or 25th, I won't say which it was; it was one of the two.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me this 27th day of April, 1881.
FRED. M. OTT,
Examiner.

MICHAEL KONN.

GEORGE FREESE, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. I was sixty-two the sixth of March—going on sixty-three; I live in Shiremanstown; I had been Burgess of that place; I am, by occupation, a tailor.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county?

A. Yes, I do.

Q. 3. How long have you known him?

A. I have known him from a boy yet.

Q. 4. Do you recollect making a coat for Mr. Drawbaugh, the price of which was two dollars and a half?

A. I do.

Q. 5. Do you remember about when it was that you made that coat?

A. In my estimation, it was about between eleven and twelve years ago.

Q. 6. Do you recollect Mr. Drawbaugh's paying you for that coat, and how he got the money?

A. Yes, I do; I went to his shop and I asked him how it would suit him to pay that small bill. I then told him I was after that $2 50; that this was the third time I had came after that money; then I told him, "Dan, it seems to me you are pretty hard run." He then had, I think, this very identical thing here [indicating machine "B."] He tried to draw my attention to this machine, and my attention was after the two dollars and a half. He plead poverty; he told me that I should go—I don't know the length of the end of the shop—and he talked through a concern something like this, and I was at the far end of it. This instrument that he had I thought was so insignificant in my estimation I thought it was hardly anything. Says he, "George, if I have this thing accomplished;" then he was working, and had kind of a wire stretched along from this arrangement here to where I was. I think he had something else there that I was to listen to. I then told him this, I still had in my mind that he was drawing my attention to this kind of foolery. I was after the two dollars and a half—didn't care about his infernal machine. I then said, "Dan, if you don't make a fool of yourself as you did about the faucet." Says he, "George, my fortune lies in this, but I am too poor," says he, "unless I have friends that will stick to me." I then asked him—I then told him, "If I had the head you have, and had the article as you say you've got here, and was as confident as you are what this would be—it would be a great thing; this will beat the telegraph." "Oh," says he, "it is not on the same principle as the telegraph; it is better than the telegraph, it works by electricity," I think he said. I didn't pay attention; it was the two dollars and a half I was after; I didn't care nor understand about his machine. After he showed me this machine, this instrument, [indicating "B,"] or something like it—he is right behind me now—says I, "Dan, I am after the two dollars and a half." Says he, "You must be damned hard run." "Not so very, Dan," says I. Says he, "If you are so very hard run I will get it for you." "All right," says I, "that is business on the first floor." "Then," he says, "come along, and I will get the money for you," and we went to Yetter's hotel. There he borrowed the two dollars and a half and gave it to me.

Q. 7. From whom did he borrow the two dollars and a half?

A. From Mr. Yetter, there.

Q. 8. Mr. Henry Yetter, who is now present?

A. That is the gentleman he got it from.

Q. 9. Did Mr. Drawbaugh talk through the machine to you while you were in the shop?

A. Yes.

Q. 10. Were you in the same end of the shop with Drawbaugh when he was talking through the machine, or were you in one end and he in the other?

A. He was at one end and I was at the other.

Q. 11. Did you put your ear to the machine and hear what he said through it?

A. Not close to the machine—just on the outside of the machine, merely. I heard what he said through it distinctly, as though he was alongside of me, when he spoke that at the other end.

Q. 12. Was that the first time you had heard of his talking-machine, or had you heard of it before?

A. Yes, sir, the first time; hold up—I think that he talked about that machine six months before that, but that is the first time that I discovered it rightly.

Cross-examined by Mr. Smith:

Cross-Q. 13. Did you give a deposition, or affidavit, some time ago, with respect to this interview with Drawbaugh? If so, how long ago, and who was present?

A. I can't exactly tell the time—a month or two ago; it might be longer, too. 'Squire Bowman, and Drawbaugh, and a lawyer that they have here—Jacobs—were the three men.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, April 27, 1881.

FRED. M. OTT,
Examiner.

GEORGE FREESE.

EPHONE COMPANY,-1

HENRY YETTER, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. My age is all but sixty-three; will be sixty-three years old by the twenty-second of November next; residence, East Pennsboro' township, Cumberland county; occupation, at the present time, a farmer.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county? If so, how long have you known him?

A. Yes, sir; I know him some twelve years.

Q. 3. Did you at one time live at Eberly's Mills? If so, when did you commence to live there, and how long did you live there?

A. I moved there, I am not positive whether it was the second or third of April, 1869, and lived there 'till March, 1870, not quite a year, when I moved out of it.

Q. 4. While you lived there, did you keep a store or tavern, or both?

A. I kept a tavern there, and also carried on butchering at the same time.

Q. 5. Have you heard the testimony given here this morning by Mr. George Freese?

A. Yes, sir.

Q. 6. State whether you have any recollection of the circumstance mentioned by Mr. Freese in his testimony, of Daniel Drawbaugh's borrowing two dollars and a half from you.

A. Yes, sir; I have. September the 17th, 1869, I loaned Dan Drawbaugh two dollars and fifty cents to pay Mr. Freese.

Q. 7. Did you understand at the time what it was to pay Mr. Freese for?

A. Yes, sir; the same time Mr. Freese told me it was for a tailor bill.

Q. 8. Did you make an entry of it on your account-books at the time?

A. Yes, sir; I did; I charged Mr. Drawbaugh with two dollars and fifty cents in cash. I have the account with me.

Q. 9. Will you please produce your account-books, and point out the charge, so that the examiner may copy it upon the record?

A. Yes, sir. This was a pass-book in which I made my first entries, and from this posted on to the ledger. This is the item:

1869.
Sept. 17, Daniel Drawbaugh, Dr.
To cash, $2.50.

This is the ledger:

Daniel Drawbaugh, Dr. to H. Yetter.
Sept. 17, To cash, $2.50.

[The date at the top of page is 1869.]

[*The examiner certifies that the above entries are correctly copied from the two books produced.*]

Q. 10. Did you have a running account with Mr. Drawbaugh during the time you were in business at Eberly's Mills, for meats and similar articles furnished by you to his family?

A. Yes, sir; I have; from April 13 to very shortly before I left, in March, 1870.

Q. 11. What were Mr. Drawbaugh's financial circumstances during that time?

A. Poor; very poor. He hardly had any money. What little money he earned he had to take to buy materials for something else he was working at.

Q. 12. Was he able to pay up his account while you lived there, or did it remain open until long afterward?

A. He wasn't able to pay his account during the time I lived there. I suppose about in March his bill was running on pretty heavy, and he done some work for his brother, making some very heavy cider-press screws. His brother was a distiller and his brother wanted Dan to take a barrel of apple-jack whiskey. It wasn't a very prime article. He took it in payment of the screws, providing he could sell it to me. Dan and his brother came to see me, whether I wouldn't take the barrel of whiskey. Dan stated to me that he would owe me a pretty heavy bill, that he was not able to pay me, that his brother would give him some time to wait for the balance that he (Dan) would owe him. So I came to the conclusion that I would better take the whiskey and sell some by the gallon at cost than run the risk of not getting anything.

Q. 13. Did that barrel of whiskey offset the whole of the account, or was there a balance still remaining against Mr. Drawbaugh?

A. There was still a balance remaining against Mr. Drawbaugh. It didn't cover the amount he owed me.

Q. 14. Are these account books which you have produced here in your handwriting?

A. Yes, sir.

Q. 15. And have been in your possession from that time to this?

A. Yes, sir; under a lock, too.

Q. 16. Do you know what Mr. Drawbaugh's character was for sobriety and industry?

A. Mr. Drawbaugh's character was a good character. He was industrious and perfectly honest, but poor. He would willingly pay every man he owed, if he would have the means. Always perfectly sober. I don't know that I ever seen him drink a drink of whiskey. Chance times he would take a glass of beer, but not unless somebody bought it for him. Did not, to my recollection, spend a cent at my bar while I lived there.

Q. 17. State whether you had any knowledge, at the time that you lived there, of Mr. Drawbaugh having a talking-machine. If so, what do you know about it?

A. I was in his shop pretty frequently; I have seen one part of it. I came down one day in hay-making or harvest, and I says: "Dan, what are you working at?" And he said: "Making a talking-machine." And I seen this part here [witness takes in his hand machine marked "F,"] this is the only part I remember. I had no belief in it—talking through an old broken tumbler. He might have told me more if I had any belief in it. This part here [pointing to the side of the mouth-piece of the tumbler "F"] wasn't off at that time.

Q. 18. You mean that the mouth-piece was unbroken and round?

A. Yes, sir; the same as the other piece there.

Q. 19. Did you ever see it at any other time?

A. I seen it two or three times on the bench that he was working at it to experiment.

Q. 19½. Do you mean while you still lived at Eberly's Mills?

A. While I lived there; yes, sir.

Q. 20. Did he explain the talking-machine to you?

A. Not that I remember of.

Q. 21. Did he tell you how it was to be operated, whether by electricity or otherwise?

A. He was talking something that he would operate it by electricity, but being such an unbeliever in it, I kind of laughed at it. I hardly knew what electricity meant at that time, or what it was used for.

Cross-examination by Mr. Smith:

Cross-Q. 22. What was the whole amount of your bill against Drawbaugh while you lived there?

A. It was a little over a hundred and sixteen dollars; some odd cents over.

Cross-Q. 23. What was the price of the barrel of whiskey, and when was the balance paid?

A. The balance wasn't paid. The price was to be two dollars a gallon. The whiskey had been made out of pomace. After the cider had been pressed out, they took and distilled the pomace; so the whiskey wasn't proof. It might have been higher if it had been proof. It was two dollars a gallon.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 27th day of April, 1881.
FRED. M. OTT,
Examiner.

HENRY YETTER.

Adjourned until 2.15, P. M.

April 27, 2.15, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

DANIEL B. CONDRY, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. I am a miller by trade; thirty-one years of age next August; I reside at Eberly's Mills, Cumberland county.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county? If so, how long have you known him?

A. I have known him since May, 1874.

Q. 3. How long have you resided at Eberly's Mills?

A. I moved to Etter and Shanklin's mill, one quarter of a mile south of Eberly's Mills, September 9, 1875, and have resided there ever since.

EPHONE COMPANY,-1

Q. 4. Were you in Mr. Drawbaugh's shop soon after you moved to that neighborhood?

A. Yes, sir; I was in in the fall of 1875.

Q. 5. Do you remember what you were doing on Christmas day, 1875?

A. Yes, sir; Winfield Gross and I went up to Drawbaugh's shop.

Q. 6. Did you see any talking-machines there on that day?

A. I saw what he termed talking-machines.

Q. 7. Was that the first time you had seen them, or had you seen them before that?

A. That was the first time that I can remember.

Q. 8. Please look at machines now shown you, marked "A," "B," "C," "D," "E," "F," "G," "I," "K," "L," "M," "N," and a machine which I now mark "O," and state if you recognize any of them as machines that you saw on Christmas day, 1875, at Mr. Drawbaugh's shop. If so, point out to the examiner which ones you then saw.

A. This one I can remember very well at the time, [pointing to machine marked "B."] Those two also [pointing to machine marked "D" and "E."] This one also [pointing to machine marked "F."] I saw this one at that time or shortly after [taking up "A"] I can't tell whether it was on that day or not.

Q. 9. Was Mr. Drawbaugh there that day?

A. Yes, sir.

Q. 10. Did he explain how the machines were operated?

A. He said that he had used them to talk through.

Q. 11. Did he say whether they were operated by electricity or not?

A. I most think he did; I ain't positive about it.

Q. 12. Did you hear anybody talk through them that day?

A. No, sir.

Q. 13. Where were the instruments when you saw them that day—in what part of the shop?

A. On the second floor, in the back room facing Yellow Breeches creek.

Q. 14. Did he say anything at that time about the machine taking the place of telegraphing?

A. Not as I can remember.

Q. 15. Between Christmas, 1875, and July, 1880, were you, from time to time, in Mr. Drawbaugh's shop?

A. Yes, sir.

Q. 16. As you would go in there from time to time, during those years, would he continue to show you talking-machines, or not?

A. He didn't show them to me just every time I came in; but two or three times at least, anyhow.

Q. 17. The same old machines, or new and different ones?

A. He showed me different ones and improved ones.

Q. 18. Please look at these machines, marked "G," "K," "L," "M," "N," "O," and state whether you recognize any of them, as among the improved machines which you saw after Christmas, 1875, at his shop.

A. I hardly know which they were; they were among these; I can't hardly tell which ones; those are some of them he called improvements.

Q. 19. Can you pick out any of these six machines last shown you and identify them as being the same, or the same in appearance, as improved machines which he showed you there after Christmas day, 1875?

A. I couldn't pick them out, but they are the same in appearance.

Q. 20. You mean they are all six the same in appearance as machines which you saw there during that time?

[*Objected to by Mr. Smith as leading.*]

A. I can't say that I saw the whole six, but some of them, at least, and they are the same in appearance with what I did see; but how many of them I don't know.

Q. 21. During that time, from 1875 to 1880, did he or did he not show you other talking-machines that are not on the table?

A. I can't say whether they are on the table or not. He showed me other talking-machines; whether these are the same ones or not I can't say.

Q. 22. Did he talk to you through any of them?

A. Yes, sir.

Q. 23. In what part of the shop were you, and in what part was he, when he talked to you through the machines?

A. I was on the lower floor, or ground floor, and he was on the second floor, next above where I was.

Q. 24. You were on the first floor from the ground, were you?

A. Yes, sir.

Q. 25. Could you hear, and understand distinctly, what he said when he talked through the machine to you?

A. Yes, sir.

Q. 26. Do you remember whether the machines were connected by wires, when he was talking to you?

A. Yes, sir: by wire.

Q. 27. Do you remember whether it was one of these machines, "A," "B," "D," "E," "F," that you heard him talking through, or whether it was one of these later machines, "G," "K," "L," "M," "N," "O," or machines like these later machines?

A. They were machines that had the appearance of these machines, [pointing to "G," "O," and "L,"] something on that order. It was not one of the machines "A," "B," "D," "E," "F."

Q. 28. To the best of your recollection, how long after Christmas, 1875, was it when he talked to you through these machines, as you have testified?

A. I could not say. Probably one or two years afterwards.

Q. 29. Did you see the wire or wires that were stretched out along the creek at one time to a stump

A. Yes, sir.

Q. 30. Did you talk through the machine when it was connected to those wires along the creek?

A. No, sir.

Q. 31. Did you ever talk through the machine except that once, of which you have testified?

A. Not as I can remember. I don't think I have.

Q. 32. When Mr. Drawbaugh first showed you these two machines, ("D" and "E,") on Christmas day, 1875, did he show you how they were to be used—how they were to be placed to the mouth or ear?

A. Yes, sir.

Q. 33. From Christmas day, 1875, to July, 1880, about how many times a year were you in Mr. Drawbaugh's shop, to the best of your recollection?

A. I can hardly tell. I went up there several times on business; different times to get a spindle turned up; several times to get a red staff straightened up and trued, and other jobs I had up there with Mr. Drawbaugh.

Q. 34. From all you saw and heard at Mr. Drawbaugh's shop, during your several visits there, from 1875 to 1880, what would you say as to his continuing his talking-machine business right along from 1875 to 1880?

A. To the best of my knowledge, and from what I have heard, he was working at it all the time; that is, not just all the time, but improving it.

Q. 35. State, if you know, what his financial condition was during all that time.

A. It wasn't just so good. People all counted him pretty slow pay. In fact, one time I was ordered not to trust him at the mill—and I think that is bad enough—for any flour or feed.

Q. 36. Do you know what his general reputation was in the community there, for honesty, temperance, and industry?

A. Good; I never heard anything about his honesty or dishonesty; never knew him to be intemperate; he was always industrious; people counted him a genius; said he worked hard.

Q. 37. Was Winfield Gross ever in Mr. Drawbaugh's shop with you more than that once?

A. Not as I can remember; he might have been.

Cross-examined by Mr. Smith:

Cross-Q. 38. What work or business was carried on at that shop after 1875?

A. As far as I know, there was working at some kind of electric clock one time; next time faucets. I hardly know what, but them two articles I know he was working on—clocks and faucets.

Cross-Q. 39. Were there any clocks there when you went there on Christmas, 1875?

A. I think there was. I ain't positive, but feel sure there was.

Cross-Q. 40. How many?

A. I hardly know how many there were at that time, but I saw as many as two or three, different times, when I was there.

Cross-Q. 41. Do you know whether anybody was interested with Drawbaugh in carrying on the faucet business at that time, after 1875?

A. I hardly know whether there was the first time I saw it, but later there is.

Cross-Q. 42. When did you first see the faucet business going on?

A. I saw it different times when I was there, between 1875 and the present day. I couldn't state when I first saw it.

PHONE COMPANY,-1

Cross-Q. 43. Whom did you understand to be interested with him in that business?

A. Mr. Chellis—Edgar W. Chellis.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to this 27th day of April, 1881.
FRED. M. OTT,
Examiner.

D. B. CONDRY.

Adjourned until April 28, at 10 o'clock, A. M.

April 28, 1881, 10 *o'clock*, A. M.

Examination resumed, pursuant to adjournment.

Present, Mr. Storrow and Mr. Smith for complainants, and Mr. Hill and Mr. Jacobs for respondents.

JEREMIAH FRY, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. My age is forty-seven; residence, Shiremanstown, Cumberland county, Pennsylvania; I have been farming tobacco during the last year; I kept store for several years before the last year.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pennsylvania?

A. Yes, sir.

Q. 3. How long have you known him?

A. I knowed him before I moved there. In 1875, I moved there, and then I knowed him; knew him by sight before that time. Since 1875, I had dealings with him.

Q. 4. Did you move to Eberly's Mills in 1875? If so, what was the time of year when you moved there?

A. I did; the last of March—towards the last of March.

Q. 5. How long did you live there after moving there in March, 1875?

A. Five years.

Q. 6. A young man named Jacob B. Fry has testified as a witness in this case; is he your son?

A. Yes, sir.

Q. 7. After you moved to Eberly's Mills, did you ever see any talking-machines in Mr. Drawbaugh's shop there? If so, how soon after you moved there?

A. About the ninth day of April, 1875, I saw talking-machines in his shop.

Q. 8. What makes you fix the date as about the ninth of April, 1875?

A. He was talking for some potatoes, and I went down that day and I sold him some.

Q. 9. Did you make a memorandum of the sale of the potatoes at that time?

A. Yes, sir.

Q. 10. Have you looked at that memorandum to verify the date?

A. Yes, sir.

Q. 11. When did you look at it?

A. This morning I looked before I left home; I also looked some time ago.

Q. 12. Do you remember how many talking-machines you saw at his shop, on or about the ninth day of April, 1875?

A. One; that was a glass tumbler, tin box, and a couple of other pieces.

Q. 13. Please look at the instruments now shown you, marked "A," "B," "C," "D," "E," "F," "G," "H," "I," "J," "K," "L," "M," "N," "O," and see if any of them are the machines which you saw there at the time you sold the potatoes to him; and if so, please point out the machines which you saw to the examiner.

A. This here [indicating "B"] Mr. Drawbaugh showed me first; the tumbler also [marked "F"]. He showed me these here [pointing to "D," "E," and "A."]

Q 14. Did he talk through any of the machines to you at that time?

A. He sang.

Q. 15. Could you hear him through the machine when he sang into it?

A. Yes, sir.

Q. 16. Did he tell you at that time what the machine was for? If so, what did he say?

A. Talking-machine.

PHONE COMPANY,-1

Q. 17. Did he tell you whether it worked by electricity, or not?

A. I don't mind that any more.

Q. 18. Did you ask him, or did he tell you, how far he could talk through the machine? From one floor to another?

A. I asked him how far he can talk; as far as the wire goes, he said.

Q. 19. Do you remember and can you point out the machines which he talked into, and which you listened at, when you heard him sing?

A. I can't just say which one; it was one of these here, or one like them [indicating "D" and "E"]. I can't tell exactly which one it was.

Q. 20. Do you mean that you can't tell exactly which of the two it was?

A. Yes, sir; it was one like one of these here; I can't tell just which one I did see [pointing to the instruments "D" and "E"].

Q. 21. From that time to the time when you moved away from there, in 1880, were you in his shop, from time to time every year, or not?

A. Yes, sir.

Q. 22. As near as you can remember, about how often were you in there each year?

A. About ten or twelve times.

Q. 23. During the first year, after you saw the machines in 1875—I mean during the year 1876—did you see any talking-machines there that you had not seen before?

A. Yes, sir.

Q. 24. How about the second year, 1877? Is it your recollection that you saw any talking-machines there that year that you had not seen before?

A. Yes, sir.

Q. 25. Answer the same question as to 1878.

A. Yes, sir.

Q. 26. How about the next year, 1879? Answer the same question as to that year.

A. Yes, sir.

Q. 27. Can you point out any of the machines on the table that you saw there in 1876, 1877, or 1878 that you had not seen before?

A. I don't know whether I can, just. I seen one of these here; I can't tell you which one it was, and I seen the improvements on it. I know it was different from the first. I can't point out which one I seen every year, but I seen improvements on it every year.

Q. 28. Do you recollect at any time seeing this machine [handing the witness machine "C"] there?

A. Yes, sir.

Q. 29. Was that the first time that you saw the machines or afterwards?

A. The first I saw the machines, I saw it standing there.

Q. 30. Do you recollect at any time seeing these two machines, [indicating machines "H" and "I,"] or either of them?

A. Yes, sir.

Q. 31. Did you ever talk through any of the machines after April, 1875, to your best recollection?

A. Yes, sir.

Q. 32. A good many times or not?

A. Only once, that I remember.

Q. 33. About when was that, to the best of your recollection?

A. In the spring of 1880.

Q. 34. Do you see the machine here through which you talked, in the spring of 1880? If so, please point it out.

A. These here machines [pointing to "H" and "I"].

Q. 35. Did you keep store at one time at Eberly's Mills? If so, when did you begin, and how long did you continue?

A. I began in 1875, first of October; continued till 1878, in the spring; sold off, and didn't keep no store in 1878—from that spring on until the next spring; from 1879 to 1880 I kept store again.

Q. 36. State whether or not Mr. Drawbaugh was in the habit of purchasing in your store, during the time you traded there, articles for his family use?

A. Yes, sir.

Q. 37. All along during the time you traded?

A. Yes, sir.

Q. 38. What was his condition as to ready money to pay for those articles?

A. He always complained that he was scarce of money.

Cross-examined by Mr. Smith:

Cross-Q. 39. How large was your account against him during the time you kept the store.

A. Somewheres in forty dollars, the largest amount he owed me; I can't exactly tell you the amount; somewhere about that.

Cross-Q. 40. How much do you think he traded in that time?

PHONE COMPANY,-1

A. I can't tell, exactly; maybe a couple of hundred dollars.

Cross-Q. 41. When did you first see the machines marked "H" and "I"?

A. It was in 1879; I can't exactly just tell the time.

Cross-Q. 42. What did Mr. Drawbaugh say about these two when you saw them?

A. That it was a telephone.

Cross-Q. 43. Is that all that he said to you about them?

A. I don't remember anything more.

Cross-Q. 44. Did he say anything to you about them at the time you heard talking in them, in the spring of 1880?

A. Yes, he talked through them to me.

Cross-Q. 45. What I wanted to know was whether he said anything about the machines, whether they were an improvement or not, or anything whatever?

A. I misunderstood the question. He said it was an improvement on the telephone.

Cross-Q. 46. Is that all that you remember?

A. He talked to me through them.

Cross-Q. 47. At the time when he showed you other improvements, did he say anything to you about them?

A. Told me they were telephones; that is, first he called it talking-machines—he first said.

Cross-Q. 48. At the time you first saw the instruments "B" and "F," and "D" and "E," what did he say about them?

A. He said it was talking-machines.

Cross-Q. 49. Was that all he said?

A. I asked him then how far he can talk; then he said, "As far as the wire goes."

Cross-Q. 50. Did he tell you when he made "B" and "F"?

A. I asked him, "When did you get these up?" He said, "Several years already." I don't mind the time he said.

Cross-Q. 51. Did he say anything at that time about improving the instruments?

A. Yes.

Cross-Q. 52. What was it?

A. He said he was improving it—going to improve it.

Cross-Q. 53. Did you see those four machines, or either of them, more than once, during the year 1875?

A. Yes, sir.

Cross-Q. 54. How many times?

A. I am not able to tell how many times.

Cross-Q. 55. Do you recollect what he said about them at any of those times?

A. No, sir; I do not. I saw them lying there, but I do not recollect what he had said at any time about them.

Cross-Q. 56. Do you remember whether you asked him during that year, or any of the following years, how he was getting along with his improvements?

A. Yes, sir.

Cross-Q. 57. What did he say when you asked him that?

A. "Still improving some."

Cross-Q. 58. Do you remember when that was?

A. It was in 1876.

Cross-Q. 59. Did you have any talk with him about improvements in 1877 or 1878?

A. Yes, sir; I came down and asked him, "Still improving your telephone?" "Oh, yes," he said.

Cross-Q. 60. About what time was that?

A. Oh, I can't tell you exactly the time; I came down pretty often.

Cross-Q. 61. Do you mean that you inquired of him pretty often about his improvements?

A. No, sir; I was down about some other business.

Cross-Q. 62. What other business did you go down there about?

A. After some money, sometimes.

Cross-Q. 63. Did you see any other business carried on in the shop during those years?

A. Yes, sir.

Cross-Q. 64. What?

A. His clocks, magnetic clocks, I guess he called them.

Cross-Q. 65. Have you, at any time before this, made an affidavit with respect to these talking-machines?

A. Yes, sir.

Cross-Q. 66. When was that?

A. I can't tell the exact day. It was last summer, or rather in the fall. From a memorandum now shown me by Mr. Hill I am now satisfied that it was the first day of September, 1880.

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Cross-Q. 67. Did you ever, while you lived at Eberly's Mills, talk with other people besides Mr. Drawbaugh about his talking-machines?

A. Yes, I talked with several persons; that it is a very good thing if he gets it accomplished.

Cross-Q. 68. With whom did you talk?

A. With some of the neighbors there and some of my relations.

Cross-Q. 69. Can you give the names of any of the people with whom you talked?

A. I can give some: Daniel Fettrow, William Dellinger, Jacob Swartz, Peter McQuait, Michael Konn, and some of my friends that stopped there at my place, and I talked to them about it.

Cross-Q. 70. Did these people that you talked to about it think it would be a good thing if he got it accomplished?

[*Objected to by Mr. Hill, as immaterial, irrelevant, and incompetent.*]

A. Yes, they all allowed it's a very good thing.

Cross-Q. 71. Do you know whether any of them had seen any of the machines?

A. Yes, my brother-in-law; I had showed them to—took him down there to see them.

Cross-Q. 72. When did you take him down there?

A. Somewheres in 1878.

Cross-Q. 73. What was your object in taking him there?

A. I was going to show him the magnetic clock.

Cross-Q. 74. And did he hear any talking through the talking-machine?

A. No, sir.

Cross-Q. 75. What did he say about them when you showed them to him?

[*Objected to by Mr. Hill, as immaterial and incompetent.*]

A. He said if he could talk through them a distance it was worth a good deal to him. I showed it to him; Mr. Drawbaugh did not show it to him.

Cross-Q. 76. Which of these machines did you show to him?

A. These small ones here—some of these here [indicating "B," "F," "D," "E," and "G," "K," "L," "M," "N," "O," and "A."] They might have been all these on the bench; I don't know whether they were or not.

Cross-Q. 77. What is your brother-in-law's name, and where does he live?

A. He lives in York county; Samuel Mummert is his name, Conewago township.

Cross-Q. 78. Did your neighbors at Eberly's Mills frequently talk about Drawbaugh's talking-machines or telephones?

A. Yes, I heard them talk of it sometimes.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me this 28th day of April, 1881.
FRED. M. OTT,
Examiner.

JEREMIAH FRY.

Adjourned until two o'clock, P. M.

April 28, 1881.

Examination resumed, pursuant to adjournment.

Present, Mr. Smith and Mr. Storrow, for complainants, and Mr. Hill and Mr. Jacobs, for respondents.

HENRY BAYLER, *being produced, sworn, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. Age, sixty-two; residence, York, Pennsylvania; at this time, not engaged in anything.

Q. 2. Are you acquainted with Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pennsylvania? If so, how long have you known him?

A. Became acquainted with him in 1873; knew him until 1876; did not hear anything of him, excepting what I seen through the papers, until a few weeks ago.

Q. 3. State how you came to make his acquaintance in 1873.

A. I embarked in the lumber business at New Cumberland with another party. He (Drawbaugh) was called down from Milltown, as it was called then, to do some little repairs to the engine.

Q. 4. Did you ever go up to Milltown, or Eberly's Mills, as it was called, to see him during 1873, '4, '5, or '6?

A. I did, by invitation from him.

Q. 5. Did you have any knowledge of his talking-machine during any of those years? If so, when first and how?

A. As near as I can tell, some time in June, 1873, I went up to Milltown, when he showed me some of his inventions spoken of before. Among others was a very crude machine, and he showed me the workings of it. After showing and explaining it, I remarked: "Why, Dan," as I familiarly called him, "that is virtually a talking telegraph," and advised him to take out a patent. Says he: "If I had the means I would. If you'll advance me the means to procure a patent, I'll give you one half interest."

Q. 6. At the time when he showed it to you on that occasion, did you talk through it or hear anybody talk through it?

A. Yes, sir.

Q. 7. Who was present besides yourself?

A. His brother—I think his name is John.

Q. 8. Was it the one generally known as 'Squire Drawbaugh?

A. I think so; I ain't positive about that.

Q. 9. State where the machine was that he was talking into, and where the one was that you were listening at, during that conversation.

A. The machine was on the table in his work-room, or office, on somewhat of a raised shelf, the wire passing out of that through another room, and into the third one, as it were; when he furnished me with a crude ear-trumpet, made out of stiff paper—heavy paper—and instructed me how to use it, whilst he went to the machine at the other end, and talked to me. I could distinguish his voice, when I remarked to him: "Why Dan, that is the talking telegraph." That is the time I had advised him to take out a patent, which he said he didn't have the means, but would give me a half interest if I furnished them.

Q. 10. Did his brother remain with you, or go with him, when he went to the other end of the shop to talk through the machine?

A. His brother remained in the office, or work-room.

Q. 11. State whether or not you did, by means of the machine, hear and understand distinctly what Mr. Drawbaugh said through it.

A. I can't recall to mind what he did say; I could only plainly distinguish his voice.

Q. 12. What I mean is, did you, at the time, plainly hear and understand what he said, though you may have now forgotten what it was?

A. By being able to distinguish his voice, I would suppose I could have understood what he said. He had been an entire stranger to me previous to the first of April, 1873.

Q. 13. Then you do not now remember whether you understood what he said, except from the fact that you distinguished his voice clearly?

[*Objected to by Mr Storrow, assuming and as leading:*]

A. I do not at this late day, as before said, remember the words.

Q. 14. State whether he talked, or sang, or whispered through the machine.

A. He talked. Afterwards he said he would talk in a very low voice; he did talk in a very low voice.

Q. 15. Did you still hear him, when he talked in a very low voice?

A. Yes, sir.

Q. 16. Did he ever show you the talking-machines afterwards, during the years 1873, '4, '5, or '6?

A. Never been into his place of business after the summer of 1873. He was frequently called to our place at New Cumberland to do some little repairs. Always pressed me to furnish him the means to get a patent.

Q. 17. How long were you connected with the lumber business at New Cumberland?

A. My partnership extended three years, from April, 1873—I think it run late in 1876 before I got out, or maybe it was 1877. I have my data at home.

Q. 18. State whether or not, during your co-partnership and until the business was closed up, Mr. Drawbaugh continued to urge you to furnish him the means for taking out a patent and to take an interest in the invention. What was the fact about that?

A. Generally on him meeting me, he would urge it—urge me to take an interest by furnishing the means to take out a patent. In 1873, on one occasion, I was almost induced to risk a few hundred dollars, and would have done so had my business progressed more satisfactorily. Owing to my partner, unknown to me at the time of accepting him, being considerable of a drinking man, which I knew nothing of at the time of accepting him as a partner, greatly worried me, which was the principle reason why I didn't take out a patent for Drawbaugh.

Q. 19. Do you think you could identify any of the machines that Mr. Drawbaugh showed you if you were to see them again?

A. I *think* I could.

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Q. 20. Do you know what Mr. Drawbaugh's financial circumstances were during the time that you were engaged in the lumber business at New Cumberland?

A. Only from hearsay, and my own knowledge is, hard to get money from; didn't ever seem to have any. For his repairs that he made for us, he would collect very close, and would want the money for the repairs if he owed us or not.

Q. 21. Did he state why he wanted the money?

A. Sometimes for provisions for his family, at other times he would not state for what purpose. Unless he was in our debt, there were no questions asked.

Q. 22. Do you know what was the common report in the neighborhood where he lived, about the condition of his family, for the necessaries of life?

A. I have heard, at the time I was engaged at New Cumberland, that he was very poor, and often did not have the necessaries.

Q. 23. State in full just what you heard about it at that time.

A. That is about as full as I can state it, excepting that I did hear that they did not know in the evening where their breakfast was to come from next morning.

Q. 24. State whether or not Mr. Drawbaugh, at one time, during your co-partnership, or at sundry times, obtained some lumber from you, and if so, when the account was settled and paid.

A. Frequently he got lumber from us. Account was settled through repairs, excepting the last bill, about the end of my business transactions there, for which I hold a lien against him or somebody else, I don't know which any more. When I left I placed the settlement of everything—the collection—and gave the party a power of attorney to close up and settle the business, and that is about the last that remains open.

Q. 25. Will you now please look at these two instruments, "B" and "F," and state whether you saw them, or either of them, at Mr. Drawbaugh's shop in June, 1873?

A. I think I recognize this as being on the raised platform in his work-room, [indicating machine "B,"] or something similar to it, unless this here [indicating machine "F"] was connected with it; there was a glass tumbler, I recollect.

Q. 26. Do you remember whether he talked into the tumbler or not, or did you see him at any time, while you were there?

A. I did not see him while I was listening; I was in another apartment.

Q. 27. When you put your ear to the paper funnel, or whatever it was, do you remember whether you put the other end of the funnel to the end of the tin box, [marked "B,"] or another similar to it?

A. I do not, sir.

Q. 28. Do you remember the fact of Hauck & Co. buying out, or taking possession of, the faucet business at Mr. Drawbaugh's shop?

A. I remember the fact. I did not know anything about it at the time I was there. I was after the faucet interest, not knowing that there had been a company formed before that, and at my first visit there, I did not know that he had sold, or that they had sold, to a Mechanicsburg party. I was only apprised of that afterwards.

Q. 29. Do you remember how long afterwards?

A. No, I don't know.

Q. 30. State your best recollection, whether it was soon afterwards, or a long time afterwards.

A. It might have been two weeks, and it might have been longer.

[*Mr. Smith left for the East about half an hour ago, and now Mr. Storrow is obliged to absent himself, but it is agreed between counsel that the direct examination of this witness may be proceeded with and closed, and that the witness shall be re-called hereafter for cross-examination. It is also agreed that when the commission adjourns to-night, it shall adjourn till next Tuesday morning, May* 3, *at* 10 *o'clock.*]

Q. 31. Will you please look at the machine marked "C," now shown you, and state whether you recollect seeing that at Mr. Drawbaugh's shop at the time of your visit there, in June, 1873?

A. It strikes me I remember seeing it there. My attention was more particularly attracted to the faucets.

[*Examination of Mr. Bayler suspended.*]

Adjourned until Tuesday, May 3, at 10 o'clock, A. M.

Tuesday, May 3, 1881, 10 *o'clock*, A. M.

Examination resumed, pursuant to adjournment.

Cross-examined by Mr. Storrow:

Cross-Q. 32. How did you happen to go to Drawbaugh's on the occasion you have referred to?

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A. By invitation from him.

Cross-Q. 33. What did he invite you for?

A. For the purpose of seeing an invention that he had there.

Cross Q. 34. What invention?

A. At the time he didn't make any mention of it, until I got to his place, when he showed me what he said would finally take the place of telegraphing.

Cross-Q. 35. Did you understand that that was the invention that he had invited you to come there to see?

A. After I got there I understood it as such.

Cross-Q. 36. Then you went there simply because he invited you to see some inventions, you didn't know what. Is that so?

A. Didn't know what at the time, but, as he stated, it might be of interest to me.

Cross-Q. 37. When did he give you this invitation?

A. In the spring of 1873. . .

Cross-Q. 38. How long before you went there did he give you the invitation?

A. It may have been a few weeks.

Cross-Q. 39. Please state your best recollection about the time.

A. That is about as near as I can get to it.

Cross-Q. 40. Did he give you the invitation by word of mouth or by letter?

A. By word of mouth.

Cross-Q. 41. Where?

A. At New Cumberland,

Cross-Q. 42. At your mill?

A. At the one we were operating.

Cross-Q. 43. I suppose when he gave you the invitation you asked him what the invention was, didn't you?

A. I don't know that I did; he was an entire stranger to me at the time.

Cross-Q. 44. What is your best recollection as to whether you did or not?

A. My best recollection is that I didn't ask him anything about it. He had been speaking about the faucets. As for the other, I don't think I asked him anything about it.

Cross-Q. 45. Had he been speaking about the other, too?

A. He told me he would show me something that might be to my interest if I came up; and I did so at my leisure, some weeks after.

Cross-Q. 46. And your visit was to see that undescribed thing which you afterwards found was a talking-machine, was it?

A. My visit was to see what he had to show me, not knowing what it would be. He, also, in explaining the talking-machine—or rather, I should have said, after explaining the talking-machine—introduced the faucets which I understood more about than the other, and was favorably impressed with the invention.

Cross-Q. 47. When did you see the instruments, "F," "B," and "C," after that visit?

A. I saw the instruments without being designated by any letters, and don't know them by letters.

[*The instruments are now shown to the witness, and, after inspecting them, he continues his answer.*]

I don't think I seen them again until probably a month ago.

Cross-Q. 48. Are they in the same condition now that they were in when you saw them at his shop?

A. They are not.

Cross-Q. 49. State where the difference is in each.

A. The principles about them are the same. These two ["F" and "B"] were, I think, connected by some means or other; this here [indicating "C"] I am not so positive about.

Cross-Q. 50. If "F" and "B" were in any different condition then from what they are now, please state all the differences.

A. I believe I have said that they were somewhat connected, but I don't remember in what way, as I paid not much attention to the instruments.

Cross-Q. 51. What part of the shop was "F" in?

A. In the office with this here, as it was shown me at the time, [indicating "B."]

Cross-Q. 52. What part of the mill was the office in?

A. Now, there is such a difference of opinion as to the location. My idea of the office was that the building was facing south and the office at the west end.

Cross-Q. 53. Was the office at the end next to the stream?

A. There was a stream in front and rear. The office was at the end of the building which was up stream.

Cross-Q. 54. As you go down the hill, near the mill, coming from Harrisburg, was the office on the side facing you or on the other side?

A. Well, I never came that road, and my visit there was the first visit in that section of country. I approached the place from, I would call it, the north side of the Yellow Breeches, from about a mile down stream, passed around the grist-mill, and down the little peninsula there to the machine-shop. Left the horse and vehicle in the neighborhood of the grist-mill and walked down to the shop.

Re-direct examination by Mr. Hill:

Q. Q. 55. If I understand the latter part of your cross-examination, you wouldn't undertake, with the limited knowledge of the locality that you have, to be sure as to the exact position of the rooms, with reference to the points of the compass, the roads, or the streams? Am I correct in this or not?

A. I wouldn't confine myself positive to the points of the compass. The general course of the stream is eastward, as I understand it. I came there from down stream, consequently passed on westward, on the north side of the Yellow Breeches, and, as before said, passed around the grist-mill and reached the shop, as stated before.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 3d day of May, 1881.
FRED. M. OTT,
Examiner.

HENRY BAYLER.

Tuesday, May 3, 1881, 10 *o'clock*, A. M.

Examination resumed, pursuant to adjournment.

Present, Mr. Storrow for complainants, and Mr. Hill and Mr. Jacobs for respondents.

By consent, the cross-examination of Mr. Bayler was suspended to examine the following witness:

DAVID B. CARL, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. About thirty-nine; Dillsburg, York county, eight miles from

Mechanicsburg, about eleven miles from Eberly's Mills, is where I live. I generally followed butchering. I am assessed as a farmer now.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county; and if so, how long have you known him?

A. I have known him since the year 1868 or 1869.

Q. 3. Did you formerly reside at or near Eberly's Mills? If so, how long, and from what time to what time?

A. I lived there four years; I moved there in the spring of 1869 and left in the spring of 1873.

Q. 4. While you lived there, at Eberly's Mills, did you or not frequently visit Drawbaugh's shop?

A. Yes, sir; I did.

Q. 5. Did you ever, at that time, see there what he called a talking-machine?

A. I did; in about the year '70, I saw it.

Q. 6. Please look at the machine marked "B," now shown to you, and state whether you have ever seen it before, and, if so, when and where you first saw it?

A. Yes, sir; I saw it. I saw it there at his shop—machine-shop there at Eberly's Mills. The first I saw it was in the year '70; I couldn't tell you whether it was the beginning or last of the year, but that year I know I saw it.

Q. 7. In what part of the shop was that instrument when you first saw it?

A. There was two rooms; there is another part that belongs to this here, and I don't remember which part was in either room; they were small rooms; one of them was about half as large as this.

[*Examiner certifies that this room is about* 17 *feet square.*]

Q. 8. Please look at the instrument now shown you, marked "F," and state whether you ever saw it before, and, if so, when and where you first saw it.

A. Yes, sir; I saw it; that is the machine that was attached to this other; I saw it at the same time.

Q. 9. Do you wish to be understood that the instrument "B" was in one room, and the instrument "F" in the other?

A. Yes, sir.

Q. 10. Do you recollect whether the two instruments were connected in any way? If so, by what?

A. They were, by a wire, like this here wire [indicating the wrapped wire on the electro-magnet of machine "B"].

Q. 11. Did you talk, or hear anybody taik, through the machines?

A. No, sir; I didn't; but Mr. Drawbaugh told me that it was calculated to be a talking-machine.

Q. 12. Did he tell you why he used two instruments?

A. Yes, sir; he said the one was to speak into, and the other was to listen at.

Q. 13. Did he, at that time, tell you how it operated?

A. Yes; he said a man could hear at one end just what a man spoke to him at the other end—hear whatever he said.

Q. 14. What, if anything, did he say about the distance to which anybody could hear words through the machine?

A. Said he could hear a man talking from that place to New Cumberland or Harrisburg, and understand distictly what he said.

Q. 15. Did you see the machines more than once while you resided at Eberly's Mills?

A. Yes, sir; I saw them more than once, but I couldn't tell you how often.

Q. 16. Did you ever hear them talked through?

A. No, sir; I never did.

Q. 17. While you were living at Eberly's Mills, what was your business?

A. I followed butchering there.

Q. 18. Did you furnish Mr. Drawbaugh during that time with meats for his family?

A. Yes, sir; I did.

Q. 19. Have you an account with him?

A. Yes, sir.

Q. 20. Have any trouble about getting your pay?

A. Pay was always very slow; I never got any amount from him at one time.

Q. 21. What did you understand at that time to be the cause of his slowness?

A. Well, he never had it; never had the money to pay it.

Cross-examined by Mr. Storrow:

Cross-Q. 22. Please fix, as near as you can, the time when you first saw these instruments "F" and "B."

A. As I said before, it was in the year '70; I can't tell you the time;

I think it was in the summer season; I am pretty sure it was. I first come to see it when I was hauling some stuff back and forth from the town for him. I generally fetched things from the shop, patterns and things for him, as I went back and forth from market.

Cross-Q. 23. What business was he carrying on at his shop then?

A. He was doing job-work generally, and working at such machines as this.

Cross-Q. 24. Was any regular manufacturing business being carried on at the shop then?

A. No, sir; there had been before that.

Cross-Q. 25. What had there been before that?

A. Manufacturing Drawbaugh's measuring faucet there.

Cross-Q. 26. What other models, or things of his invention, did you see in his shop at the time you saw "F" and "B"?

A. I remember of seeing his patent nail-feeder there.

Cross-Q. 27. What else?

A. I don't remember of anything else—not until afterwards I saw several other things there after I saw this.

Cross-Q. 28. What did you see there afterwards of his invention?

A. I saw a battering ram for hoisting water. I seen different other little machines there. I suppose they were patterns, or models, or things lying around.

Cross-Q. 29. What part of the shop did you see "F" and "B" in?

A. I saw it on the second floor. The first floor is where you come in where the machinery is. I saw it on the second or upper floor.

Cross-Q. 30. There is a basement or cellar under the floor, which you speak of as having this machinery on, is there not?

A. Yes, sir; there is.

Cross-Q. 31. What part of the upper story did you see these two instruments in?

A. The one machine was at the west end of the shop, next the road, and the other was at the other end of the shop, next to the creek.

Cross-Q. 32. Both in one room?

A. No, sir.

Cross-Q. 33. Describe how that story was partitioned off, and which room you saw the other in.

A. These rooms were just partitioned off; one in each corner of the building.

Cross-Q. 34. Which corners, and how did the partitions run?

A. The one room was in the west end of the building, or west corner, and the other was in the opposite corner of the building, north, as near as I can tell the way the building stands—the corner up the stream of the Yellow Breeches creek.

Cross-Q. 35. Did each of these rooms run across the whole end of the building, so as to have two corners of the building in it?

A. No, sir.

Cross-Q. 36. Then, if I understand you, one room was partitioned off by one partition in one of the corners of the west end, and the other was partitioned off by another partition in the corner next the creek up stream.

A. Yes, sir.

Cross-Q. 37. What else did you see in either of the rooms where either of these instruments were?

A. The one room was used as a faucet room; the other I don't remember; there were a great many things in it.

Cross-Q. 38. Name some of the things you saw in it.

A. I seen a couple of clocks in.

Cross-Q. 39. What kind of clocks?

A. He called them electric clocks.

Cross-Q. 40. Which room were they in?

A. The one at the west end of the building.

Cross-Q. 41. Were those clocks in cases, or were their works all open and uncovered?

A. The one clock I seen there was in a case, I am sure; the others I couldn't tell you.

Cross-Q. 42. I suppose you mean that you saw these clocks at the same time you first saw "F," and "B," don't you?

A. No; it was some little time after, that I first saw these two clocks. It was in the same room, though.

Cross-Q. 43. Tell me what you saw in these two rooms, the first time you saw "F" and "B" in them.

A. The one room I can't tell you. The other room was used for nothing else but a faucet room. I couldn't name anything else particularly that was in there.

Cross-Q. 44. How soon after you first saw "F" and "B," did you see the clocks?

A. That I can't tell you. I've got no account of dates in the year.

Cross-Q. 45. How many clocks did you ever see there?

A. At any time during my visits to the shop there? I have seen four at one time, if I remember rightly.

Cross-Q. 46. When was that?

A. I couldn't give you the exact time, for I was there too often at the place.

Cross-Q. 47. In what year did you see the four clocks?

A. As near as I can tell, I think it was in '72; I ain't right sure about that.

Cross-Q. 48. Where did you go to live when you left Eberly's Mills?

A. The place I live now, Dillsburg; that is my post-office.

Cross-Q. 49. Have you ever been to Drawbaugh's shop since you moved away from Eberly's Mills?

A. I was there twice since.

Cross-Q. 50. When?

A. The first was about two years after I left, and the next was about four years, as near as I can tell you, from the time I left; I am not positive.

Cross-Q. 51. How often have you seen "F" and "B" since you moved away?

A. I haven't seen it at all; my visits were too short at that time. I didn't see anything.

Cross-Q. 52. Do you mean to say that since you moved away you have never seen "F" and "B" until this morning?

A. I saw them before, since that, but not at them two visits.

Cross-Q. 53. When did you see them?

A. About a year ago.

Cross-Q. 54. Where was it, and who showed them to you?

A. At the place I worked; they were shown to me by Mr. Jacobs.

Cross-Q. 55. Did you make an affidavit about them about that time?

A. I did, in August of the same year.

Cross-Q. 56. Who was present when Mr. Jacobs showed them to you, and who was present when you made the affidavit?

A. There was another gentleman with Mr. Jacobs, but I don't remember his name. When I made the affidavit, Mr. Jacobs and Mr. Abrams were there.

Cross-Q. 57. Anybody else?

A. Jacob E. Smith and 'Squire Clark; it was at his office, at Dillsburg.

Cross-Q. 58. Are the instruments "F" and "B" in the same condition now that they were in when you saw them at Drawbaugh's shop?

A. No, sir.

Cross-Q. 59. What are the differences?

A. There was a kind of a funnel or a covering fixed up at this end [indicating end of machine "B," furthest from the electro-magnet,] of this machine. This here [magnet] I think was larger on "B." If I remember right, there was a head over the end of the tube next to the magnet. Don't distinctly remember any other differences in "B." I don't remember any particular difference in "F," more than that he had more plaster-of-Paris inside of it.

Cross-Q. 60. How was the inside of "F" made when you saw it at his shop?

A. I know nothing more than the plaster-of-Paris that was in it; he told me that. I hadn't the machine open. The two machines were connected together with wire.

Cross-Q. 61. Was the bottom broken out of the tumbler "F" at that time?

A. No, sir; it would hardly have held what was in it, if the bottom had been out.

Cross-Q. 62. Were the instruments lying on a bench when you first saw them, or were they put away somewhere and taken out by him to show you after you got in there?

A. Just as I first stated; there was one in each room, and I can't tell you any more how they were fastened.

Cross-Q. 63. Who else was present when you first saw them?

A. I don't remember that there was anybody but myself and Drawbaugh.

Re-direct by Mr. Hill:

Q. Q. 64. You state, that when you first saw the machines, they had, before that time, been making faucets there. Do you know how long before?

A. I guess about a year before that—eighteen months, or somewhere there.

Q. Q. 65. Do you know whether they made faucets there after that time as well as before?

A. Not while I lived there, and I don't think since.

Q. Q. 66. Were you down at the shop often during the latter part of your residence there?

A. Yes, sir; I was.

Q. Q. 67. Did you move away from there before Hauck & Co. took control of the faucet business?

A. Yes, sir; I moved away there before that.

Q. Q. 68. Was there anybody besides Drawbaugh working in the shop while you lived there, to the best of your recollection?

A. Not after the faucet business stopped, excepting that he would get a hand every now and then to help him work.

Q. Q. 69. When you first saw the two clocks there, one of them, you say, was in a case. Describe the case, as near as you can; tell how large it was, where it stood, and what it stood on.

A. It stood in that room in the west end of the building. I know that the clock was as high as I am, but whether it stood on the floor, or two feet off the floor, I don't remember.

Q. Q. 70. Did it look like an old piece of work?

A. No, sir; it was a new piece of work, very handsomely made. Drawbaugh made it himself, he told me.

Q. Q. 71. Was it an electric clock or not?

A. Yes, sir; he told me so.

Q. Q. 72. Do you recollect a clock there that had a dial with a moon in the face of it?

A. Yes, sir; it was, I think, one of these old-fashioned clocks—eight-day clocks.

Q. Q. 73. Was that there when you first went there?

A. I think it was.

Q. Q. 74. At the time you saw the two clocks, the second clock, as I understand you, was not in a case. Am I correct in that?

A. I don't remember of seeing more than one case; that of the large clock.

Q. Q. 75. At the time when you saw the four clocks there, were they in cases or not?

A. I don't remember of seeing more than the one in the case.

Q. Q. 76. Do you know whether they were not clock works that had been brought there for Mr. Drawbaugh to repair?

A. He told me he made them.

Q. Q. 77. Were they running, any of them?

A. I am sure that there were two running when I was there.

Q. Q. 78. Did they run by weights?

A. No, sir.

Q. Q. 79. By springs?

A. No, sir. They run by a wire he called an electric wire. I don't know where he had that attached to; he had one end attached to the clock.

Q. Q. 80. Were these clocks that were running sitting on his work-bench?

A. They were fastened up against the partition.

Re-cross by Mr. Storrow:

Re-cross-Q. 81. You have described these two rooms that you saw these two instruments in. Suppose a person were talking in one and another person listening in the other, without the aid of these machines, was there anything except a single board partition to prevent the sound passing from one room to the other?

A. There would be a double board partition between them; that is two inch board partitions, with an intervening room between the partitions.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 3d day of May, 1881.
FRED. M. OTT,
Examiner.

DAVID B. CARL.

Adjourned until 2.15 o'clock, P. M.

JACOB E. SMITH, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. Thirty-five years; residence, near Dillsburg, York county, Pennsylvania; occupation, laboring.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pa.; and, if so, how long have you known him?

A. I do, since 1870; maybe a little longer than that.

Q. 3. Did you, at one time, go to his shop at Eberly's Mills, to see his talking-machine?

A Yes, sir.

Q. 4. How happened you to go there at that time?

A. Curiosity prompted me to go there. I didn't believe that there was a machine could be made to talk from one place to another.

Q. 5. Who excited your curiosity about it?

A. Mr. Cyrus Orris and others talking about it.

Q. 6. How did you happen to hear Cyrus Orris and others talking about it at that time?

A. We were talking about Daniel Drawbaugh being a very smart man, inventing machinery of all kinds, and a talking-machine.

Q. 7. Where was this talk about Drawbaugh—where were you?

A. We were at Mr. Orris' house.

Q. 8. Where did Mr. Orris live?

A. At Etter & Shanklin's mill, about a quarter of a mile from Drawbaugh's shop.

Q. 9. Where were you living at that time?

A. Dillsburg, York county, Penna.

Q. 10. How happened you to be at Mr. Orris' house at that time?

A. I was married there.

Q. 11. Did you marry Mr. Orris' daughter?

A. No, sir; a step-daughter.

Q. 12. What was the date of your marriage?

A. March 26th, 1871.

Q. 13. How long was your visit at Mr. Orris' house at the time of your marriage?

A. Four or five days, as near as I can tell.

Q. 14. What did you hear Mr. Orris say about the talking-machine that so excited your curiosity to see it?

A. Talking from one apartment of the house to the other, and even further than that.

Q. 15. Did he give you any description of the machine before you saw it?

A. No, sir.

Q. 16. How soon after that conversation with him did you go to see the machine?

A. Within a few days.

Q. 17. Did anybody go with you? If so, who?

A. Mr. Cyrus Orris.

Q. 18. Tell us all about your visit to the shop when you went to see the machine?

A. Mr. Orris and I went there. Mr. Drawbaugh was not at home. A young lady brought the key and let us in the shop; others went in also with us. I don't know them, for my part; am not acquainted with them. Saw the talking-machine, or so-called, and the conversation started about it in the crowd. If I mistake not, it was made mention that any one could hear a man talking in New Cumberland by speaking through this machine.

Q. 19. Did you have any talk through the machine at that time, or hear any, and, if not, why not?

A. No, sir; no person there to operate. One part of the machinery was locked in another room.

Q. 20. Then you only saw a part of the machine at that time?

A. Yes, sir.

Q. 21. Do you see here the part that you saw there then?

A. I do [indicating "B"]. It is not quite as then.

Q. 22. What is the difference between it now and then, as far as you remember?

A. There was an extension here, as near as I can tell [indicating the end of the tin tube farthest from the electro-magnet]. This, [the electro-magnet,] I think, was some larger. It appears to me there was some kind of covering over this here, [indicating the end of the tin tube nearest to the electro magnet.]

Q. 23. Did the machine "B" appear to be connected in any way with the room that was locked? If so, how?

A. By wires stretched or extended, I think, from the machine to the room.

Q. 24. Do you remember the appearance of those wires?

A. As near as I can recollect, they were wires covered with some kind of cloth or thread, or something; I won't say positively what.

Q. 25. While you were there with the crowd looking at the machine, did Mr. Orris tell the party what he had seen or heard of the machine? If so, what did he say?

A. Not as I remember of; conversation was altogether; a whole crowd of us. I couldn't specify what any one particular one said.

Q. 26. Tell us all that you recollect that was said on that occasion.

A. Talking through this machine to persons in other parts of the house, and even further than that. Some one made mention, you could hear it as far as New Cumberland, or maybe further. I believe that is about all I recollect, at the time.

Q. 27. Do you recollect whether or not, at the time, it was said that the voice of the person speaking could be distinctly recognized or not through the machine?

A. Yes, sir; during the visit. I specify no particular time.

Q. 28. Do you mean that visit to the shop, or that visit to Mr. Orris'?

A. During the visit to Mr. Orris'.

Q. 29. Do you remember whether anybody there at the shop, at that time, spoke of having talked through the machine, or heard through it themselves?

A. I won't be positive about that; it most runs in my mind that I did hear some one make mention about hearing them talk from one apartment to the other.

Q. 30. How many persons were present there in the shop, at the time of that visit, to see the machine?

A. I would suppose about a half a dozen, as near as I can tell.

Q. 31. Do you know who the young lady was who brought you the key?

A. I won't be sure; I think it was Drawbaugh's daughter.

Cross-examined by Mr. Storrow:

Cross-Q. 32. When did you next see that instrument "B" after that time?

A. I can't give no dates. Say through the spring or summer of '72. I generally visit about twice a year down there—spring and fall.

Cross-Q. 33. When did you next see it after that?

A. I won't specify no particular time; but at different times.

Cross-Q. 33½. How many times have you seen it?

A. I couldn't give no particular number.

Cross-Q. 34. Have you seen it every year?

A. I might have; and other curiosities drawed my attention, I didn't take particular notice of the machine.

Cross-Q. 35. What other curiosities?

A. The electric clock, so called.

Cross-Q. 36. What others?

A. Different things. I couldn't just specify in particular what; that was one of them.

Cross-Q. 37. When did you last see machine "B"?

A. I couldn't give no particular date of that.

Cross-Q. 38. Have you seen it this year, before to-day?

A. No, sir.

Cross-Q. 39. Did you see it last year?

A. Yes, sir.

Cross-Q. 40. When and where?

A. At 'Squire Clark's, Dillsburg, York county, Pennsylvania.

Cross-Q. 41. When was it, and who was present?

A. In the month of August. Abraham, Jacobs, Carl, and Clark were present.

Cross-Q. 42. Have you ever had any talk with anybody about Drawbaugh's talking-machine?

A. Not more than I have made a statement here to-day; not as I recollect.

Cross-Q. 43. Did he have a good many things that he was inventing and getting up, since you have known him?

A. Not in particular; different things I have heard him talking of.

Cross-Q. 44. What other things do you know of his having manufactured?

A. Fusible plug, a patent nail-feeder, I believe, and other things I have heard of.

Cross-Q. 45. Were the curiosities you saw at his shop things he had invented?

A. Yes, sir.

Cross-Q. 46. He is a good deal of a man to contrive a thing, and then, as quick as he has contrived it, lay it aside and take up something else, isn't he?

A. That is more than I am able to tell.

Cross-Q. 47. You made an affidavit last summer, didn't you?

A. Yes, sir.

Cross-Q. 48. What did they tell you they wanted that affidavit for?

A. I don't know as they told me in particular what.

Cross-Q. 49. How long have you lived at Dillsburg?

A. Since 1865.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 3d day of May, 1881.

FRED. M. OTT,
Examiner.

JACOB E. SMITH.

Adjourned until 9, A. M., 4th inst.

May 4, 1881, 9 *o'clock*, A. M.

Examination resumed, pursuant to adjournment.

Present, Mr. Storrow for complainants, and Mr. Hill and Mr. Jacobs for respondents.

CYRUS ORRIS, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. Forty-nine; Cumberland county, a quarter of a mile below Eberly's Mills, and work in the mill.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pennsylvania, and, if so, how long have you known him?

A. I have known him about twenty-five years.

Q. 3. How long have you resided near Eberly's Mills?

A. Thirteen years last April—1881.

Q. 4. Then you went to reside there in April, 1868?

A. Yes, sir.

Q. 5. Do you know Jacob E. Smith, who has testified here, and is he in any way connected with your family?

A. Yes, sir; he is married to a step-daughter of mine.

Q. 6. Did you hear the testimony that he gave here yesterday?

A. Part of it.

Q. 7. Do you remember anything about taking him to Mr. Drawbaugh's shop to see the talking-machine there?

A. Yes, sir.

Q. 8. Was that before or after his marriage to your step-daughter?

A. After.

Q. 9. How long after?

A. Just a short time—the next day or so after.

Q. 10. Tell us all about that visit to the shop to see the talking-machine.

A. The talk was about Dan being a smart man, and what he had been inventing, and was working at a concern that he said a talking-machine, and he was going to have it in place of a telegraph, to talk from one house to another, in the place of writing or telegraph. He was anxious (Smith) to go up to see it. I told him we would walk up, and Dan was pretty much all the time there. It happened, though, that he was not there; there was a girl there, unlocked the shop, and let us in. We saw the boxes there; we only could get into the one room.

Q. 11. Do you remember what particular machines you saw there at that time? Do you see them on the table?

A. No; I couldn't just say in particular, because I was going back and forward there once and twice a week, still.

Q. 12. At that time, when Mr. Smith and you went to the shop to see the machines, you didn't talk through them, did you?

A. No, sir; nor I didn't hear no talking. He had showed me his boxes before that time, and told me what they were intended for, and they were nothing new to me when I took Mr. Smith there to look at things. I was looking at other things, and I took no particular notice of any of them. The whole talk had been about this machine in that neighborhood. It didn't become anything new to me.

Q. 13 Had you heard the machine talked through before that time?

A. No, sir. I heard other ones saying that he had been talking through it, from the lower part of the house up into the room where he worked in.

Q. 14. When Mr. Drawbaugh, before that time, showed you his boxes and told you what they were intended for, what did he say to you about them? Tell us all that he said, as near as you can remember.

A. That he was going to have it to talk from one house to another, and as far as New Cumberland; and his boxes he would have on his benches there. He still would show me a little how he was fixing it and working at it. That is about all, I guess.

Q. 15. Were you about the shop frequently from that time down to the summer of 1880?

A. I was there the first year pretty often; about twice a week; next I wasn't so often; been going in about four or five times in a month, from that time down to last summer.

Q. 16. During all that time, from 1871 down to 1880, was Drawbaugh still working at his talking-machines, or not?

A. He was, I guess. They were always improved. I could see it in his improvement. I would still ask him what such boxes was intended for, and he would tell me it was for a talking-machine. I didn't ask him many questions. It always appeared to me that he didn't care about being bothered.

Q. 17. Did you ever see these two machines, "F" and "B," now on the table? If so, when did you first see them?

A. I don't like to pick on any of them, for I have seen them all, and what I saw first I can't remember.

Q. 18. Did you ever see this machine "C"? If so, when first?

A. I couldn't tell when I first seen it. I saw, I suppose, every one of them, when he was working at them. Never talked through any of them, nor never marked any particular time I was there.

Q. 18½. Do you recollect seeing this machine "A" there at any time?

A. I have seen such boxes, only at what time I couldn't tell.

Q. 19. These machines, "D" and "E," with the curled magnets, did you ever see them? If so, when?

A. I couldn't say. I saw boxes. You know he would have them on his benches, when I would be coming in; he would be working at them. It may have been this box, [taking up "D,"] or this one, [taking up "E."] I would take them up and look at them—took a view of them, set them back carefully—that is the way I would handle these things—not mark any of them.

Q. 20. Do you know anything about his working in the shop late at night?

A. Yes, sir; I have been at the shop at ten o'clock at night, and he was working, and I saw the light in the shop, many a time, at twelve o'clock and after.

Q. 21. What did you find him working at when you would go into the shop late at night?

A. A couple of times that I was in, I found him working at boxes for his talking-machine. That was the talk all through the neighborhood—the general talk, about him working at night at these boxes—this talking-machine.

Q. 22. Was your dwelling so situated that you could see from it his light in the shop?

A. Yes, sir; from the barn. I could see it from the window and from the porch. In summer, when the leaves were out, I couldn't see it from the house, but I could see it in the winter.

Q. 23. Was the light in his shop, in winter nights, a very frequent occurrence or not?

A. Pretty much every time I would take notice.

Q. 24. Do you recollect seeing lines of wire running from Mr. Drawbaugh's shop out along the creek?

A. Yes, sir.

Q. 25. About when did you last see them there?

A. I can't tell; I saw the wires and box he had fixed up, down along the creek in a big ash stump.

Q. 26. How many times did you see wires extending out from the shop along the creek, or elsewhere?

A. I saw that one wire down twice.

Q. 27. Give us your best recollection as to the time when you last saw it, and how long that was after you first saw wires extending out along the creek.

A. They were close both times I saw it; there was the one wire, and I can't remember rightly how far back to put it, or when it was.

Q. 28. State whether it was several years ago.

A. It was several years back, but I can't tell how many.

Q. 29. Could you recognize the instrument now, that you saw on the stump?

A. I don't think I could.

Q. 30. Look at this instrument, marked "H," and see whether or not you remember that as the instrument?

A. He had it setting up on boards on the stump and a wire run down, and he didn't take the cover off of it to see what he had there. It was shaped something like square. I can't say whether "H" is the instrument or not.

Cross-examined by Mr. Storrow:

Cross-Q. 31. Did you and Mr. Smith go alone to Drawbaugh's shop the day after Smith's marriage, or did anybody else go with you?

A. I can't remember of any one going along.

Cross-Q. 32. Didn't Mr. Condry go with you?

A. Not that I remember; he might have.

Cross-Q. 33. You say, in your testimony, the talk was about Dan being a smart man, and what he had been inventing. What did he ever invent, or what did you ever hear he had invented?

A. I heard different things.

Cross-Q. 34. Name some of them.

A. Faucets, clock, what he called a battering-ram—that he invented. I think there was such talk.

Cross-Q. 35. Wasn't he a man who kept his family pretty well?

A. I wasn't much in the house, but, I suppose, the best he could.

Cross-Q. 36. Wasn't it generally understood that he was able to keep them well?

A. I don't know as it was.

Cross-Q. 37. What years was it when he was working nights on the talking-machine? Was it one year, or all the years from 1871 to 1880?

A. It was pretty much all the years since I live there.

Cross-Q. 38. When did you last see any of these instruments on the table before to-day?

A. I can't tell you.

Cross-Q. 39. Were they shown to you last summer or last autumn?

A. I can't tell you anything about it.

Cross-Q. 40. Why can't you tell me?

A. I can't tell the time for certain.

Cross-Q. 41. Have you seen them at any time within the last year?

A. Yes, sir.

Cross-Q. 42. Who showed them to you then?

A. I saw them here.

Cross-Q. 43. What do you mean by here?

A. I mean this last year.

Cross-Q. 44. Who showed them to you the last time you saw them before to-day?

A. No particular person.

Cross-Q. 45. Where was it that you last saw them before to-day?

A. Last in here, in this room.

Cross-Q. 46. When was that?

A. Yesterday.

Cross-Q. 47. How long before that was it that you had seen them?

A. I can't tell.

Cross-Q. 48. Had you seen them any time within a year before yesterday?

A. Yes, sir; I saw them different times, but I can't tell the times or dates.

Cross-Q. 49. Where have you seen them within a year before yesterday?

A. I can't tell, hardly; I saw them different places.

Cross-Q. 50. Name some one of the places.

A. I saw them at Milltown.

Cross-Q. 51. Name some other.

A. I saw them over here in the office.

Cross-Q. 52. Name some other place.

A. I don't know.

PHONE COMPANY,-1

Cross-Q. 53. Who was present at Milltown when you saw them this last time?

A. Daniel Drawbaugh.

Cross-Q. 54. Who else?

A. I think it was Lee; I am not certain.

Cross-Q. 55. Who else?

A. Mr. Jacobs.

Cross-Q. 56. Did you make an affidavit about them?

A. I told them to the best of my knowledge. I couldn't just think of it at that time.

Cross-Q. 57. Did you sign, and swear or affirm to, a statement at that time?

A. Yes, to the best that I knowed.

Cross-Q. 58. Do you know Winfield Gross?

A. Yes, sir.

Cross-Q. 59. What connection of yours is he?

A. Son-in-law.

Cross-Q. 60. When was he married?

A. I can't tell you.

Cross-Q. 61. Warm weather, or cold weather?

A. It was in the fall, I think.

Cross-Q. 62. You went up to Dan's shop, to see his talking-machine, just after Gross' marriage, didn't you?

A. I don't remember.

Re-direct examination by Mr. Hill:

Q. Q. 63. At the time you made the affidavit for Mr. Jacobs, when Mr. Drawbaugh and Mr. Lee were present, did you tell them about taking Mr. Smith there to see the talking-machine, about the time of his marriage?

[*Objected to by Mr. Storrow as incompetent.*]

A. I could remember of me and him going up; I told them that.

Examination taken, reduced to
writing, and by the witness affirmed
and subscribed to before me this
4th day of May, 1881.
FRED. M. OTT,
Examiner.

his
CYRUS × ORRIS.
mark.

May 4, 1881, 2 *o'clock*, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

JOHN SCHERICH, *being produced and affirmed, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. My age is sixty-nine years and one month; born 1812, the 7th of April. My residence is Mechanicsburg, Cumberland county, Pennsylvania. I was a carpenter, then a farmer, and now am an insurance agent.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pennsylvania? If so, how long have you known him?

A. I have known him since he was a little boy.

Q. 3. Did you at one time reside at Camp Hill, about a mile and a half from Eberly's Mills, Cumberland county, Pennsylvania? If so, when did you move there, and when did you move away from there?

A. I did; I moved there about the first of April, 1873, and moved away about the first of April, 1875.

Q. 4. Before you moved to Camp Hill, were you ever at Daniel Drawbaugh's shop, at Eberly's Mills; and if so, did you see anything there which he called a talking-machine?

A. Yes, sir.

Q. 5. To the best of your recollection, how long was it before you moved to Camp Hill that you first saw the talking-machine?

A. I think it was, as near as I can tell, in 1869—that is about four years before, I guess.

Q. 6. Please look at the instruments marked "B" and "F," and state whether you saw either of them at the time referred to before you moved to Camp Hill.

A. Yes; I saw them, or a set exactly like them.

Q. 7. Did you have any talk with Mr. Drawbaugh about it at the time you first saw it? If so, what was the conversation?

A. He was telling me that it was a talking-machine, he called it, and we were upstairs in the third story of the building, in his shop. He went down into the basement, and I staid up in the shop. He talked down there, and I listened up above, and I heard what he then said; then I went down in the basement where he was; then he showed me this tumbler [indicating "F"] or one just like it, that he was talking into. After that we went up stairs again into his shop. This machine "B" was up there, or one like it, the whole time.

Q. 8. Did you ask him on what principle the machine operated?

A. Yes.

Q. 9. What did he say?

A. He said it was better and handier than the telegraph; that you could just talk through it in place of writing.

Q. 10. State whether you saw these two instruments again after you moved to Camp Hill, and while residing there.

A. I did. I saw those and some other machines. He said he had made an improvement on it.

Q. 11. Did you talk through any of the machines again, while you lived at Camp Hill?

A. Yes.

Q. 12. When you listened at the machine, before and at the time you lived at Camp Hill, could you hear the sound of the voice that was talking in at the other end of the line so as to distinguish whose voice it was?

A. Yes; it was his voice.

Q. 13. Please look at the instrument which I now show you, marked "A," and state whether you ever saw that before. If so, state when you first saw it.

A. I saw it when I lived at Camp Hill; it was at the factory—the shop.

Q. 14. Do you remember what you were doing at the time you saw that instrument marked "A?"

A. Yes; I had some apples, and went there to make cider, and him and I were in the shop at that time a good while by ourselves.

Q. 15. About what time of the year was that?

A. In the fall, about the time for putting away winter apples.

Q. 16. When were you last at Mr. Drawbaugh's shop?

A. That was the last time, to the best of my knowledge, that I was in his shop.

Q. 17. At that time, when you were there making cider, did he talk through the instruments?

A. Yes.

Q. 18. Do you remember whether this instrument, "A," was used at that time for listening at?

A. Yes; or one exactly like it, that I could not tell the difference.

Q. 19. Did you put it to your ear in listening?

A. Yes, sir.

Q. 20. Could you hear through it what was said at the other end of the line?

A. Yes, sir.

Q. 21. Where were you when you listened at it, and where was Mr. Drawbaugh?

A. I was in the shop, and he had went down stairs.

Q. 22. Were you on the upper floor?

A. Yes, on the third floor of the shop.

Q. 23. What floor was he on when you were listening at "A"?

A. He went down again to the basement.

Q. 24. Did you see what instrument he was talking into at that time?

A. Yes, he showed me after I went down.

Q. 25. Do you remember what kind of an instrument it was that he was talking into?

A. It was a kind of a little box that he was talking into. I can't remember the shape of it exactly; it was so long ago.

Q. 26. Was it this instrument "F," or some other instrument?

A. It was different from this. He said it was an improvement from the first one.

Q. 27. Was that in the fall of 1874?

A. Yes.

Q. 28. Look at this box, marked "I," and see whether this looks like the instrument that he spoke into in the fall of 1874.

A. It looks like it.

Cross-examined by Mr. Storrow:

Cross-Q. 29. How many other talking instruments did you ever see at Mr. Drawbaugh's shop?

A. Oh, he had different machines there at that time, but I couldn't tell anything about them. That is all that I seen in use.

Cross-Q. 30. Were the other machines talking-machines?

A. I can't tell that; I don't remember.

Cross-Q. 31. Didn't he tell you what some of the other machines were for?

A. I can't recollect. His mind was taken up pretty much with talking about the talking-machine, but I don't recollect much else.

Cross-Q. 32. Didn't he tell you he had made other talking-machines besides the four instruments you have spoken of?

A. Not that I recollect; only that he was making improvements on it.

Cross-Q. 33. How often did you go to his shop while you lived at Camp Hill?

A. I can't tell whether I was in his shop more than once while I lived at Camp Hill, or not. All I recollect is that we had this up the time I was there making cider.

Cross-Q. 34. Why did you go to his shop to make cider?

A. They had a press in the basement that ground the apples by water.

Cross-Q. 35. Who was present on either of these occasions, when you say you saw these talking-machines?

A. There was no person with us when we were there.

Cross-Q. 36. Have you ever seen Drawbaugh since you left Camp Hill?

A. Oh, yes; I have seen him frequently.

Cross-Q. 37. Where have you seen him?

A. He had moved to Mechanicsburg since that. I have seen him there; met with him different times.

Cross-Q. 38. Do you mean that he moved to Mechanicsburg, or that you did?

A. He lived in Mechanicsburg, I think, one year. I have been living there ever since.

Cross-Q. 39. There is considerable manufacturing and machine-shop work carried on at Mechanicsburg, isn't there?

A. Yes, sir; Haucks had a machine-shop there, manufacturing plows, rakes, and other machines.

Cross-Q. 40. Did you ever see any of the other machines Drawbaugh invented or made, such as his faucet and electric clock?

A. I seen a clock there and a faucet. At one time I had a power of attorney to sell territory for manufacturing faucets under his patent.

Cross-Q. 41. When was that?

A. It was in 1867 or 1868, I can't just mind the date. I sold them faucets around home, too. That took me frequently to their shop to get faucets.

Cross-Q. 42. Was he manufacturing them, then, at his shop?

A. They were manufactured on the second floor.

Cross-Q. 43. Did you ever see an electric clock of his?

A. I saw that several times that I was there.

Cross-Q. 44. When did you see any of them?

A. The time I was there getting faucets, still. I was up different times that I saw it. The day that I saw this [indicating "F"] there were no hands at work in the shop.

Cross-Q. 45. In what year was it that you first saw the electric clock at his place?

A. That I can't tell.

Cross-Q. 46. Was it before you went to Camp Hill, or after?

A. Oh, I seen the clock before I went to Camp Hill; I think so.

Cross-Q. 47. What did the clock look like? How big was it?

A. That I can't exactly tell; it appears to me it was like those old-fashioned eight-day clocks.

Cross-Q. 48. Have you ever done any insurance business with Drawbaugh?

A. I never took any insurance that I know of. I wanted to take his insurance, and he said he wasn't able. I once filled out an application for him at his home, and when he came in I wanted him to attend to it; he said he would as soon as he was able. That is several years ago; he said he was too poor, he couldn't afford it.

Cross-Q. 49. Where was his home then?

A. At Milltown, near the blacksmith shop.

Cross-Q. 50. Why did you go to his house then and not to the shop?

A. The house was close to the blacksmith shop. I staid at his house 'till he came from dinner and took dinner with him. I had been at the blacksmith shop to get a horse shod.

Cross-Q. 51. About how many times have you been at Eberly's Mills since you moved away from Camp Hill?

A. I wasn't there very often. I was there a few times that I was in the mill, and they had a little store that I was in several times, and then I was at the blacksmith shop several times. I got Fettrow to shoe my horse; my horse cuts himself, and I thought he could shoe him better than any one else. That is one reason that I stopped at that shop.

Cross-Q. 52. Are you quite sure that you didn't go to Drawbaugh's shop any of these times?

A. To the best of my knowledge, I wasn't in his shop since the time I made the cider; not that I can recollect of.

Cross-Q. 53. In your 48th answer, you say that he told you he would take a policy as soon as he was able; I suppose he has never been able, up to this day, has he?

A. I expect not; for he has never called on me. I left the application, so that he could call on a doctor and be examined; and that was the last I heard of it.

Cross-Q. 54. Have you ever spoken to him about any insurance since then?

A. I asked him when he came to Mechanicsburg. I told him, "Now, I suppose you are ready to take out a policy?" He said, "Not yet." I don't recollect anything else.

Cross-Q. 55. When was that?

A. Directly after he moved to Mechanicsburg. That is several years ago.

Cross-Q. 56. Have not said anything to him about it since this telephone business came up, have you?

A. Not that I recollect of.

Cross-Q. 57. Have you talked with him about telephones this last year?

A. Yes, sir. The way I came to talk to him—they have one in the Presbyterian church for the benefit of Dr. Young. When I seen it I just wondered whether it was like the one Drawbaugh had to talk through, and intended to go down to see it. So, one day, I was just taking water from the hydrant to water my horse; Drawbaugh opened the gate, came into the yard, and he asked where Seifert lived. I told him the next house. He turned around and I called to him: "Hold on here, I want to see you." He said he hadn't time, he was in a great hurry. I told him that I was in a hurry, too, but that I wanted to see him particularly; that I was in the Presbyterian church and seen a talking-machine there, and I wanted to know whether it was like his. He asked me then when I seen his machine. I told him that I saw it in the shop there. He said he had forgotten it, he didn't mind of me being there. He wouldn't tell me anything. He said his lawyer was up town and he wanted me to go with him and tell what I knew about it. I went with him. I didn't know he had any lawyer in town, or anything about it at the time. I went up and I met the young man there. He asked me whether I had seen those machines. I told him I had seen them years back, but I hadn't given it any attention until I seen that machine there; that drawed up my memory again.

Cross-Q. 58. Did you make an affidavit at that time?

A. No, sir; after that he came there and I made affidavit before Shelly, notary public.

Re-direct examination by Mr. Hill:

Q. Q. 59. The faucets were manufactured by a company about 1868 or 1869, were they not?

A. Yes, sir; before that, I think.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to this 4th day of May, 1881, before me.

FRED. M. OTT,
Examiner.

JOHN SCHERICH.

HENRY C. SPRINGER, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. My age is fifty-two, on the fifteenth of April; my residence is Andersontown, York county, Pennsylvania; occupation, a shoemaker.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pennsylvania? If so, how long have you known him?

A. I have known him about eight years.

Q. 3. Did you at one time reside at Eberly's Mills? If so, when did you commence to reside there and when did you move away?

A. I commenced there April 1st, 1876, and moved away about the sixth or seventh of January, 1877. I just rented a shop, and went there to work, boarded myself and lived there; my family stayed at Andersontown.

Q. 4. While so living at Eberly's Mills, did you, or not, frequently visit the shop of Daniel Drawbaugh?

A. Yes, sir; about twice a day, noon and evening.

Q. 5. During that time did you see there what he called a talking-machine?

A. Yes, sir; that is what caused me to go down there pretty much every time I went.

Q. 6. Did you go down to assist him about talking on it, or operating it?

A. He boarded with his brother, just above me, and he stopped,

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still, after dinner, and I said. "I will go along down, and we will talk through that machine," I told him it was a curiosity to me. I wanted to talk with him through it.

Q. 7. During the time that you lived there, as you have stated, did you see more than one talking-machine? If so, how many, to the best of your recollection?

A. I saw these six that lays here [indicating "B," "F," "D," "E," "G," and "O;"] these two are the first we talked through [indicating "B" and "F."]

[*Examiner notes that instruments "A," "C," and "I" are also on the table.*]

Q. 8. How soon after you talked through "B" and "F" did you talk through any of these other four, "D," "E," "G," and "O?"

A. It was about two months, as near as I can tell you, that he had these two, "D" and "E," or two exactly like them. He told me then that he had improved the machine; that he could talk both ways then. Then I went along down. The first we had we could only use to talk in one direction.

Q. 9. Referring to these two instruments, "B" and "F," which did he talk into and which did you listen at?

A. He talked into the glass tumbler "F," and I listened at the tin box "B."

Q. 10. Where were the two machines "F" and "B" when you were talking and listening?

A. "F" was in the second floor, in a little office that he had made partitioned off. "B" was on the back part of the machine-shop on the same floor.

Q. 11. Were they connected in any way? If so, how?

A. There was a fine wire ran through from one to the other.

Q. 12. Do you remember whether they were connected by one or two wires?

A. I think there was two wires; I think one went up, up-stairs like, and came down, and one went straight.

Q. 13. Were the wires wrapped or covered with anything?

A. Yes, I think they were covered with thread or silk, or something of that kind.

Q. 14. Do you remember what was the condition of the end of the tin box next to the electro-magnets?

A. Yes, sir; I think he had cut a piece out of a drum head and fastened it over the end of the tin box.

Q. 15. Did you remember whether there was anything attached to the piece of skin or drum head?

A. Yes, sir; he had a little bar of iron across, or steel, or something.

Q. 16. When he talked to you through these machines "B" and "F," did you understand what he said?

A. Yes, sir; quite distinctly.

Q. 17. Did you recognize his voice, so as to distinguish it from other persons' voices through the machine?

A. Yes, sir.

Q. 18. Do you remember how he came to show you these two machines, "D" and "E?"

A. He told me he had improved the talking-machine, and showed me these.

Q. 19. How came he to tell you that at that time?

A. He told me he had got the machine that we could talk both ways—I to him, and him to me.

Q. 20. Did you ask him first if he could talk both ways, and was this his reply? or was this his statement without any question?

A. He came down from dinner and stopped at my shop, and told me if I would go along down, now, we could talk to each other.

Q. 21. And when you went down, you talked through those machines "D" and "E," did you?

A. Yes, sir.

Q. 22. Was that the first time you had seen the machines "D" and "E?"

A. Yes, sir.

Q. 23. Do you remember any of the conversation that you had through those machines "D" and "E" at that time?

A. He asked me how I liked living in "bachelor's hall." I told him not very well.

Q. 24. After you had talked through the machines "D" and "E," did you again afterwards talk through "B" and "F"?

A. No, sir.

Q. 25. When did you see these two machines "G" and "O"?

A. About some time in October, 1876.

Q. 26. Did you talk through those machines "G" and ""O"?

A. Yes, sir.

Q. 27. Did you hear and understand what was said through those machines?

A. Yes, sir.

Q. 28. Do you remember whether or not you saw him making these two machines "G" and "O?"

A. No, sir; I did not see him making them.

Q. 29. Nor the others, "D" and "E?"

A. No, sir.

Q. 30. Did you, at any time when there, see this machine "C?"

A. I saw this in the office there; a little office he had.

Q. 31. When you first went there?

A. It was three or four weeks after I went there.

Q. 32. Do you remember seeing this box "I" there at any time?

A. No, sir; I don't recollect of seeing it.

Q. 33. Do you recollect of seeing this machine "A" there at any time?

A. No, sir; he must have got that after I left. I don't mind of seeing it.

Q. 34. Did you see him making any talking-machines while you were there, or working on them?

A. No, sir; I never got there only at dinner time, and in the evening when he quit work.

Q. 35. You have referred to seven machines in all as seen by you at that time—are these all the talking-machines that you saw there, or were there others?

A. These are all, to my recollection.

Q. 36. You gave us certain conversation that you had through the machines with Mr. Drawbaugh. Do you recollect any other conversations, or parts of conversation, that you had with Mr. Drawbaugh through the machines? If so, give them.

A. One Saturday afternoon he asked whether I was going down to Bridgeport. I told him, through the machine, that I was going, and asked him whether he would go along. He said—answered back—he would, and I says to him, "Suppose we go out to the pike to Kellers';" Kellers lived out at the pike. He answered back that he didn't know them. I told him, then I would make him acquainted. We talked a good little bit, that Saturday afternoon, back and forward. I can't recollect all that we said.

Q. 37. Did you ever whisper through the machine?

A. Yes, sir: talked low.

Q. 38. In all these conversations, were the machines in the places that you spoke of?

A. Yes, sir.

Q. 39. Any doors between them?

A. A board partition between them. He had a door in as you came up the steps, but the wires went through the partition.

Q. 40. In any of your conversations with Mr. Drawbaugh at that time, was anything said about getting a patent on the talking-machine?

A. Yes, sir; he said he would get it patented, but he was too poor; he couldn't afford it. There was several of us in the shop there, talking that his family were so opposed to him working on it, because it would never do him any good. That was the general talk there at that time.

Q. 41. Do you mean in his shop or in yours?

A. In my shop.

Q. 42. Who of his family opposed him about it—his wife?

A. Yes, sir, his wife; the way I can understand.

Q. 43. Do you mean that is the way you understood at the time?

A. Yes, sir.

Q. 44. Do you know anything about his poverty at that time?

A. Yes, sir; I done some shoemaking for him, and he hadn't money to pay me still. He did pay me before I left, but he hadn't money to pay me along, as I done it.

Q. 45. How large were your bills for shoemaking for him?

A. The highest bill he got done at one time, to the best of my recollection, was about eighty cents.

Adjourned until half past nine o'clock, A. M., May 5.

May 5, 1881, 9.30, *A. M.*

Examination of Mr. Springer resumed.

Same counsel present.

Examined by Mr. Hill:

Q. 46. You said yesterday that Mr. Drawbaugh spoke of patenting the machine if he was able, or if he had the means. Do you remember whether he spoke of this once or more than once? If the latter, how often?

A. About a half a dozen times.

Q. 47. Do you recollect whether he said anything about getting somebody else to go in with him to furnish the means?

A. Yes, sir; he told me if he just knowed who he could get, he would get him and go in with him.

Q. 48. Do you recollect whether he said anything about the value of the invention?

A. He said it would be a fortune to him and make him independent.

Q. 49. Do you recollect whether he compared it with telegraphing? If so, what he said?

A. He said it would far exceed telegraphing.

Q. 50. Do you remember whether, when he was speaking about his being so poor, he said anything about being heavily in debt at the time?

A. He said he was paying a heavy rent in Mechanicsburg, and he was losing by it, and was not making enough to meet his ends.

Q. 51. Do you remember what business was carried on in the building where Drawbaugh's shop was, at the time you were living in that neighborhood?

A. The main business was, while I was there, making iron axles for buggies.

Q. 52. Who was connected with that axle business, so far as you remember?

A. The time I was there, Jacob Kline and Bowman, a son-in-law of Kline, who lived at Camp Hill. Drawbaugh worked for them.

Q. 53. While you were at Drawbaugh's shop, at any time, did you see him exhibit his talking-machine to anybody besides yourself? If so, to whom?

A. No, sir. I went down about fifteen minutes at dinner time, and in the evening. There was no one in but him and I.

Q. 54. When you would go down in the evening, about what time would you generally go—right after supper or later?

A. Went down about dark and stayed there until about bed-time—talked there together.

Q. 55. How many times during that year did you stay there during the evening, to the best of your recollection?

A His family was in Mechanicsburg, and mine in Siddonsburg, and I would go down there pretty much every evening, and we were together pretty much all the time, outside of regular working hours.

Q. 56. Did you see an electric clock in his shop at that time?

A. Yes, sir; I did.

Q. 57. Was he doing anything at that?

A. Not at that time I was there. He had it running before I came there, and all the time I was there.

Q. 58. So far as you could see and know, during the time you were there, what was Mr. Drawbaugh principally giving his attention to?

A. His whole mind appeared to be on this talking-machine. He told me that many a night he didn't sleep, just studying how to improve it.

Q. 59. Were you ever in the shop before you went to Eberly's Mills to live?

A. I had business here in Harrisburg, in 1875. I had heard of his machine-shop—this talking machine of his—and I stopped in to see.

Q. 60. Did you then see any talking-machines?

A. He was busy at work. He told me that he had had it; that I should come down some other time, and he would operate them, So I didn't get down until the next spring, when I rented the shop, when I took my things down and commenced work, and then we would talk through it.

Q. 61. After you moved away from there, were you ever in the shop, or not?

A. No, sir; I have not been there since.

Q. 62. At the time when you were about the shop so much, where did he keep the machines? Were they always attached to the wires, or were different ones attached to the wires, and, when not in use, were they on the bench, or in a cupboard, or where?

[*Objected to by Mr. Storrow as leading.*]

A. He had a wooden box under a table that he had them in. He had these two ["B" and "F"] attached to the wires pretty much all the time, and he would change them and put other ones on when he wanted to talk.

Q. 63. These two instruments, "D" and "E," do you remember whether they both had the bottom covered at that time, or were they as now, one covered, and the other uncovered?

A. As near as I can recollect, they were just as they are now, the one was covered, and the other was not.

Q. 64. Do you remember their appearance when you first saw them, and if so, did they look as if they had just been made, or as if they had been made some time?

A. They looked about as old as they do now; as if they had been made a long while. I am satisfied they were not made new.

Q. 65. Do you remember how far the instruments were apart, when you talked and listened through them?

A. They were the whole length of the building, and through a partition. I suppose the building is sixty feet long; may be more. We put them as far apart as the building would allow.

Q. 66. Did he tell you at that time how far he could talk through them? If so, what did he say?

A. He said it could be made to talk across the ocean.

Cross-examined by Mr. Storrow:

Cross-Q. 67. Where did you move to when you left Eberly's Mills?

A. I built a house and moved to Andersontown, where I live now.

Cross-Q. 68. Have you lived there ever since?

A. Yes, sir.

Cross-Q. 69. You say that when you used the instruments they were somewhere about sixty feet apart. Were they both on the same story?

A. Yes, sir; they were both on the same story.

Cross-Q. 70. How many partitions between them?

A. One board partition.

Cross-Q. 71. Please describe how that story was partitioned off.

A. At the time I was there, a stairway went up to the second story, on the outside, on the north-west side, away from the creek, facing the hill as you go down the road. As you got up the steps, there was a platform some five feet square outside. There was a door opened into the second floor, as you came up, at the right hand. As soon as you got in, a door opened at the left into his office, at the north corner. It was an office partitioned off square, and he had "F" in it, and the wire ran through the partition and out to the back part of the building along the wall to the further end of the building. The balance of the room he had his works in—belts, and so on.

Cross-Q. 72. Then, if I understand you, that story had his little office room partitioned off in one corner, and all the rest of it was one room together. Was that it?

A. At the time I was there, it was.

Cross-Q. 73. What work was being carried on in the room in the second story?

A. Making these iron buggy axles.

Cross-Q. 74. Did this office run across the whole of one end of the building, or was it just in one corner?

A. About ten feet square, as near as I can tell you, in the north corner.

Cross-Q. 75. What else did he have in his office, besides the talking-machines that you spoke of?

A. All that I noticed was the electric clock, and those instruments, and the desk and table. He kept their books in the desk.

Cross-Q. 76. How many doors were there to the office?

A. One door to the office.

Cross-Q. 77. On which side?

A. On the east side, I guess you would call it; the corner next to where you enter the building.

Cross-Q. 78. Did he have a cupboard there to keep his things in?

A. He had a wooden box that he kept these instruments in, and desk that he kept his books in; no cupboard in it.

Cross-Q. 79. Where was the box kept?

A. He kept the box under a table that he had there.

Cross-Q. 80. Are these seven instruments that you have testified about in the same condition now that they were in when you lived at Eberly's Mills?

A. All as near as I can tell, only that piece is off of that one [indicating "G"] and the drum-head is not on that one, [indicating "B"] and some of the stuff has dropped out [plaster-of-Paris] of "B" and "F."

Cross-Q. 81. How often have you seen those instruments since you left Eberly's Mills, and before yesterday?

A. I didn't see them at all since; yesterday was the first.

Cross-Q. 82 I suppose you have talked with Drawbaugh, or somebody, about giving testimony in this case, before yesterday, haven't you?

A. Not that I can recollect. I don't think I seen Drawbaugh since, until yesterday.

Cross-Q. 83. Were you subpœnaed to come here and testify?

A. Yes, sir; very unexpected yesterday morning, by Constable Shank. I didn't get time to put on other clothes.

Cross-Q. 84. So you didn't know until yesterday morning that you were going to be wanted as a witness, didn't you?

A. No, sir; indeed, I did not.

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Cross-Q. 85. Where did Drawbaugh live while you worked at Eberly's Mills?

A. His family lived at Mechanicsburg, and he boarded at his brother John's, at Eberly's Mills.

Cross-Q. 86. Whereabouts in Mechanicsburg did his family live?

A. That I cannot tell you exactly.

Re-direct examination by Mr. Hill:

Q. Q. 87. Do you recollect whether this machine "F" had any drum-head about it?

A. It seems to me it had something like it inside. It was shut with something inside. It had someting like drum-head in it.

Re-cross by Mr. Storrow:

Re-Cross-Q. 88. Did you examine the inside of these instruments while you were at Eberly's Mills so as to know how their insides were made? I refer to the whole seven.

A. It was a curiosity to me. I examined these two, "B" and "F," and I seen they were shut with something like drum-head; the others I didn't examine as much as these two.

Re-direct by Mr. Hill:

Q. Q. 89. Do you remember whether the bottom of tumbler "F" was broken then as it is now?

A. Yes, sir; I think it was. I think it was in the same shape it is now.

Re-re-cross by Mr. Storrow:

Re-re-cross-Q. 90. Are you sure whether it was broken off or not?

A. Yes, sir; I am pretty positive that it was in the same shape that it is now.

Examination taken, reduced to
writing, and by the witness affirmed
and subscribed to this 5th day of
May, 1881, before me,
FRED. M. OTT.
Examiner.

HENRY C. SPRINGER.

DANIEL BALSLEY, *being produced, sworn, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. Forty-nine, on the fifth of last February; reside at New Cumberland, Cumberland county, Pennsylvania; am a wheelwright or wagon-maker.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pennsylvania? If so, how long have you known him?

A. I have known him for thirty-five years.

Q. 3. Did you ever visit his shop, at Eberly's Mills, after the year 1870?

A. I did.

Q. 4. How many times?

A. Once.

Q. 5. When was that, as near as you can fix it?

A. In the year 1872, I think; may be a little before or after, won't be positive.

Q. 6. Where were you working or doing business at the time you visited his shop?

A. In my own shop at New Cumberland.

Q. 7. When did you commence to carry on business in your own shop at New Cumberland?

A. In 1871.

Q. 8. Do you think it was before or after the year 1874 that you visited his shop?

A. It was before 1874.

Q. 9. At the time you visited his shop, do you remember seeing the old saw-mill that formerly stood near the shop?

A. Yes, sir; it was in a dilapidated condition—nearly all gone.

Q. 10. Do you remember how you happened to go to Mr. Drawbaugh's shop on that occasion? If so, state.

A. I was foreman—carpenter, under master-mechanic John Horton, of Lochiel Iron Works. He asked me if I knew Daniel Drawbaugh. He asked me if I would go with him there, if he [Horton] would come to my place, he having left Lochiel, and gone to Wheatland, I forget what county, and returned. Then he and I went to Milltown.

Q. 11. Am I to understand you that Horton had formerly been master-mechanic at the Lochiel Iron Works?

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A. Yes, sir; from 1865 to 1870.

Q. 12. And it was after he left there that this visit was made to Drawbaugh's shop?

A. Yes, sir; he came to see his family, who remained at Lochiel.

Q. 13. And was it after you had ceased to work for the Lochiel Iron Company?

A. Yes, sir.

Q. 14. Do you know why Horton wanted to go to see Drawbaugh?

A. He said he heard a great deal of him in Philadelphia. He (Horton) was from there.

Q. 15. State what took place when you and Mr. Horton arrived at Mr. Drawbaugh's shop.

A. I introduced Mr. Drawbaugh to Mr. Horton as former master-mechanic of Lochiel. Mr. Drawbaugh's face flushed up and he seemed glad to see him. After a little conversation with Mr. Horton, he says to me, Drawbaugh said: "Uncle Dan, I am working at something now, if I accomplish it will be worth thousands to me;" and then he produced a tin can. I think it was attached to a board—I think, with two pieces of strap-iron; and a tumbler glazed with plaster. The bottom was out of the glass. If I am not mistaken, I have not seen it since. He says, "By attaching two wires, you can hear it away off; the telegraph is nowhere with it." I replied to him, "If that be the case, don't let it slip like the 'Gifford Injector;' put it through at once." He replied, "I have not the means at the present time." Then he began to explain to me about it, and mentioned talking-machine, he was making. He got too deep for me, and I made up my mind he was out of his mind. I paid very little attention to it. Then I left his shop and went out to the saw-mill, and left Mr. Horton with Mr. Drawbaugh.

Q. 16. Do you recollect whether, during that interview, Mr. Drawbaugh said anything about getting others to help him—to furnish means, and take an interest in the invention? If so, what?

A. He said that if he had some person to help him they could make a nice thing of it very soon.

Q. 17. Do you remember whether he said anything about having tried to get others to help him, or not?

A. He asked his best friends, he said, and they all refused him.

Q. 18. Did you, at that time, have the means to take hold of the invention?

A. I could have helped him, but I would not have on that, because I did not understand it.

Q. 19. Is Mr. Horton now living or dead?

A. He died at Johnstown Iron Works several years ago.

Q. 20. Please look at the machines "B" and "F" now shown you, and state whether you have ever seen them before. If so, when?

A. I think I saw them two, and am most positive they are the only ones I saw at that time.

Q. 21. Did you hear any talking through them at that time?

A. No, sir.

Q. 22. Some time last fall, you made an affidavit for Mr. Jacobs or Mr. Drawbaugh about this matter, didn't you?

A. Yes, sir.

Q. 23. At the time you made the affidavit, did they show you the machines "F" and "B?"

A. They showed me two, and I think those are the two that Mr. Drawbaugh showed me; I think these are the ones.

Q. 24. Did they also show you other machines at that time?

A. I saw no other.

Q. 25. Did they show the machines before you had told them what you knew or after?

[*Objected to by Mr. Storrow as incompetent.*]

A. I stated first, and they drew them out.

Q. 26. State whether or not you have ever seen those machines between the time when you saw them at Mr. Drawbaugh's shop and the time when you saw them here lying on the table during this deposition, except the time when they took your affidavit.

A. I never saw them from the time I first saw them until the time they took my affidavit at the 'Squire's office, and I never saw them from that time till now.

Q. 27. Do you know anything about Mr. Drawbaugh's financial condition about the time you were there at his shop? If so, what was it?

A. He told me that if he had the means he would put this through very quick, besides some other things he would like to have, but he had not the means—was not able.

Q. 28. Did you know anything about his financial condition along in those years, besides what he told you at that time?

A. I did. He had some very good patents sold and intrusted to various individuals, and he lost all that he had made, and left him just where he had started, and I guess a little lower.

Q. 29. Was he a steady, hard-working man?

A. He was a very industrious, sober, hard-working man from the time he was thirteen years old to the present time. He made a rifle for me when he was thirteen years old.

Q 30. Do you know what is his general reputation in the community where he lives for truthfulness and honesty?

A. I believe he is truthful and honest; that is his reputation in the community where I live and where he lives. I live four miles away from him.

Q. 31. He is a good mechanic, is he not?

A. Yes, sir; in wood particularly; he can make anything.

Q. 32. Do you know why, being a good mechanic, he did not keep himself in funds by working as a mechanic?

A. He was generally working on patents, and all the money he could raise he took for that, and it left him in very penurious circumstances.

Adjournment for dinner, until 2, P. M. [Mr. Abraham came in during the examination.]

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2 *o'clock, P. M.*

Examination resumed, pursuant to adjournment.

Present same counsel, with the addition of Mr. Abraham for respondents.

Cross examined by Mr. Storrow:

Cross-Q. 33. Have you ever been at Drawbaugh's shop since the visit you have described?

A. No, never.

Cross-Q. 34. In your fifteenth answer, you say that you told Drawbaugh not to let it slip like the "Gifford Injector." What do you refer to by that?

A. An injector that he had partly done, and some person had got it patented before he got to Washington.

Cross-Q. 35. Is that the injector that Sellers & Co. make in Philadelphia?

A. That I can't tell. I have been told by Criswell, the machinist at the mill, that that was the patent Drawbaugh was working at. I talked with Dan about it, too.

[*Mr. Hill objects to the statements of Mr. Criswell as hearsay, and as irrelevant and immaterial.*]

Cross-Q. 36. What talk did you have with Dan about the injector?

A. I never had no talk with him about it, only to ask him that question, as I stated before.

Cross-Q. 37. Did you ever know of any other inventions that Drawbaugh made, or claimed to have made, besides the ones you have mentioned?

A. Yes, sir; a stave-cutter, a stave-jointer, and nail-feeding machine and cutter, that I know and saw. He made a great many others that I never saw.

Cross-Q. 38. Tell me the others which you have heard of but have not seen.

A. He made a very nice tack-machine, to cut carpet tacks, a grand machine. I saw that, but I paid very little attention. I can't name the other machines that I heard of—different machines, I am told by the neighbors, that he is working on, but I never went to see them, for I cared very little about it.

Cross-Q. 39. Wasn't it rather curious that Mr. Horton should come and ask you if you knew Dan Drawbaugh, and ask you to go up and see him, when you had known him for twenty-five years?

A. Nothing curious about that. I was under Mr. Horton's control at Lochiel. I was living in Cumberland county. He was living at Dauphin. He was my superior at Lochiel. I often talked about it.

Cross-Q. 40. Talked about what?

A. About Drawbaugh.

Cross-Q. 41. You mean you had often talked about Drawbaugh with Mr. Horton before that?

A. Oftentimes.

Cross-Q. 42. What kind of talk had you had with Mr. Horton about Mr. Drawbaugh before that?

A. Of being a natural genius. I served apprenticeship the seven years and he never served any at all, and can make as good a wagon as I can.

Cross-Q. 43. Then, I understand, you had often talked with Horton about Drawbaugh and about his being a natural genius; did you ever

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talk with him about the things Drawbaugh's ingenuity had enabled him to do?

A. I told him anything he wished to make out of wood he would make it and no trouble. Then he said, "I would like to see the man," and he did see him.

Cross-Q. 44. Were you employed under Mr. Horton at the time of this visit to Drawbaugh's?

A. No, sir.

Cross-Q. 45. Was Mr. Horton master-mechanic at the Lochiel Works at the time of his visit, or what was he doing?

A. He was master mechanic of the Johnstown mill, and was on a visit to see his wife.

Re-direct by Mr. Hill:

Q. Q. 46. In your tenth answer, you speak of Horton having left Lochiel, and gone to Wheatland; and, in your forty-fifth answer, you speak of his being master-mechanic at the Johnstown mill, at the time of your visit. Please explain about his being at Wheatland, and at Johnstown.

A. When he left Lochiel, he went to Wheatland to a mill owned by Woods & Co. They failed, and at the time of his visit he was at Johnstown, where he died. He told me he was at Johnstown.

Q. Q. 47. In your fourteenth answer, you stated that Mr. Horton wanted to go to see Drawbaugh, because he had heard a great deal about him in Philadelphia. When did he tell you that he had heard a great deal about him in Philadelphia?

A. Prior to going to Wheatland. He was going to go before, but never got over until he came back.

Q. Q. 48. Going to see Drawbaugh?

A. We often talked about it before he went away. He talked of going to see Drawbaugh.

Q. Q. 49. Was it when you were telling him of Drawbaugh's genius that he told you he had heard about him in Philadelphia?

A. He told me about him often. Then, he at the time asked me if I knew him. I told him that I did, personally.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me this 5th day of May, 1881.
FRED. M. OTT,
Examiner.

DANIEL BALSLEY.

ELIAS Z. GOOD, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. Forty-nine, almost. I live in York county, New Cumberland is my post office; I live at New Market. I am making post and rail fences now. My regular trade used to be milling in old times.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pennsylvania? If so, how long have you know him?

A. I know him, and have known him for a good many years, since 1852, the time I commenced working there in the mill.

Q. 3. In what mill?

A. Eberly's mills.

Q. 4. Did you live at Eberly's Mills then?

A. I hired there. I boarded there, single.

Q. 5. When did you move away from Eberly's Mills?

A. April, 1872.

Q. 6. Where did you move to from there?

A. Right across from New Cumberland about fifty yards from the creek, in Ross' house in York county.

Q. 7. How long did you live in Ross' house?

A. About twenty-two days less than four years. I moved a couple of days before the first of April, 1876.

Q. 8. Where did you move to?

A. To New Market, to my farm, which adjoins Ross'.

Q. 9. You have lived at New Market ever since, have you?

A. Yes, sir; in the same house.

Q. 10. While you lived at Eberly's Mills, were you ever in Daniel Drawbaugh's shop there?

A. Yes, sir.

Q. 11. Did you ever see any talking-machines in Drawbaugh's shop while you lived at Eberly's Mills?

A. Yes, sir; I saw what he called a talking-machine. That is it—just as natural as it was to-day [taking up "F" and "B"]. This is what I remember—this glazing inside the tumbler.

Q. 12. Did you talk through the machines or hear anybody talk through them at that time?

A. No, I did not.

Q. 13. Who showed them to you?

A. Dan Drawbaugh.

Q. 14. After you moved away from there, were you ever back at the shop?

A. Yes, sir.

Q. 15. How many times do you think you were back in the shop after you moved away?

A. Seven or eight times; I can't tell you exactly; seven times anyhow, may be oftener.

Q. 16. What did you go back for after you moved away?

A. For a little bit of money.

Q. 17. From whom?

A. Daniel Drawbaugh.

Q. 18. Was he owing you money when you moved away?

A. Yes, sir.

Q. 19. How much?

A. I think it was five dollars and some cents left due when I moved away. He paid me some on the day I left; I don't mind just exactly.

Q. 20. Has he paid the balance of it?

A. A couple of years after that he paid me part. The balance he paid me this last winter.

Q. 21. Do you know why he didn't pay you before?

A. Because he hadn't the money.

Q. 22. When you were there on any of those dunning visits, after you moved away from Eberly's Mills, did you ever see the talking-machines again?

A. I seen this machine, ["B," and "F"].

Q. 23. Did you ever see any other besides this?

A. I can't say as I did.

Q. 24. Was anybody operating the talking-machines at the time you saw them on your dunning visit?

A. Dan was in the room operating; that is what George told me. I was in another room with George, talking to him. George told me that Dan was operating on the instrument, the talking-machine. That is what George told me.

Q. 25. How long was that after you moved away from Eberly's Mills?

A. I think it was the second year after I left there. I was there on a fishing expedition, along the Yellow Breeches.

Q. 26. George was Dan's brother, was he not?

A. No, sir; Dan was his uncle.

Q. 27. Was George listening at the machine when he said Dan was operating it?

A. I can't tell you that. He was close by it.

Q. 28. Do you remember whether this tin tube "B" was open straight through at the time you saw it, or whether the end of it was closed?

A. It was closed—one end, anyhow.

Q. 29. Have you any recollection what it was closed with?

A. I can't say whether it was bladder or drum-head, or what it was closed with. It was something white and fine.

Q. 30. Do you remember whether the bottom end of this tumbler "F" was broken off when you saw it?

A. I can't say about that right, how that was. It is so long ago that I don't remember that.

Q. 31. Did you have any talk with Dan about it the second time you saw it? I mean the time George was there.

A. No more than he said that he was improving his talking-machine.

Q. 32. At either that time or the first time that you saw it, did Mr. Drawbaugh tell you anything how far about he could talk through it and be heard?

A. I don't know as he made mention of the distance exactly, but he said he could be heard a great many miles, but the miles I disremember.

Cross-examination by Mr. Storrow:

Cross-Q. 33. Where did you last work at milling?

A. At Eberly's Mills.

Cross-Q. 34. What did you do next?

A. Coopering.

Cross-Q. 35. How long did you cooper?

A. Pretty near two years I carried on coopering in that cooper-shop at Eberly's Mills.

Cross-Q. 36. What did you do next?

A. Then I moved down across the creek to York county, and labored for four years.

Cross-Q. 37. Where did you labor, and for whom?

A. Labored some for Ross, some for Musser, Fisher, and some others around there; I couldn't just tell you; wherever there was

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anything to do; two years—four years—for the last five years I make fence.

Cross-Q. 38. You made an affidavit about this matter?

A. Yes.

Cross-Q. 39. When?

A. Last winter some time it was; I don't know just the date.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 5th day of May, 1881.
FRED. M. OTT,
Examiner.

ELIAS Z. GOOD.

IRA D. KAHNEY, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. My age is thirty-two years; residence is Camp Hill, Cumberland county; my occupation is boss in a stone quarry.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pennsylvania; and, if so, how long have you known him?

A. I have known him for twenty years.

Q. 3. Have you ever been in his shop at Eberly's Mills and seen any talking-machines there?

A. Yes, sir.

Q. 4. To your best recollection, when did you first see talking-machines there?

A. Between 1871 and 1872.

Q. 5. Did you hear anybody talking through them then?

A. Yes, sir.

Q. 6. Who was it, and who was he talking to?

A. Daniel Drawbaugh talking to me.

Q. 7. Where was he, and where were you at the time—I mean, in what parts of the shop were you?

A. He was in the upper part and I was in the lower.

Q. 8. Did you hear and understand distinctly what he said?

A. Yes, sir.

Q. 9. Were you and he on different floors?

A. Yes, sir.

Q. 10. What kind of instruments were they that he and you were using at that time?

A. It was a kind of a glass tumbler, and a machine fixed up. I couldn't exactly state what it was like.

Q. 11. Please look at the two machines, "B" and "F," now shown you, and state whether you have ever seen them, or either of them, before. If so, when first?

A. They are the first machines I ever seen—they are the machines I referred to.

Q. 12. Do you remember which of them you listened at and which he talked into?

A. I listened at this one ["B"]; he talked into that one ["F"].

Q. 13. From that time down to the summer of 1880, were you occasionally in his shop?

A. Yes, sir.

Q. 14. During every year?

A. Yes, sir.

Q. 15. About how often?

A. Sometimes every day, sometimes every week, and sometimes every month, just as it would suit to get there.

Q. 16. Did you ever see any more talking-machines there?

A. Yes, sir.

Q. 17–18. How often, and down to within what time?

A. I seen them there pretty often, down from 1873 and 1874, and down to a year ago.

Q. 19. Were they the same old machines or new ones?

A. Old ones and new ones together, as much as I seen.

Q. 20. From time to time, as you were there, from 1871 or '2 down to 1880, did you see him working on the talking-machines, or not?

A. Yes, sir.

Q. 21. Did you ever see this machine "J" there? If so, about how long ago, to the best of your recollection?

A. Yes, sir; I couldn't go back more than a couple of years on that.

Q. 22. Did you ever see this machine "H" there; and if so, how long ago?

A. Yes, sir; I seen that machine between 1876 and 1877.

Q. 23. Have you anything to fix the date when you saw that machine "H,"—that tall sloping one?

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A. No more than after I came home from the Centennial I was down in the shop one day. I merely looked at it there, the time I come home from the Centennial. That is about all I know of the machine.

Q. 24. To the best of your recollection, about how long after you came home from the Centennial was it that you saw this machine "H?"

A. It may be a couple of months.

Q. 25. Did you ever see this machine "A" there at the shop? If so, about when did you first see it?

A. Yes, sir; I seen it between 1873 and 1874.

Q. 26. Some time in those two years, do you mean?

A. Yes, sir.

Q. 27. Was it put into use?

A. Yes, sir.

Q. 28. Did you hear anybody talking through it. If so, whom?

A. I heard Daniel Drawbaugh talking through it.

Q. 29. Where was he, and where were you, when this machine, "A," was used?

A. He was upstairs, and I was down stairs, in the lower part.

Q. 30. Who was talking?

A. Daniel Drawbaugh.

Q. 31. Who had the machine "A," he or you?

A. I had this machine "A."

Q. 32. Did you hear what he said through the machines?

A. I did at that time, but I couldn't mind any more what he said. I could tell that it was Daniel Drawbaugh speaking, and understand what he said.

Q. 33. Did you, at any time, see there the two small machines, "D" and "E," with the curled magnets?

A. Oh, I may have seen them, but paid no attention to them at all.

Q. 34. Do you recollect anything about them?

A. I have seen them there, but, of course, I couldn't say much about them at all. Don't remember much about them at all.

Q. 35. Is it your recollection that you saw them before or after you first saw the machine "A"?

A. I seen them after I saw that.

Q. 36. What is your best recollection as to how long it was after you first saw "A" before you saw these two, "D" and "E"?

[*Objected to by Mr. Storrow.*]

A. It was a couple of years.

Q. 37. Do you testify to that with certainty, or only as to your best recollection?

[*Objected to by Mr. Storrow.*]

A. To my best recollection.

Q. 38. Please look at the machines now shown you, marked "G," "K," "L," "M," "N," "O," and state whether you ever saw them, or any of them, at Mr. Drawbaugh's shop, and, if so, can you give the time?

A. I may have seen all the machines; but, of course, I couldn't give the times when I seen any of them.

Q. 39. Do you think you saw as many as that, at different times when you were there?

A. I did at some of the times when I was there.

Q. 40. From time to time, as you would go there, did you see new machines that you had not seen before?

A. Yes, sir.

Q. 41. Did you ever hear Mr. Drawbaugh say anything while you were there in the shop about patenting the talking-machine invention?

A. Yes, sir; he told me if he had the means he would get it patented.

Q. 42. Did he ever tell you how far he could talk through the machine and be heard?

A. He told me he could talk the same for miles as he could for a short distance.

Q. 43. Do you remember how the machines were connected when they were used?

A. They were connected with a wire from the top of the shop to the bottom.

Q. 44. Do you remember whether one or two wires?

A. Two wires.

Q. 45. Did you know anything about Mr. Drawbaugh's financial condition along during those years, of which you have testified?

A. Yes, sir; Dan Drawbaugh was poor.

Q. 46. How poor was he?

A. He was so poor that the neighbors wouldn't trust him hardly for anything.

Q. 47. Do you recollect seeing Mr. Drawbaugh working in his shop late at night on the talking-machines at any time or times?

A. Yes, sir.

Q. 48. How often do you remember that occurrence?

A. I hardly know how often. I have been there so often at night that he has been working on them that I would hardly know.

Q. 49. From all you saw of Mr. Drawbaugh and his work, from 1872 down to 1880, what invention would you say that he was principally working on and giving his attention to during all that time?

A. I would say the talking-machine.

Cross-examined by Mr. Storrow:

Cross-Q. 50. What other inventions did he give attention to during that time?

A. He was working at the molasses faucet for one that I know.

Cross-Q. 51. Do you know of any others that he was giving much attention to during that time; and if so, what were they?

A. No, sir; I know of none, for my part.

Cross-Q. 52. When was it that you saw him working at night work—in what years?

A. That is more than I can tell, what years. He used to work most every night. When he used to live at Mechanicsburg, he used to be there, and worked most every night.

Cross-Q. 53. By "there" do you mean at the shop?

A. Yes, sir.

Cross-Q. 54. How did you happen to be there so often nights?

A. Because I live right close there, and I used to go there to pass the evening.

Cross-Q. 55. You have testified that he was poor; do you mean that to apply to all the years from 1872 to 1880?

A. Yes, sir.

Cross-Q. 56. When was it that he told you that if he had the means he would get it patented?

A. That was between 1873 and 1874, as near as I can get at it.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 5th day of May, 1881.
FRED. M. OTT,
Examiner.

IRA D. KAHNEY.

Adjourned until the 6th instant, at 10 o'clock, A. M.

May 6, 10, *A. M.*

Examination resumed, pursuant to adjournment.

Present, Mr. Storrow and Mr. Smith for complainants, and Mr. Hill, Mr. Jacobs, and Mr. Abraham for respondents.

JACOB SHETTEL, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. I will be forty-four in the coming fall.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pennsylvania; and, if so, how long have you known him?

A. I have known him for thirty-five years.

Q. 3. Please look at the machines "B" and "F," now shown you, and state whether you have ever seen them before; if so, when did you first see them?

A. Yes, sir; I have seen them, about nine years ago.

Q. 4. How did you happen to see them at that time?

A. I went down to Mr. Drawbaugh's shop, and in the room in the shop he had those machines on a bench. He showed them to me and told me it was a talking-machine; that he was experimenting with them. He had, at that time, a skin or bladder of some kind across the end of it—of "B"—next to the coil of wire, and on that head, or skin, he had a bar of iron across about three eighths or one half an inch wide, reaching about two thirds across the head. Then he had, with this coil of wire, [indicating the electro-magnet of "B,"] two wires connecting with this; one wire leading from the coil or electro-magnet to the tumbler with the mouthpiece on [indicating "F;"] another connected to the same piece leading to another tumbler, which he called his battery, with some solution of a liquid kind in, and a wire from the battery to the electro-magnet. That, he said, formed a circuit of the battery, by means of which he could talk. He didn't talk through it to me, as the skin or bladder was torn or bursted loose about an inch along the edge of this cylinder of tin, which, he said, prevented his using it. But, he said at the same time, if he had a wire from the shop in connection with the telegraph wires at White Hill, that he could talk to Mechanicsburg by having a machine there, or an instrument in the office. He also said it would be better than telegraphing, and that it would be worth a great deal of money. I don't remember that he said anything more at that time.

Q. 5. Referring to the bar of iron that was attached to the skin or bladder on the end of the tin cylinder, do you remember how or in what direction that extended? If so, please indicate.

A. Right horizontally; directly in front of the electro-magnet, very nigh touching it.

Q. 6. State what you remember as to the construction of the tumbler instrument, "F," and whether you looked into its interior, or not.

A. I seen a piece of tin he had over the mouth of the tumbler, right across underneath the mouth-piece. I did not look into the glass below. I could not see in on account of the tin. The bottom of the tumbler was not broken out. The tumbler seemed to be coated with white material on the inside. I didn't ask him, nor did he tell me what it was.

Q. 7. How do you fix the time of that interview as being about nine years ago?

A. I paid a visit to an uncle of mine living in that place within two years after I was married. I was married eleven years ago last January.

Q. 8. Did you know about the Haucks purchasing and commencing to carry on the faucet business at that shop?

A. Yes, sir.

Q. 9. Was the interview which you have described before or after the Haucks assumed control of the faucet business?

A. Before.

Q. 10. What business was going on at the shop, if any, at the time of that interview?

A. Not any business.

Q. 11. Do you recollect whether, prior to the time of that interview, the old faucet company had been carrying on business at that shop?

A. Yes, sir; they had been manufacturing faucets.

Q. 12. Did you see any faucets lying around there at the time of the interview which had been made before?

A. Yes, sir; I seen a few lying around the shop.

Q. 13. Were you a member of the company which undertook, a few years ago, to manufacture the Drawbaugh electric clock at that shop?

A. Yes, sir; I was.

Q. 14. At what time did that electric clock company go into operation or commenced its business?

A. The first of April, 1878.

Q. 15. Did you, or not, take a pretty active part in starting that company, and arranging the preliminary negotiations with Mr. Drawbaugh therefor?

A. Yes, sir; I did.

Q. 16. For what length of time, prior to starting up the clock company, were you looking into the matter and talking to Mr. Drawbaugh about it?

A. About one year; I had first spoken to him about it, or he to me.

Q. 17. During that one year, prior to starting up the company, were you, or were you not, frequently at his shop?

A. Yes, sir; I was.

Q. 18. Please look at the instrument now shown you marked "H," and state whether you ever saw it before, and, if so, when you first saw it, to the best of your recollection.

A. I saw it early in the spring of 1877.

Q. 19. Was it, or was it not, there at Mr. Drawbaugh's shop, at or prior to the time when you first began to investigate the electric clock business with a view to going into it?

A. Yes, sir; it was there in the spring of 1877; the year before we went into the clock business, I saw it.

Q. 20. Did you hear any conversation through it at that time?

A. Not any conversation. He rang the bell attached to it; that is all he did to it.

Q. 21. Did he tell you what it was for?

A. Yes, sir; he told me what it could be used for, for giving alarms and calling at rooms of hotels.

Q. 22. Did he tell you what the machine "H" was—what name did he give it?

A. I don't remember that he gave it any name.

Q. 23. Did he speak about its being a talking-machine, or not?

[*Objected to by Mr. Storrow as leading, and as an attempt to obtain an answer from the witness on a subject on which his memory has been exhausted.*]

A. I don't remember that he said anything about its being a talking-machine.

Q. 24. Did you understand, at the time, whether it was a talking-machine, or not?

[*Same objection, and also that the question is not competent.*]

A. I don't know that I did. There was very little explanation of that instrument that he gave to me at that time.

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Q. 25. Please look at the two machines, "D" and "E," now shown you, and state whether you ever saw them before. If so, about when you first saw them, to the best of your recollection?

A. I saw them about the year 1875.

Q. 26. Who showed them to you, and where?

A. Mr. Drawbaugh showed them to me in his shop.

Q. 27. Please look at the instrument "A" now shown you, and state whether you ever saw it before; and if so, state whether you first saw it before or after you first saw the instruments "D" and "E."

A. Yes, sir; I saw it some time before I first saw those two smaller ones ["D" and "E;"] how long before I can't say.

Q. 28. Who showed it to you, and where?

A. Mr. Drawbaugh showed it to me in his shop.

Q. 29. Did you hear anybody talking through it, or see anybody listening at it?

A. Mr. Drawbaugh talked into it, or showed me how he adjusted it, as he called it, to make sounds or receive words through it. He screwed it up, using his breath or the power of his voice, and making it buzz like a bee.

Q. 30. How often were you in Mr. Drawbaugh's shop, to the best of your recollection, between 1872 and the spring of 1878?

A. I was there a number of times, just how often I couldn't say.

Q. 31. As you would be there from time to time, during that period, did you, or did you not, see him working upon his talking-machines, or hear him talk about them?

A. He spoke to me at different times about them. I don't know that I seen him directly working upon them.

Q. 32. What would he say about them from time to time during that period?

A. He was improving them—getting them that he could talk plainly through them and be understood plainly.

Q. 33. About when did he tell you this—at any particular time, or all along during the time?

A. Along during the time when I was there.

Q. 34. Please look at the instrument "C" and state whether you ever saw that at Mr. Drawbaugh's shop. If so, when?

A. Yes, sir; saw this at the time I saw the first one ["B" and "F"].

Q. 35. State whether or not you saw other talking-machines there along during that time, from 1872 to 1878, besides these instruments "A," "B," "C," "D," "E," "F," and "H."

A. Nothing else. That is all I saw.

Q. 36. State whether, at any time during that period, there was any conversation between you and Mr. Drawbaugh about patenting the talking-machine, or as to why he did not patent it at the time.

A. I don't remember of any conversation between us as regards patenting.

Q. 37. How long did the electric clock company continue its business after the first of April, 1878?

A. About one year.

Q. 38. Was its business financially successful, or did it result in a loss to the company?

A. It was not successful, as we expected it would be.

Q. 39. Was Daniel Drawbaugh in the employ of the electric clock company during that year?

A. Yes, sir; he was.

Q. 40. Was he paid anything by the company at the time it went into operation for the privilege of using his electric clock invention? If so, how much?

A. Yes, sir; we paid him on the first day of April, 1878, five hundred dollars.

Q. 41. During the year that he was employed by the electric clock company, was he employed on wages?

A. Yes, sir; he was.

Q. 42. Did the company pay him any wages for his year's work?

A. No, sir.

Q. 43. Why not?

A. Because there was an understanding, as we had thought, in the company, that he was to receive his wages out of the proceeds or profits, and there being none, he never got any wages.

Q. 44. Do you know what he did with the five hundred dollars that the company paid him on the first of April, 1878?

A. He told me that he paid three hundred dollars of it on a judgment on his house.

Q. 45. When did he tell you that?

A. He told me that about a week or ten days after we had paid him—after the first of April, and at that time he said he didn't have five dollars out of the whole of it.

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Q. 46. You mean out of the whole five hundred dollars?

A. Yes, sir.

Q. 47. Do you know whether he was in debt a good deal, or not, at that time?

A. Yes, sir; he told me that he owed considerable.

Q. 48. Do you know what his financial condition was during the year 1878? If so, what was it?

A. Yes, sir; it was pretty poor. He told me that he didn't have any money to get what he really should have for his family.

Q. 49. When did he tell you that?

A. Along during the year 1878.

Q. 50. State any other facts that you remember bearing on the subject of his poverty during that year.

A. We came to Harrisburg at various times during that summer, and he didn't have the money to pay his toll—five cents—across the bridge, and I paid it for him different times; and, also, he didn't have money to buy tobacco for himself, and I bought that for him several times; and I several times gave him a dollar, when we were over here, to buy groceries for his family.

Q. 51. During the year that your company was working there at the electric clock business, do you know whether or not he was in the habit of working in the shop late at night, after business hours were over?

A. Yes, sir; he told me, at different times, he was working up as late as two o'clock in the morning.

Q. 52. What was he so working at?

A. That I couldn't say. I never saw the instruments or material that he was working at in the night time, nor he didn't tell me what he was working at.

Q. 53. Do you know whether he was working at the business of the company during those nights?

A. No, sir; he was not doing anything for the company.

Q. 54. Do you recollect whether there was, during that year, any dissatisfaction expressed by the members of that company, or any of them, by reason of their belief that Mr. Drawbaugh's attention and mind were given to something else more than to the company's work?

[*Objected to by Mr. Storrow as leading and as assuming.*]

A. Yes, sir; there was. They seemed to think that he could make no headway at all in the clock; that his mind was entirely taken up with something else, and that he could make no progress, and that was my reason for selling out of it.

Q. 55. From all you know of what was going on, did you, at the time, suspect or believe what that something else was to which his mind was given?

A. At the close of the year, or nearly the close of the year, we did suspect that it was his talking-machine that he was working upon, yet he didn't tell us.

Q. 55½. When you were contemplating getting up the electric clock company, during the time from the spring of 1877 to the spring of 1878, knowing, as you did, about his telephone or talking-machine, why did you not go to work to organize a company upon that invention instead of the electric clock?

A. According to my own judgment or knowledge of his talking-machine, I did not think that there was half the value in that that there was in the clock. For that reason we took hold of the clock, there being a considerable excitement in the neighborhood about the clock. That made us think there was considerable value in it.

Q. 56. Am I to understand you that it was your judgment and belief that there was more money in a clock that would run without winding up than in a machine by which a man could talk from one place to another?

[*Objected to by Mr. Storrow, as leading, as argumentative, as assuming a state of facts not shown by the evidence, and as tending to induce the witness to vary the testimony already given.*]

A. Yes, sir; I thought there was more money in the clock.

Q. 57. Prior to the time when you got up the clock company, Mr. Drawbaugh had told you, as you have testified, that he could talk through his machine, and be heard as far as Mechanicsburg. Did you, or did you not, believe that statement to be true when you went into the clock business?

[*Objected to by Mr. Storrow, on the ground that proof of the witness's credulity is not competent evidence to sustain any issue raised by the defendant's answer.*]

A. Yes, sir; I did; but I never considered the talking-machine; my mind was taken with the clock.

Q. 58. In your fifty-fifth answer, you refer to there being considerable excitement in the neighborhood about the clock before you got up the clock company. Please explain more fully what you mean by that.

A. Persons were all over the neighborhood talking about the clock, thinking that it was a great invention, and that it would be worth a large amount of money.

Q. 59. Was the popular excitement greater at that time about the clock than about the talking-machine?

A. Yes, sir.

Recess for dinner.

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2 o'clock, P. M.

Examination resumed.

Present, same counsel.

Q. 60. When did you first see an electric clock in Mr. Drawbaugh's shop?

A. I think about 1871 or '2, or along there, was the first I saw the skeleton hanging against a board running in his room in his shop.

Q. 61. In your conversations with Mr. Drawbaugh, prior to getting up the clock company, did you, or not, manifest to him that your interest was in the clock rather than in any other of his inventions?

A. Yes, sir; I thought it best of all that he had invented yet.

Q. 62. Who were in the clock company besides yourself?

A. Jacob H. Grissinger and Theodore Grissinger, Daniel Drawbaugh, and myself.

Q. 63. Were the two Grissingers connections of yours? If so, what?

A. Yes, sir; brothers-in-law.

Q. 64. What was their regular business?

A. Jacob you might call a farmer; Theodore was in the agricultural implement business.

Q. 65. Where did they live?

A. Jacob lived at Shepherdstown, about five miles from Eberly's Mills, and Theodore lived at Mechanicsburg.

Q. 66. Do you know how the two Grissingers came to go into the electric clock business?

A. Yes, sir; as much as I know, by my influence.

Q. 67. Do you know what Mr. Drawbaugh's pecuniary condition was for eight or nine years prior to 1878—say from 1869 or '70 down to 1878?

A. As much as I know, poor.

Q. 68. How far was White Hill station from Eberly's Mills?

A. From a mile and a half to two miles.

Q. 69. How far from White Hill station to Mechanicsburg?

A. Between six and seven miles.

Q. 70. Prior to your getting up the electric clock company, did Mr. Drawbaugh ever say anything to you about desiring to get somebody to take hold with him, to help him to bring out his inventions, or any of them?

A. I don't know that he has, more than in the clock business, but he has made the remark to me, that if he had the means to go ahead himself with them, he could make more out of them.

Q. 71. Did you ever talk to him, prior to the establishment of the clock company, about going in with him on any other invention than the clock?

A. No, sir; not to my recollection.

Cross-examined by Mr. Storrow:

Cross-Q. 72. How old were you when you first knew Drawbaugh?

A. About eight years, between eight and nine years. I knew him since I know anybody.

Cross-Q. 73. Have you known him well ever since?

A. Yes, sir; very well ever since.

Cross-Q. 74. Has his character and behavior been such that you have uniformly respected him and liked him?

A. Yes, sir.

Cross-Q. 75. Where did you and he live when you first knew him?

A. When I first knew him, we lived in the same place, Eberly's Mills.

Cross-Q. 76. Did he have his shop there then?

A. No, sir; he had no shop there then. The shop was standing that is used as his shop now. It was at that time a clover-mill, for hulling-clover seed.

Cross-Q. 77. When did he begin to have a shop there?

A. I can hardly tell the exact time since he has had his shop. As far back as 1867, I know he had his shop there, manufacturing faucets.

Cross-Q. 78. When you moved away from Eberly's Mills, where did you go to?

A. We moved about eight miles from that place, along the Conadoguinet creek, on a farm owned by Orris, in East Pennsboro' township, Cumberland county.

Cross-Q. 79. When did you move there and when did you move away from there?

A. We moved there about thirty-nine years ago. We lived there six years, and we moved away about thirty-three years ago.

Cross-Q. 80. Where did you go to then?

A. We moved on the farm owned by Mr Merkel, near the village of Shiremanstown.

Cross-Q. 81. About how long did you live there, and where did you then go to?

A. We lived there seventeen years. Then father bought a farm near the village of Shepherdstown, and we moved up there.

Cross-Q. 82. How long did you live there, and where did you go to next?

A. It is thirteen years since father moved there. I had been only two years with him there when I got married and went for myself. I am now living near the village of Shepherdstown, and have been ever since I was married.

Cross-Q. 83. How old were you when you moved away from Eberly's Mills?

A. About five years, I think.

Cross-Q. 84. What has been your business the last ten years, besides farming?

A. The one year that we were in the clock business, and about the last ten years have been in the threshing business, running a steam separator in the latter part of the summer.

Cross-Q. 85. Do you own the steam thresher yourself?

A. Yes, sir.

Cross Q. 86. You have been in the habit of going to Drawbaugh's shop the last fifteen years, or of meeting him?

A. Yes, sir; I have occasionally been in the habit of going down, during this time, to his shop; seldom ever met him away from the shop.

Cross-Q. 87. You spoke in your testimony of his other inventions; what other inventions do you understand he has made?

A. There are different inventions that he has made. There are two faucets that he has invented; a water-motor and a number of other machines that he has made, such as a stave-cutter and stave.jointer. The clock was, too; can't just think of any others now.

Cross-Q. 88. Why were the negotiations about the clock business so long that they extended over a year?

A. For the reason that I did not feel myself able to put in the amount of money that he wanted paid down, and Mr. Grissinger would not consent for a time to go in with me.

Cross-Q. 89. How much did he want to have paid down when you first began the negotiations?

A. He wanted us first to pay him a thousand dollars, then afterwards he agreed to take five hundred.

Cross-Q. 90. Was he to have some more paid him afterwards? If so, how much more, and when was it to be paid?

A. He was to receive the one fourth, with the additional eight per cent. to that on the profits.

Cross-Q. 91. Was not he also to receive five hundred dollars out of the profits?

A. Yes, sir; I believe he was to receive five hundred additional out of the profits, making him the thousand then.

Cross-Q. 92. I suppose that you and the two Grissingers paid the five hundred dollars cash which he received, didn't you?

A. Yes, sir; we paid him that cash on the first day of April, 1878.

Cross-Q. 93. Tell me what clocks of his invention you saw before you made the payment.

A. I saw the one which now stands in Mr. Chellis' store, behind the door, and there is one hanging over in the shop that was made then.

Cross-Q. 94. Were those all the clocks of his you saw before you made the payment in April, 1878?

A. All that were finished. He had a skeleton, his first invention of it. I saw that a good while ago, ten or twelve years ago, somewhere along there.

Cross-Q. 95. What electric clocks did you see running at his shop, during that year of negotiation?

A. There was one running there, controlled by a large, eight-day clock.

Cross-Q. 96. Was the eight-day clock run by a weight, or spring, or was that itself run by electricity?

A. That was run by a weight.

Cross-Q. 97. Then the electricity was only to enable the eight-day clock to control the other; is that right?

A. The large clock was run by a weight, and, in some way, he had wires connecting the large clock from the bottom, and to the other clock that was controlled by it. I never examined particularly how he had it connected.

Cross-Q. 98. The invention which you bought, then, was the principle of having one clock control another by having them connected, by wire, with an electric battery, was it?

A. No, sir; the principle was to be controlled by a battery from the earth by itself.

Cross-Q. 99. Do you mean so that all the clocks should run without any driving springs or weights in any of them?

A. All those that were to be magnetic clocks were to be run without springs or weights.

Cross-Q. 100. They were to be run by magnetism, which they took up from the earth—is that it?

Q. Yes, sir; electricity obtained from the earth.

Cross-Q. 101. How many clocks of his, running on that principle, did you see before you paid him the five hundred dollars?

A. Two; one in Mechanicsburg, at Mr. Shapley's, and one in the shop.

Cross-Q. 102. Were those two in addition to the clocks you previously mentioned?

A. No, sir; the one is. I disremembered the one at Shapley's; the one in the shop is the one I mentioned.

Cross-Q. 103. In your ninety-third answer, you speak of two clocks, one of which now stands in Mr. E. W. Chellis' store, and one of which now hangs over in the shop; were these the clocks that you have just referred to as running by electricity from the earth, and made before April, 1878?

A. No, sir; not the two. The one that is now in the shop was then running by electricity from the earth; the one in Mr. Chellis' store was not running.

Cross-Q. 104. Was the Chellis clock built then, and where did you see it before April, 1878?

A. Yes, sir; it was built and finished, standing in the shop there, all except the electro-magnet.

Cross-Q. 105. Now, I wish you would enumerate all the clocks of his invention that you saw before April, 1878, that employed electricity in any way, including those that were connected with another clock and a battery, as well as those that ran, or were intended to run, by electricity obtained from the earth?

A. There were four, including the skeleton of his first invention—his experimenting works.

Cross-Q. 106. Please state where each of them were when you saw them during that year of negotiation, and give some description of each of them.

A. The one was at Shapley's room at Mechanicsburg, the other one is the one that is in the shop now, and was at that time; that was run by electricity of the earth. One was in the shop at the beginning of the year that was controlled by the eight-day clock. This skeleton that had been running when I first saw it was not up at that time.

Cross-Q. 107. Which of those four clocks ran, or was intended to run, by electricity from the earth?

A. The one at Mr. Shapley's. The skeleton works that had been up ran by electricity from the earth, and the one that is hanging in the shop at the present time.

Cross-Q. 108. Which of those four is the one that is now at Mr. Chellis'?

A. Not any of them.

Cross-Q. 109. Then, am I to understand that the Chellis clock was a fifth clock, which you saw completed in the shop before 1878, but which had not been started at that time?

A. No, sir; it was not the fifth clock. I did not understand that the one hundred and fifth question included clocks that were not running.

Cross-Q. 110. In your one hundred and sixth answer, you refer to four clocks beside the eight-day clock. Did you see the Chellis clock completed before 1878, and was it one of those described in your one hundred and sixth answer, or was it an additional one?

A. The Chellis clock was additional to those four. It was not described by that answer, but it was not running.

Cross-Q. 111. Were there any clocks of his invention that you saw before April, 1878, in addition to those described in your one hundred and sixth and one hundred and tenth answers?

A. No, sir; there were no others that I saw.

Cross-Q. 112. In what year was the Shapley clock built?

A. I don't know that I can exactly tell you when that was built; in 1876, or 1877—it may have been built in 1875; that is as near as I can remember.

Cross-Q. 113. When did you first see it?

HONE COMPANY,-1

A. I believe it was about the beginning of 1876 that I first saw that one at Mr. Shapley's.

Cross-Q. 114. When was the Chellis clock built?

A. In the after part of the winter of 1877.

Cross-Q. 115. When was the clock that is now in the shop built?

A. I couldn't remember when that was built—after the skeleton; 1874, or 1875, along there.

Cross-Q. 116. When did he build the clock that was controlled by the eight-day clock?

A. That I can't tell you, when he built that one. It is ten or eleven years since I first seen it in motion.

Cross-Q. 117. Was the Shapley clock ever at Drawbaugh's shop running?

A. No, sir; I think it was not.

Cross-Q. 118. Was it ever there at all?

A. The case was not, but the works Dan made there at the shop—so he told me.

Cross-Q. 119. When did you first see the works of the Shapley clock at Dan's shop?

A. I never saw them at all there at Dan's shop.

Cross-Q. 120. Did your company apply for or take out any patents on the inventions you bought of Drawbaugh?

A. Yes, sir; made applications for patents, and, I think, received one upon the ground battery. Others were not granted while I was in the company.

Cross-Q. 121. How many clocks did your company manufacture?

A. We only completed two, and put up the case of another one and part of the works.

Cross-Q. 122. Where were they made?

A. Over in Drawbaugh's shop.

Cross-Q. 123. Did your company buy, or have made for them, any of the tools or machinery to make any of these clocks with?

A. Yes, sir; we bought several small lathes and a few other tools.

Cross-Q. 124. Did you get up a gear-cutter for them?

A. No, sir; I believe he had a gear-cutter of his own at the time.

Cross-Q. 125. One of his own make, or one that he had bought?

A. I am not positively certain as to that. It appears to me one of his own make.

Cross-Q. 126. When did your company sell out and to whom?

A. I sold out in the spring of 1879. The Grissingers held their interest a year later, when they sold to E. W. Chellis. I sold to Mr. Jacobs, and he sold to Chellis.

Cross-Q. 127. Why did you sell out?

A. Because we couldn't get the thing to move on as we would have liked, or make any headway.

Cross-Q. 128. You spoke of a faucet company that made faucets at his shop some time before 1870. Did that company continue up to the present time, or did they stop manufacturing?

A. They stopped manufacturing, I think, somewhere about 1870 or 1871.

Cross-Q. 129. Were their remains afterwards sold out to anybody; and, if so, to whom, and when?

A. Yes, sir; at least, the greater portion of them, so far as I know were sold to the Haucks, I think about the beginning of 1873, as near as I can recollect.

Cross-Q. 130. Did the Haucks begin to manufacture Drawbaugh's faucets at his shop; and, if so, how long did they continue?

A. Yes, sir; I think they manufactured, or continued there, about one year.

Cross-Q. 131. What was the next manufacturing business done there?

A. Kline's axle-tree company were manufacturing there.

Cross-Q. 132. How long did they continue?

A. I believe they were about a year, or a little over, at work.

Cross-Q. 133. Did the Haucks make much money, manufacturing those faucets there?

A. That is more than I can say. I don't know.

Cross-Q. 134. I suppose you only know that they worked there for a year and then stopped. Is that all you know about that business?

A. That is about all I know.

Cross-Q. 135. Has a different faucet, invented by Drawbaugh, ever been manufactured there since?

A. I guess they are manufacturing, at the present time, a different faucet there; I am not positive about that.

Cross-Q. 136. Who is doing it?

A. E. W. Chellis and Mr. Drawbaugh.

Cross-Q. 137. When did Mr. Chellis begin this faucet business with Mr. Drawbaugh?

A. He went in as a partner with him several years ago.

HONE COMPANY,-1

Cross-Q. 138. Are these talking-machine instruments, that you have testified about, in the same condition now that they were then?

A. No, sir; they are not.

Cross-Q. 139. Please state the difference in each of them between the condition they were in when you first saw them and the condition they are now in.

A. This one marked "F," the bottom was in it then, and it had a tin plate over the top of the tumbler underneath this mouth-piece, that is not in it now. This here one marked "B" was lined with some substance on the inside of the cylinder. I see a small portion of it now. The remainder has broken loose, that had been all solid when I first saw it. It also had a bladder or skin of some kind that closed the end, and a small iron bar parallel across the end about the middle of it, three eighths or one half inch wide, reaching about two thirds across the head, which is not here now. Then it was also with wires connected to the tumbler "F," and the battery, which is not connected now. That is about the difference in condition from that time to this, that I can give. Those [indicating "A," "D," and "E"] are in about the same condition now that they were in when I first saw them; this [indicating "C"] is about in the same condition as when I saw it. This [indicating "H"] is about the same, as near as I can recollect.

Cross-Q. 140. I suppose you saw the inside of these instruments, "A," "C," "D," "E," and "H," the first time you saw them, didn't you, so as to know that the working parts are the same now that they were then? And that you remember what the insides were then?

A. No, sir; I didn't neither see the insides then nor now, but the condition, as near as I can remember, was the same then as it is now.

Cross-Q. 141. Did you see these instruments during the year that you were negotiating about the clock, and during the year that your company were at work at Drawbaugh's shop?

A. Yes, sir; I seen all of them during that time.

Cross-Q. 142. Did you see them often?

A. No, sir; I did not see them often, as I was not paying much attention to them, but thinking of clocks.

Cross-Q. 143. Were you there often during those two years?

A. Yes, sir; I was there a number of times during the year 1877, and, during the fore part of the summer of 1878, I was there pretty nearly every day some weeks.

AMERICAN BELL TELEPHON

Cross-Q. 144. How many times had you seen "F" and "B" before 1877?

A. I am not able to say how often, but I saw them quite a number of times.

Cross-Q. 145. When did you first notice that the bottom had been broken off of the glass tumbler "F?"

A. I don't remember when I noticed that first; perhaps several years ago.

Cross-Q. 146. Was it about the time you began to go there negotiating for the clock?

A. I believe it was off at that time.

Cross-Q. 147. And that is about the first time you saw it off, isn't it?

A. As near as I can recollect. I don't remember; I was not paying any attention to it.

Cross-Q. 148. You paid enough attention to it to be able to testify about the tin plate and connections which you have described, I suppose?

A. Yes, sir; but I remember that from the first time seeing it, which the bottom was not off then.

Cross-Q. 149. During the year 1877, did Drawbaugh speak with you about his talking-machine?

A. .He did speak to me something about his talking-machine that he was experimenting with. He gave me no full particulars, though.

Cross-Q. 150. Did he, during that year, ask you to take an interest with him and furnish money to take out a patent on it?

A. No, sir; he did not. If he should have, I should not have taken it, for I did not think there was much in it.

Cross-Q. 151. What was it, in 1878, that led you to think Drawbaugh was spending his nights on the talking-machine?

A. For the reason that he made a few remarks toward the close of the year 1878, and told us, still, that he was working up as late as two o'clock at night, and we knew he was not working for the company, which led us to think he was working on that.

Cross-Q. 152. You have testified that you and your partners, or you, thought that he was not doing that justice to the company that he ought to, and, therefore, sold out. What led you to think so?

A. For the reason that we could not make no progress at all in the clock, and we, therefore, sold out. He seemed to be all the time studying at something in his head.

Cross-Q. 153. You have testified about his extreme poverty in 1878. Don't you think you have rather over-stated his poverty?

A. No, sir; not if I dare believe his own words.

Cross-Q. 154. You have testified that he was a friend of yours, and was so very poor in 1878, and that you let him work for your company that year and paid him no wages. Don't you think you have rather overstated the friendship, if he really was as poor as you say?

A. I don't know that I have. I think he is just as good a friend of mine to-day as he was in 1878 and before. And we, as al others in business, having a contract as we thought, think it right to live to that contract. And he, not alone in 1878, was poor, but before that was just as poor as in 1878.

Cross-Q. 155. You made a bargain with him to work for your company, may be for a year, and he was not to receive anything for wages, unless profits came at the end Do you think it was the act of an old friend to make such a bargain and expect him to live under it, if he was as poor as you say he was?

[*Objected to by Mr. Hill as improper, incompetent, and immaterial, and assuming to state the terms of the contract differently from what has been proved.*]

A. Yes, sir; when I make a bargain or contract, I always expect to live up to it, and I think it is perfectly right that everybody else should.

Cross-Q. 156. If he was as poor as you say, how did you suppose he was going to live at all and support his family under such a contract?

A. Just as he did before he made that contract, by working many days for nothing, and depending upon his creditors to give him as they had been giving him before; but if he had asked me for the loan of twenty-five or fifty dollars, I should have done it; but he never asked me for the loan of any money, with the exception of several dollars that I gave him at times, here in Harrisburg, when we were over.

Cross-Q. 157. Do you mean that it was your expectation, knowing, as you say, how poor he was, that he would work for you, and live on his creditors; and that you would leave them to stand it, and not pay anything yourself, unless it came out of the profits of the business?

A. I didn't expect him to live on anybody; and I never pay anything unless I am asked for it.

Re-direct by Mr. Abraham:

Q. Q. 158. Did you and your associates, including Mr. Drawbaugh, not go into the clock company with the expectation of making a profit out of it?

A. Yes, sir; we went in with the expectation of making a considerable amount of money during the first year, which we were badly disappointed in.

Q. Q. 159. Then you expected that Mr. Drawbaugh would be compensated for his wages out of his share of the profits of this enterprise, if I understand you correctly?

A. Yes, sir; we expected the profits to pay his wages, out of his share of them. That was the understanding.

Q. Q. 160. Were you authorized at any time to expend any of the funds of this clock company to gratify your friendly feeling to any one, or were you limited to apply it to the actual debts of the company?

A. All money was to be applied to the debts of the company, not spent on friends; but we never had the opportunity to expend much in either way.

Q. Q. 161. Do you recollect the date when you last saw that clock at Mr. Shapley's, in Mechanicsburg?

A. I don't think I saw it later than the fore part of the summer of 1878.

Q. Q. 162. In your cross-answers 151 and 152, you speak of your coming to the conclusion, towards the close of 1878, that Mr. Drawbaugh was working at nights on the talking-machine, and of the fact that he seemed to be all the time studying at something. State whether you had or had not noticed, before the latter part of 1878, that his mind seemed to be dwelling or studying upon something else besides the clock business.

A. I don't know that I did pay any attention to it before. At that time, he made a remark about working at night, and that made me think so.

Re-cross by Mr. Storrow:

Re-Cross-Q. 163. In 1878, Drawbaugh was getting up a new faucet and trying to get people to go into that with him, was not he?

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A. As for that part, I could not say. He had models for that last faucet several years previous to that time, and I saw them.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to this sixth day of May, 1881, before me.
FRED. M. OTT,
Examiner.

JACOB E. SHETTEL.

Adjourned to May 7, 1881, at 10 o'clock, A. M.

May 7, 1881, 10 *o'clock, A. M.*

Examination resumed, pursuant to adjournment.

Present, Mr. Smith for complainants, and Mr. Hill, Mr. Abraham, and Mr. Jacobs for respondents.

W. M. LORY, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. Am going on fifty-one; reside in Latimore township, Adams county, Pennsylvania. I am a carriage-maker by trade.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pennsylvania; and, if so, how long have you known him?

A. I have known him for about seventeen years now, as near as I can state.

Q. 3. Did you ever hear him say anything about being at work trying to get up a machine or invention for talking to a distance? If so, what did he say, and when was it that you first heard him speak about it?

A. Yes, sir; it was in the fall of 1864. He told me that he was about making a machine to talk through a distance of about twenty miles. He showed me a draft of it on paper.

Q. 4. Did he tell you, or try to give you any idea as to how the machine would work?

A. Yes, sir.

Q. 5. On what principle did you understand him, that he expected it to work?

A. I thought that it was to be a kind of a trumpet. I couldn't get no sense out of it.

Q. 6. Did he say anything about its being like or unlike the telegraph? If so, state what he said.

A. He said it would work something like the telegraph, but you would have to talk into it—not blow in it. I thought it was to be a trumpet, as before stated.

Q. 7. You did not understand the invention, that he was speaking about, did you?

A. No, sir.

Q. 8. What did you think about the matter, when he spoke of talking twenty miles?

A. I thought that Mr. Drawbaugh had turned out to be a fool.

Q. 9. Did you understand him that he had invented the machine, or that he was trying to invent the machine, at that time?

A. I understood him that he had it invented and the plans made, but he was going to make the machine.

Q. 10. What kind of a drawing was it that he showed you—one he had made before, or one that he made at the time to aid in explaining it to you?

A. He had a drawing made on paper.

Q. 11. Did you examine the drawing pretty carefully?

A. Yes, sir.

Q. 12. Have you in your memory still an idea of that drawing—how it looked?

A. Yes, sir.

Q. 13. Please take a sheet of paper and make a rough drawing, as near like that as you can remember.

A. That is it, sir, [handing examiner a drawing, which Mr. Hill puts in evidence as "exhibit-Lory" of this date.]

Q. 14. What idea did you get about this part of the drawing that I mark "A," as to what it was?

A. It was hollow inside.

Q. 15. The same question as to this thing here, which I mark "B," "B," "B," "B," "B?"

A. It was to be a bench or table where this machine was to set on.

Q. 16. The same question as to the two lines, which I mark "C," "C?"

A. He said they were wires that ran into this machine.

Q. 17. The same question as to the part that I mark "D?"

PHONE COMPANY,-1

A. He said that was something like a cup; an opening where you talked into.

Q. 18. How do you fix the time as being in the fall of 1864?

A. Mr. Eberly had a buggy wheel broken, and I had occasion then to go down to the mill to see about it, where Mr. Eberly's office was. Then I went once to Mr. Drawbaugh's from Mr. Eberly's office. Mr. Eberly wanted me to come down to see about fixing the buggy wheel. That was my business.

Q. 19. What Eberly?

A. Mr. Christian Eberly.

Q. 20. Where were you living at that time?

A. I was living in Mr. Eberly's house at Eberly's Mills.

Q. 21. How long after that did you live in Mr. Eberly's house?

A. Not long; I moved away that fall.

Q. 22. Where did you move to?

A. To Shiremanstown.

Q. 23. Did you ever reside at Eberly's Mills afterwards?

A. No, sir.

Q. 24. I am to understand that that conversation with Mr. Drawbaugh was in Drawbaugh's shop?

A. Yes, sir.

Q. 25. State whether or not you have ever been in Mr. Drawbaugh's shop since the fall when that conversation took place?

A. No, sir; I never have.

Cross-examination waived by Mr. Smith.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 7th day of May, 1881.
FRED. M. OTT,
Examiner.

W. M. LORY.

SAMUEL NICHOLS, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. I am not quite fifty-one yet; I reside at White Hill, Cumberland county, Pennsylvania; I am a civil engineer.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pennsylvania, and if so, how long have you known him?

A. Yes, sir; I have known him, I suppose, about twenty-five years, at least.

Q. 3. How long have you lived at White Hill station?

A. I have lived there thirteen years. I moved there about the middle of March, 1868.

Q. 4. Since you lived at White Hill, have you ever seen Mr. Drawbaugh's talking-machines? If so, when and where did you first see them?

A. Yes, sir; I saw it at Milltown, in the mill. He showed it to me about the second summer after I moved there to White Hill. It was in the old clover-mill—formerly called—where the shop is now.

Q. 5. Was anybody present? If so, how many and who, when you first saw the talking-machine?

A. Yes, sir; my son-in-law, Samuel Bruce, was along with me at the time, and there was others there, but I could not recollect who they were at present.

Q. 6. Were the talking-machines operated during that visit?

A. Yes, sir.

Q. 7. Who operated them?

A. Mr. Drawbaugh.

Q. 8. When he was talking into the machine, who listened?

A. My son-in-law listened in the first place. Mr. Drawbaugh spoke through it, and my son-in-law said he heard it very distinctly. Then he spoke through again, and I listened, and I heard it very distinct.

Q. 9. Did you hear and understand what he said when he spoke through it and you listened

A. Yes, sir.

Q. 10. When Drawbaugh spoke, and Mr. Bruce and you listened, where was Mr. Drawbaugh, and where were you and Mr. Bruce?

A. Mr. Drawbaugh was in the regular shop department. There was then an open space between that, and then there was a little drawing room in which Mr. Bruce and I were.

Q. 11. Do you mean that Mr. Drawbaugh was in one room, you and Mr. Bruce in another room, and that there was an open space between the two rooms?

A. Yes, sir.

Q. 12. You say there were several parties there besides Mr. Drawbaugh, Mr. Bruce, and yourself. Were those parties in the room with Mr. Drawbaugh, or in the room with Mr. Bruce and yourself?

A. They were in the room with Mr. Drawbaugh.

Q. 13. Could you see Mr. Drawbaugh when he was talking into the machine?

A. No, sir.

Q. 14. Could you hear him except through the instrument?

A. No, sir.

Q. 15. How did you know that it was Mr. Drawbaugh that was talking, instead of some other party in the room with him?

A. I knew Mr. Dan Drawbaugh's voice very plainly.

Q. 16. Could you understand through the machine what he was saying?

A. Yes, sir; all that he spoke.

Q. 17. Was the machine into which he spoke connected in any way with the machine at which Mr. Bruce and you listened? If so, how?

A. There were two wires—they were connected by the wires.

Q. 18. Please look at the machines "B" and "F," now shown you, and state whether you ever saw them before. If so, when and where you first saw them.

A. Yes, those are the same machines I saw at Mr. Drawbaugh's shop at that time. I listened at the machine marked "B," and he spoke into the machine marked "F."

Q. 19. Do you remember whether the tumbler "F" had its bottom broken off at that time or not?

A. I did not observe that.

Q. 20. Do you remember whether it appeared to be lined with something white inside?

A. Yes, sir; it was lined.

Q. 21. Do you remember at that time seeing the electro-magnet on machine "B"?

A. Yes, sir; I seen that.

Q. 22. Do you recollect whether the end of the tin tube of machine "B," nearest to the electro-magnet, was covered with anything or not, at that time?

A. I think there was something there; I would not be positive, I think there was something.

Q. 23. Do you remember whether the tin box was lined with anything like plaster-of-Paris, or not?

A. I don't remember any more whether it was lined with anything or not.

Q. 24. Before you and Mr. Bruce went down there to Mr. Drawbaugh's shop, on that occasion, had you heard any talk in the neighborhood about his talking-machine invention or not?

A. Yes, sir.

Cross-examined by Mr. Smith:

Cross-Q. 25. How far is your place of residence from Eberly's Mills?

A. About a short mile.

Cross-Q. 26. How long did you listen to the machine while Mr. Drawbaugh was speaking?

A. He only spoke a couple of words.

Cross-Q. 27. How long did Mr. Bruce listen?

A. About the same length of time—just a couple of words.

Cross-Q. 28. What did Mr. Drawbaugh say to you about the invention?

A. He told us at that time that it was a speaking-machine.

Cross-Q. 29. Was that all he said?

A. That was all he said, with the exception—he did not say what distance, or anything of that sort. That was all that was said by him.

Cross-Q. 30. What do you mean by "with the exception?" What else, if anything, did he say?

A. He did not say anything more, I believe, on that subject.

Cross-Q. 31. How came he to show you the instruments?

A. We walked in there on purpose to see his machinery, and he commenced showing us then.

Cross-Q. 32. What did you say to him about the invention, at that time?

A. I thought it was quite an invention at the time—something very needful.

Cross-Q. 33. My question was, what you said to him about it at that time. Please state what you said, if anything.

A. I thought it would be very handy in a town, for talking through from one place to another.

Cross-Q. 34. When you told him that, did he make any reply?

A. Yes, he did speak something about it, but I couldn't say, really, what he did say concerning it.

Cross-Q. 35. Did you ever talk to him about it after that?

A. No, not after that.

Cross-Q. 36. Who were the neighbors that you heard speak about it before you went there?

A. I could not just remember.

Cross-Q. 37. Can't you give the names of some of them?

A. I couldn't just give the names to be positive.

Cross-Q. 38. According to your best recollection, who had you heard talk about the invention before you went to Drawbaugh's shop?

A. I think I heard Mr. Coble and Mr. George Free talking about it.

Cross-Q. 39. Any others?

A. No, I think not.

Cross-Q. 40. How often have you been in the habit of seeing Mr. Drawbaugh since that time?

A. I have seen him a half-dozen times, since that time, or maybe more.

Cross-Q. 41. You only live about a mile from him, don't you?

A. Yes, sir; a short mile.

Cross-Q. 42. Do you think you have only seen him a half-dozen times, during all these years, since that time?

A. I may have seen him, probably, more; I do not exactly know.

Cross-Q. 43. Do you mean that you probably have seen him more times than that?

A. I have seen him more than a half-dozen times, I suppose, but how many more, I would not be able to say.

Cross-Q. 44. Will you give me your best judgment as to how many times you may have seen him since your visit to his shop?

A. I don't suppose that I have seen him over eight times, at the outside.

Cross-Q. 45. When did you next see the instruments "B" and "F?"

A. I seen them about 1869.

Cross-Q. 46. When did you see them, and how long was it after you first saw them?

A. At Eberly's Mills, at the old clover mill there. I never saw them but one time when he operated on them. I was frequently there, but I never went for that purpose.

Cross-Q. 47. By the clover-mill, do you mean Mr. Drawbaugh's shop, where you first saw the instruments?

A Yes, sir; Mr. Drawbaugh's shop.

Cross-Q. 48. How frequently were you there?

A. I would go back and forward occasionally—every once in a while. Probably, once in a couple of weeks I was in there.

Cross-Q. 49. During what period of time did you go there, back and forth, occasionally?

A. I went there, back and forward, in 1868 and 1869. I went back and forward a good little bit.

Cross-Q. 50. And how much have you been there since 1869?

A. I ain't been there very often—not over eight or ten times in the whole time. I don't suppose I was there hardly that. I don't think that I was there that many.

Cross-Q. 51. In what years, since 1869, were those eight or ten visits, more or less, made?

A. In about the last two years back they were, the most of them, made.

Cross-Q. 52. After you saw the instruments in 1869, did you talk with any of your neighbors about them, or about the invention?

A. Yes; we used to talk about it. We thought it was a very great thing.

Cross-Q. 53. With whom did you talk about it?

A. With Mr. Frees there and Coble, as a general thing.

Cross-Q. 54. When did those talks take place?

A. It was right after the thing was completed, and had got into operation.

Cross-Q. 55. How many times do you think you talked with those men after you saw the instruments?

A. I don't hardly know. I suppose two or three different times.

Cross-Q. 56. When did you next see the instruments "B" and "F" after the first time you saw them in Drawbaugh's shop?

A. I don't know that I seen them afterwards; I can't recollect of it.

Cross-Q. 57. Did not you see them again afterwards, at any time, until you saw them here this morning?

A. Yes, sir; I seen them then once before I seen them here this morning.

Cross-Q. 58. When was that, and where?

A. They were brought to my place at White Hill. I don't remember whether it was late in the fall, or early in the spring, this last year.

Cross-Q. 59. Who brought them there?

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A. Mr. Jacobs and Mr. Drawbaugh and 'Squire Bowman were together.

Cross-Q. 60. Did you make an affidavit about them?

A. Yes, sir.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 7th day of May, 1881.
FRED. M. OTT,
Examiner.

SAMUEL NICHOLS.

Adjourned until Monday, May 9th, at 10 o'clock, A. M.

May 9, 1881, 10, *A. M.*

Examination resumed, pursuant to adjournment.

Present, Mr. Smith for complainants, and Mr. Abraham and Mr. Jacobs for respondents.

JACOB H. RENEKER, *being produced, affirmed, and examined, saith:*

Examined by Mr. Jacobs:

Q. 1. State your age, residence, and occupation.

A. Age, fifty; residence, Lower Allen township, Cumberland county, near Eberly's Mills—about three eighths of a mile from there; by occupation a farmer.

Q. 2. How long have you resided there?

A. Six years, last March—since 1875.

Q. 3. Are you acquainted with Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pennsylvania; and, if so, how long have you known him?

A. I am acquainted with him, and have known him since April, 1875.

Q. 4. Did you ever see any talking-machines at his shop, at Eberly's Mills; and, if so, when did you first see them, and under what circumstances?

A. I did see some talking-machines there, or that he called talking-machines—about May, 1875, I first saw them. I was referred there to get a clock wheel repaired. He told me to come up some time, and he would show me his talking-machine. I was in a hurry that day that he fixed the wheels for me, so I went up Sunday afternoon, and he showed them to me, and talked through them.

Q. 5. Can you tell in what part of the month of May, 1875, you got the clock wheel fixed?

A. In the beginning of May some time.

Q. 6. Who fixed it for you?

A. Daniel Drawbaugh.

Q. 7. How long after that was your Sunday afternoon visit made?

A. Probably two weeks—one week or two—I could hardly tell.

Q. 8. Is there any circumstance which fixes in your mind the time of year at which that visit was made?

A. It was about the finishing up of corn-planting.

Q. 9. Please look at these instruments, marked "B," and "F," and state whether or not you saw them at that visit.

A. Yes, sir; I saw these.

Q. 10. Same question as to instrument marked "C."

A. I think almost I did; I am not so certain of this.

Q. 11. Same question as to instrument marked "A."

A. It looks much like one that I seen at that time.

Q 12. Did he talk through "B" and "F" to you, or through other instruments?

A. He did not talk through "B" and "F."

Q. 13. Where was the instrument into which he talked, and where was the instrument at which you were listening?

A. The one he talked through was up in his room, second floor, I think it is—was then. Where I went to listen was on the next floor below.

Q. 14. When you say second floor, do you count or omit the basement as a floor?

A. I omitted the basement as a floor.

Q. 15. Can you now distinctly recollect the appearance of the instruments through which he talked and you heard?

A. I cannot. This [indicating "A"] looks like the one at which I listened.

Q. 16. Did you, or not, hear distinctly the words which Drawbaugh spoke?

A. I could hear them distinctly.

Q. 17. Do you now remember any of them?

A. Not any of the words he spoke. I remember a little song that he sang through—or one verse of it only.

Q. 18. What was that?

A. Called "Old Folks at Home," I believe it is.

Q. 19. Did you, at that time, distinguish the tune only, or the words and the tune?

A. I could distinctly understand the tune and the words, too.

Q. 20. Did he, or did he not, speak other words through the machines, besides those of the song?

A. He did, but I don't remember them.

Q. 21. Did you understand them at the time they were spoken?

A. I did; quite plain, too.

Q. 22. From the location of the machines and the intervening spaces, and floors or partitions, could you have heard what he said and sang, except through the machine?

A. No, sir; I could not.

Q. 23. Could you, or could you not, distinguish the voice which you heard as that of Daniel Drawbaugh?

A. I could not at that time, not being acquainted with his voice then yet. He was a stranger then yet to me. I had not been long acquainted with him.

Q. 24. Did it sound like that of a man, as distinguished from the voice of a woman or a child?

A. It sounded like the voice of a man.

Q. 25. Did Daniel Drawbaugh, at that time, explain to you the principle upon which his talking-machines were operated?

A. He did, but I did not understand him.

Q. 26. Did he, or did he not, say anything about the use of electricity in connection with them?

A. I am not certain of that, but think most that he did.

Q. 27. After May, 1875, and down to the summer of 1880, did you continue to visit the shop of Daniel Drawbaugh?

A. I did.

Q. 28. Frequently, or only a few times?

A. Only a few times, except 1877. I was there frequently during that year.

Q. 29. During the period embraced in my last question, did you, or not, at different times, see Daniel Drawbaugh at work upon, or experimenting with, other talking-machines than those which you saw at your Sunday afternoon visit in May, 1875?

A. I did see him working at machines, at different times, that he told me were talking-machines.

Q. 30. What called you to his shop frequently during the year 1877, as you have testified?

A. I had some little business with him that year.

Q. 31. What was the nature of that business?

A. Trying to get some money out of him, which I had loaned him.

Q. 32. When did you loan it to him?

A. In May, 1877.

Q. 33. Under what circumstances?

A. He came to the field where I was working, told me he was very hard up, and wanted me to loan him about twenty dollars for two weeks, and I gave it to him.

Q. 34. Did he repay that loan all at one time, or a little at a time?

A. Only a little at a time, on different times; but the last in March, 1878.

Q. 35. How small were the partial payments?

A. As small as three dollars, perhaps some less; I don't recollect that.

Q. 36. Please state, if you know, where he got the money to make the final payment; and, if you recollect, what he said to you at that time.

A. To make the last payment, three or four dollars, he borrowed of the store-keeper at Eberly's Mills. He said he was very hard up for money, is all that I recollect of him saying.

Q. 37. At the time you made that loan to him, was there any other transaction between you and him?

A. There was; he wanted to trade me a bureau and secretary combined on provisions, such as meat, potatoes, butter, eggs, and lard, for his family, and we traded in that way.

Q. 38. Did he, or did he not, at that time say anything about being in want of provisions for his family?

A. He did say that he needed provisions very bad for his family.

Cross-examined by Mr. Smith:

Cross-Q. 39. Are the instruments "B" and "F" in the same condition now that they were in when you first saw them?

A. I think they are, except this plaster-of-Paris, or whatever it is. There is not as much in this one [indicating the tin tube of "B"] as I thought there was then when I first seen it. The box is the same, though.

Cross-Q. 40. Did you take those two instruments in your hand at the time you first saw them?

A. Yes, sir; they looked to be a novel thing to me—was the reason that I examined them more closely than I did the other machines.

Cross-Q. 41. When was the next time that you saw the instruments "B" and "F?"

A. I cannot tell positively. Some time in the fall of 1875.

Cross-Q. 42. How often have you seen them since that time?

A. I cannot tell.

Cross-Q. 43. Have you seen them frequently during the following years?

A. Not so very frequently.

Cross-Q. 44. In what years have you seen them since 1875?

A. I cannot tell positively. I think, though, every year since 1875.

Cross-Q. 45. Did you ever make an affidavit about Drawbaugh's talking-machines? If so, when and where?

A. Yes, sir; I did—some time last winter; I don't recollect what month, though—at Etter and Shanklin's mill.

Cross-Q. 46. Was it in the winter or the fall of last year?

A. Towards spring.

Cross-Q. 47. Who was present when you made that affidavit?

A. Mr. Jacobs, and Mr. Bowman, (I don't know his first name,)—'Squire Bowman—and Mr. Condry, the miller.

Cross-Q. 48. At the time you went to Drawbaugh's shop to get your clock-wheels fixed, what did he say to you about his talking-machine?

A. He told me that time I should come up and he would show them to me. I don't recollect what all he said to me, but he told me he thought he could make it—that he could talk through it to Harrisburg.

Cross-Q. 49. Do you remember whether he said anything about what he was doing with them, or what he intended to do ultimately with them?

A. I do not remember anything more of what he said than that he thought they would take the place of telegraphing.

Cross-Q 50. At the time when you saw the instruments on Sunday, what did he say about them?

A. I do not recollect what he said about them.

Cross-Q. 51. Did you say anything to him about them?

A. I did; I don't recollect what, though, just now.

Cross-Q. 52. How long were you there at that time?

A. I cannot tell positively; perhaps three hours or so.

Cross-Q. 53. Can't you remember anything that was said, either by him or by you, about the talking-machines during that three hours?

A. I do not remember anything that he said, just now, about them at that time. I do not remember anything that I said about them.

Cross-Q. 54. How many times were you at his shop during the remainder of the year 1875?

A. Probably half a dozen times—may be more or less.

Cross-Q. 55. Did you see the talking-machines, "B" and "F," more than once, in the year 1875, after the time you saw them on Sunday?

A. Yes, sir; I did.

Cross-Q. 56. Did you see the same ones that you did on Sunday, on each of those times?

A. I don't recollect whether I saw them each time I was there.

Cross-Q. 57. At the times that you did see them, were they the same instruments that you saw on the Sunday?

A. They looked to me to be the same.

Cross-Q. 58. Did you see any change in them?

A. There may have been changes, but I don't recollect of seeing any.

Cross-Q. 59. Did you and Mr. Drawbaugh talk about the talking-machines at any of your interviews in 1875, after that one on Sunday, of which you have spoken?

A. We did. He talked and tried to explain to me about them, but I did not understand much about what he told me.

Cross-Q. 60. Is that all that you recollect that was said about talking-machines between you and Mr. Drawbaugh, in the year 1875, after the Sunday?

A. It is all I can recollect of now.

Cross-Q. 61. What business was carried on in that shop during the year 1875?

A. I don't know much about the business, except repairing machines, and, I think, working some at the faucets.

Cross-Q. 62. Was Mr. Drawbaugh accustomed to repair machinery for those who wanted it repaired?

A. He did do some little jobs, still, that I knowed of.

Cross-Q. 63. What jobs, and for whom?

A. He repaired a thresher for Mr. Bricker. I think a steam engine for Mr. Shettel, too.

Cross-Q. 64. Can you think of any other jobs that he repaired?

A. No, I don't just now.

Cross Q. 65. Did you see, from time to time, a good many jobs of repairing being done at his shop?

A. I did not. I was not there very often, and so did not know what he was doing.

Cross-Q. 66. How often were you there during the year 1876?

A. Not very often. I can't say just how many times that year.

Cross-Q. 67. State, as nearly as you can, how many times you were there during the year 1876.

A. Probably five or six times, as near I can tell.

Cross-Q. 68. What business was being carried on there during that year?

A. About the same as before, as near as I can tell.

Cross-Q. 69. Did you see some repairing of machinery being done?

A. Some little. Seen them turning off some mill-spindles. I don't recollect of anything else they were doing.

Cross-Q. 70. How many times during the year 1876 did you see the machines "B" and "F?"

A. I cannot tell how often I saw them that year.

Cross-Q. 71. Did you see them more than once?

A. I cannot say. I may have seen them oftener and may not.

Cross-Q. 72. When you saw them, did you also see the other talking-machines which you saw on the Sunday?

A. I did see a lot of machines, but could not distinguish them so well as these, ["B" and "F."]

Cross-Q. 73. Do you think that you saw more machines that Drawbaugh said were talking-machines in 1876 than in 1875?

A. I cannot say that I did. I do not recollect much about them.

Cross-Q. 74. Do you recollect whether or not in 1876 you saw the machine marked "A," or one like it?

A. It looks very much like the machine I saw in 1876.

Cross-Q. 75. Did you, at any time in 1876, have any talk with Mr. Drawbaugh about the talking-machines?

A. I do not recollect of any; I may have had, though.

Cross-Q. 76. How came you to see the machines in 1876, and where were they?

A. They were in his room upstairs. I was in once or twice that he was working or studying at them, in 1876. I was not there often that year.

Cross-Q. 77. Did not he say anything about what he was doing on them or studying about?

A. Not that I recollect, as he was so busy, and we did not have much conversation about them.

Cross-Q. 78. You don't remember anything which you said to him about them in that year, do you?

A. I do not.

Cross-Q. 79. In 1877, when you were at his shop quite frequently, what business was being carried on?

A. I think about the same as before. May, perhaps, have been working at the clocks. Cannot tell for certain, though.

Cross-Q. 80. Do you recollect whether the spindle business or the faucet business was being carried on that year?

A. I do not. I did not stay there any length of time to see what was doing.

Cross-Q. 81. Was Mr. Drawbaugh generally doing something when you went there, or doing nothing?

A. He always appeared very busy when I was there.

Cross-Q. 82. Can't you tell what he was busy about?

A. He was studying about machines that I knowed nothing at all about, and working at them.

Cross-Q. 83. How many times did you see the machines "B" and "F" during that year?

A. I do not recollect how often I did see them.

Cross-Q. 84–5. Did you see them more than once, do you think?

A. I am not able to say. I may have seen them once, and perhaps oftener. I am not able to say.

Cross-Q. 86. Did you see them in the same place that you did in 1876?

A I don't recollect whether I did. They were changed around some.

Cross-Q. 87. Did you see, in 1877, any talking-machines there, besides those which you saw in 1875 and 1876?

A. I think there was some more.

Cross-Q. 88. How many more do you think?

A. I cannot say.

Cross-Q. 89. How came you to see them?—I mean the additional ones.

A. I saw them on his table—bench—when he was working on them—different machines.

Cross-Q. 90. What was he doing on them?

A. I cannot tell what. Working at them something—studying at them.

Cross-Q. 91. Did he say anything about them?

A. He did, sometimes.

Cross-Q. 92. What did he say?

A. I think about that time he told me that he could run them a longer distance.

Cross-Q. 93. Did he mention what distance?

A. Not that I recollect any more.

Cross-Q. 94. Did he say anything else about them at times when you saw them in 1877?

A. Not that I recollect about; he may have spoken about them, though.

Adjourned for dinner, until 2.15, P. M.

May 9, 2.15 *o'clock*, P. M.

Examination resumed, pursuant to adjournment.

Same counsel present.

Cross-Q. 95. Do you remember how the new machines, which you saw Drawbaugh working on in 1877, looked?

A. No, sir; I do not.

Cross-Q. 96. Do you remember whether they were shaped like "B" and "F," or more like "A?"

A. They were shaped more like "A," I think; some smaller.

Cross-Q. 97. Do you think they were round and thin, like "A?"

A. I think they were round and some thicker.

Cross-Q. 98. Did you say anything to him then—ask him any questions about them?

A. I do not recollect whether I did or not.

Cross-Q. 99. You have said that he was studying upon the machines. How did you know that he was studying upon them?

A. He told me that he was working at them.

Cross-Q. 100. Did he tell you anything about what he was trying to do?

A. Nothing more than making or working at his talking-machine or machines.

Cross-Q. 101. Did you ask him why he was working at them, or what he was trying to do?

A. No, sir; I did not.

Cross-Q. 102. How often were you at his shop in 1878?

A. I cannot say positively, but not very often.

Cross-Q. 103. What do you mean by that?

A. I don't—I was not there, I don't suppose, more than four or five times.

Cross-Q. 104. Did you go there any more during that year, after he paid you the last money in March?

A. I do not recollect whether I did or not.

Cross-Q. 105. What business did you see carried on there in 1878?

A. Not anything different from other years.

Cross-Q. 106. Did you see anything that year of the spindle business, the clock business, or the faucet business?

A. I don't recollect as I did.

Cross-Q. 107. How many times did you see the instruments "B" and "F" during that year?

A. I do not recollect.

Cross-Q. 108. Did you see any talking-machines there in that year that you had not seen before?

A. I don't think I did.

Cross-Q. 109. Did you hear, during the year 1877 and 1878, anything said by Mr. Drawbaugh, or among the neighbors, about an electric or magnetic clock which he had invented, and which would run without being wound up?

A. I did hear of such a clock, but do not know what years it was in.

Cross-Q. 110. Did you see any of those clocks?

A. I seen a clock there that they said would run without winding up.

Cross-Q. 111. Can not you tell when you saw that clock?

A. No, sir; not positively.

Cross-Q. 112. State, as nearly as you can, when it was.

A. It may have been some time between 1876 and 1878 or '9. I can't tell what year.

Cross-Q. 113. Did you see more than one such clock there?

A. No, sir; I did not.

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Cross-Q. 114. How many instruments, shaped something like the instrument "A," but smaller, did you see in the year 1877?

A. I don't recollect—perhaps three.

Cross-Q. 115. Did you see them in 1878, at the same time or times that you saw "B" and "F"?

A. No, sir; I did not see them all together.

Cross-Q. 116. Did you see the smaller instruments at any time in 1878 which you saw Drawbaugh working on in 1877?

A. I do not recollect of seeing them in 1878.

Cross-Q. 117. Did you see them in 1879?

A. I don't recollect what years—1879 or 1880.

Cross-Q. 118 Did you see any talking instruments at Drawbaugh's shop in 1879 which you had not seen before?

A. Not that I recollect of now.

Cross-Q. 119. Did you have any talk with him about such instruments in 1879?

A. I cannot say now whether I had or not.

Cross-Q. 120. What business was carried on in his shop in 1879?

A. I do not know of anything different from what had been, as I had only been there a few times, and a very short time.

Cross-Q. 121. Do you know whether either the spindle business, or the clock business, or the faucet business was carried on there in 1879?

A. I do not know.

Cross-Q. 122. Do you know whether Mr. Drawbaugh was working or studying on talking-machines in 1879?

A. I do not recollect of seeing him at them in 1879.

Cross-Q. 123. Did you see any talking instruments after 1879 which you had not seen before?

A. No, sir; I did not.

Cross-Q. 124. At the time when you gave your affidavit, did Mr. Jacobs, or either of the other persons present, tell you what it was wanted for?

A. No, sir; not that I recollect of now.

Re-direct by Mr. Jacobs:

Q. Q. 125. You have been asked about the spindle or axle business. Do you remember of that business being carried on in the shop in which Daniel Drawbaugh worked by Bear, Kline, Moore, and Grove?

A. I believe it was carried on by some parties, in the spring of

1875, about the time I got the clock-wheel repaired. I did not know much about it, though.

Q. Q. 126. Were your visits to the shop generally very brief or protracted ?

A. Very brief, except the second visit. I spent considerable time there that time.

Q. Q. 127. Do you refer to the Sunday afternoon visit, when you first saw the talking-machines?

A. That is the time I have reference to.

Q. Q. 128. When you went to that shop, whom did you generally go to see?

A. Daniel Drawbaugh, about them times.

Q. Q. 129. When you had transacted your business with him, did you look around in the shop to see what business was carried on by others than Mr. Drawbaugh.

A. No, sir; I did not.

Q. Q. 130. Do you remember the fact of Mr. Drawbaugh's moving his family from Eberly's Mills to Mechanicsburg?

A. I do.

Q. Q. 131. Was the Sunday afternoon visit, during which time you saw the talking-machines, before or after that removal?

A. Before.

Re-cross by Mr. Smith:

Re-cross-Q. 132. What business did you have with Mr. Drawbaugh in the latter part of 1875 and 1876 that led you to visit him?

A. Nothing particular. I did not visit him often them years.

Re-cross-Q. 133. Why did you visit him in 1878 and 1879?

A. I do not recollect the particular business either of them years.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to this 9th day of May, 1881, before me.

FRED. M. OTT,
Examiner.

JACOB H. RENEKER.

JOHN WEBER, *being produced, affirmed, and examined, saith:*

Examined by Mr. Abraham:

Q. 1. State your age, residence, and occupation.

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A. I am fifty-one years old; reside in Hampden township, Cumberland county, Pennsylvania; I am a farmer.

Q. 2. Are you acquainted with Daniel Drawbaugh, of Eberly's Mills; sometimes it is called Milltown? If so, how long have you known him?

A. Yes, sir; I know the Milltown, and I know Drawbaugh from boyhood up.

Q. 3. Did you visit his shop in the year 1874?

A. Yes, sir.

Q. 4. What time of the year, and what conveyance did you go in?

A. About the latter end of December. I went in a sleigh.

Q. 5. What was the object of your visit in the latter part of December, 1874?

A. To ask whether he could make me a pitman connection on my reaper, for the sickle-bar, to my notion that I had to have it made.

Q. 5½. While you were there at that visit, did Mr. Drawbaugh show you any particular inventions of his? If so, describe those that he exhibited to you.

A. Yes, sir; he showed me a clock, that he called electricity clock, that he said he made. He also said it would run without being wound up, and then I said, "Daniel, you have always been a great genius, but never made much money by all your trouble." He said, "I have invented a great many machines, such as telegraph," then showed me that he could telegraph by writing on a silver paper—tin paper—and put that to the wire, and it would write the same at the other end. Then he said, "I have a talking-machine, that beats all the others of my inventions." Then he showed me some fixings for talking in. Now they—here is machines—[indicating "F."] This he showed me, and he said, "There you talk in, and at the other end there is one, that you must hold to your ear, to hear what was talked." I said, "Daniel, that is wonderful." Then he wanted me to go down stairs and he would talk to me, through this machine, [indicating "F,"] but I had no time to spare.

Q. 6. Did you ever see the instrument I now show you, marked "B?". If so, state when and where?

A. Yes, sir; I saw it the same day in the latter end of December, 1874, in his office, behind the door, in a kind of closet that he had.

Q. 7. Did it have any wire or wires attached to it?

A. I thought it was a string—he said it was wire wrapped like the old-fashioned bonnet wire—that ran down to the lower story of the building.

Q. 8. Were those two instruments both in the same closet, or where were they situated, respectively?

A. Those two were in the same closet; this [indicating "B"] and this [indicating "F"].

Q. 9. Do you recognize any of the other instruments on the table before you as having been seen by you at that time?

A. Yes, sir: here is one [indicating "A"] that I seen that very time.

Q. 10. Did Mr. Drawbaugh tell you what that was to be used for?

A. Yes, sir; he said that you must have it to receive what is talked; in this machine, [indicating "F"] he said, they talk into.

Q. 10½. Did either of you handle that machine "A?" If so, what did you do with it?

A. I just looked at it.

Q. 11. Did Mr. Drawbaugh place it in any position?

A. Yes, sir; he held it to his ear. He said that is the way to talk.

Q. 12. In what part of the building was that instrument "A," at that time?

A. Right in his office, above his work-bench.

Q. 13. Do you recollect having seen this instrument "C?"

A. I recollect seeing it.

Q. 14. Did Mr. Drawbaugh tell you the purpose for which that was intended, or what it was at all?

A. Yes, sir; he did. To talk in.

Q. 15. Which one of all the inventions and devices that Mr. Drawbaugh exhibited to you at that time made the most forcible impression on your mind?

A. All those machinery that he has here—talking-machines.

Q. 16. Did you, after you left his shop on this occasion, study and think over what he had said to you concerning conveying sound from place to place?

[*Objected to by Mr. Smith as leading.*]

A. Yes, sir; I did. I told my brother-in-law that Daniel Drawbaugh had got up a talking-machine. I thought it was a wonderful thing. That I told to my brother-in-law, Harry Springer.

Cross-examined by Mr. Smith:

Cross-Q. 17. Did you reside in 1874 where you now do?

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A. Yes, sir.

Cross-Q. 18. How far is that from Drawbaugh's place?

A. We call it six miles.

Cross-Q. 19. Were you accustomed, before that time, to go to his shop from time to time?

A. No, sir.

Cross-Q. 20. Were you never there before?

A. Not the time he carried on the works, or rather not the time that he worked there.

Cross-Q. 21. Have you ever been there since?

A. Yes, sir.

Cross-Q. 22. How many times, and when?

A. Twice; the couple of last days in December, 1874, between the holidays, and then the latter end of January, 1875.

Cross-Q. 23. Was this instrument "F" in the same condition when you saw it that it is now?

A. Yes, sir; I think it was.

Cross-Q. 24. Was the instrument "B" in the same condition?

A. There was something wrapped around this here [indicating "B"] somewhere. It looked like a hog bladder, or something like that, fastened around here [indicating the rim of "B," next to the magnet.]

Cross-Q. 25. Have you stated all that Drawbaugh said to you, and you to him, at the time he showed you these machines?

A. I recollect that he said he could carry sound as far as Shiremanstown, or rather talk as far as Shiremanstown.

Cross-Q. 26. When did you next see these machines?

A. Last summer.

Cross-Q. 27. Who showed them to you?

A. Mr. Drawbaugh and this gentleman [indicating Mr. Abraham].

Cross-Q. 28. Had you talked to Mr. Drawbaugh about them before that time, and since the time you saw them before?

A. No, sir; not concerning the talking-machine.

Cross-Q. 29. How often had you seen him, after the time you first saw the instruments, and before you next saw them?

A. Probably five times.

Cross-Q. 30. When did you talk to Mr. Springer about them?

A. In the latter end of December, 1874.

Cross-Q. 31. Did you ever talk with anybody else about them before last summer?

A. Nobody, but to my family at home.

Cross-Q. 32. Did you make an affidavit concerning them last summer or fall?

A. No, sir.

Re-direct by Mr. Abraham:

Q. Q. 33. Did not you refuse to testify in this case unless you were brought before an Examiner of the court on a subpœna?

A. Yes, sir.

Q. Q. 34. You have spoken in your cross-examination of two visits, in the winter of 1874–'5, to Mr. Drawbaugh's shop, subsequent to the one mentioned in your examination-in-chief. Please state how long you were in Mr. Drawbaugh's shop on these last two visits.

A. Probably half an hour at each time.

Q. Q. 35. How were you occupied during those two visits?

A. Just in his office, asking him whether he had my reaper connection finished.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 9th day of May, 1881.

FRED. M. OTT,
Examiner.

JOHN WEBER.

JOHN H. STEPHEN, *being produced, affirmed, and examined, saith:*

Examined by Mr. Jacobs:

Q. 1. State your age, residence, and occupation.

A. Forty-nine years; reside in Hampden township, Cumberland county, near Shiremanstown; occupation farming.

Q. 2. Are you acquainted with Daniel Drawbaugh, of Eberly's Mills, Cumberland county; and, if so, how long have you known him?

A. I have known him ever since I was a boy. We were raised within half a mile.

Q. 3. Have you ever seen any talking-machines at the shop in which he worked, at Eberly's Mills; and, if so, when, to the best of your recollection and belief, did you first see them?

A. Before 1875. I can remember very well. I might say 1870, but I am not certain on that. I visited Daniel Drawbaugh's shop from 1870 on.

Q. 4. To the best of your recollection and belief, how long before 1875 was it?

A. I wouldn't positively say just—I am not certain of the date—from 1875. It was before 1875. I am certain of that.

Q. 5. Please look at instruments marked "B" and "F," and state whether or not they are instruments which you saw at the shop in which Daniel Drawbaugh worked, at Eberly's Mills, before 1875.

A. I saw both of these before 1875. I am certain of that. I might have saw them in 1870, but I would not be qualified to that.

Q. 6. Who showed them to you?

A. Daniel Drawbaugh.

Q. 7. Did he tell you what they were for?

A. I asked him what he was working on now, and he told me different things; and he got this tumbler ["F"] and said he was working on a talking-machine, and explained it to me. He had this here ["B"] along, too, and some other things I don't just remember. He explained it to me, and, of course, I did not understand it, and I just laughed at it.

Q. 8. Where were the instruments when you saw them?

A. Second floor in his shop.

Q. 9. When he explained them to you, did he say anything about the use of electricity in connection with them?

A. Yes, sir; and wires.

Q. 10. Did you see any wires?

A. He got a piece of wire, and was showing me how it worked, you know. I don't remember whether it was here [indicating electro-magnet of "B"] or where.

Q. 11. Do you remember whether those coils of wrapped wire were upon the instrument marked "B," at the time you first saw it?

A. Yes, sir; they were.

Q. 12. Did he, or not, show you any batteries in connection with the instruments?

A. Yes, sir; he did.

Q. 13. Did he tell you what the instruments were for?

A. He said for a talking-machine he was getting up.

Q. 14. Did he, or did he not, say that they were intended to talk to a distance?

[*Objected to by Mr. Smith as leading.*]

A. Yes, he said they were to talk the same as you can telegraph, you know, in place of writing or making dots.

Q. 15. Please look at instrument "C," and state when, to the best of your recollection, you first saw it.

A. I could not positively tell when I first saw this one. I saw it, but I couldn't state when.

Q. 16. To the best of your recollection, did you see it before or after the year 1875?

A. I am not positive on that. I think it was after 1875. I saw it, I am certain, in 1876. I saw so many, you see, I am not positive.

Q. 17. Please look at the instruments marked "D" and "E," and state, to the best of your recollection, when you first saw them.

A. About 1875; in 1875. I remember this very well—this ring on [indicating the curled magnet on "D"].

Q. 18. Did you speak to any one about Drawbaugh's talking machines soon after you first saw them?

A. Yes, sir; I still went home and told them at home, and different ones I spoke to, and took some down to see his inventions that he was working on.

Q. 19. I refer to the occasion upon which you first saw the talking-machines "B" and "F." Did you, soon after that, speak to any one about them, at home or to strangers?

A. I did. I told them at home as soon as I got home. I went down there. Sometimes it was ten o'clock after night when I got home. They were wondering where I stayed so long. I told them when Dan was through with my work, he got to showing me his patent-rights, and told them what he was working at.

Q. 20. Did you, or not, tell them about the talking-machines which you had seen at Drawbaugh's shop?

A. Yes, sir; I told them about the clock, machine to wrap wire, and different other little things that he was working at.

Q. 21. What members of your family did you tell about Drawbaugh's talking-machines at that time?

A. I told my wife, two daughters, and hireling.

Q. 22. Subsequently to 1875, did you visit the shop at Eberly's Mills in which Daniel Drawbaugh was working?

A. I did; sometimes twice a day, and sometimes two or three times week.

Q. 23. Every year?

A. Every year. Sometimes I missed for a couple of months that I did not get there—from 1870 on up to this time.

Q. 24. Did you, or did you not, see at different times, between 1875 and the summer of 1880, other talking-machines which you had not seen before?

A. I saw Dan talking through this machine in 1880. I did not, previous to 1880, see other talking-machines which I had not seen before.

Q. 25. When you say "this machine," do you mean any of the machines concerning which you have already testified, or do you mean simply that he talked through *a* talking-machine?

A. I mean what I testified to. No, sir; it was something with two wires attached to it that I put to my ear. It was after night when he talked through it.

Adjourned until 9.30, A. M., May 10.

May 10, 9.30, A. M.

Examination resumed.

Present, same counsel.

Cross-examined by Mr. Smith:

Cross-Q. 26. How far do you live from Mr. Drawbaugh's shop?

A. About three miles.

Cross-Q. 27. Have you lived at the same place since 1870?

A. Yes, sir.

Cross-Q. 28. What kind of an instrument was it that you talked through in 1880?

A. Well, I didn't see the machine where he talked in. I was upstairs, and it was after night. It was a machine I held to my ear, with a couple of wires attached to it.

Cross-Q. 29. When you first saw the machines marked "B" and "F," were they in the same condition they are in now?

A. As near as I can remember, they were.

Cross-Q. 30. Did you see them often between the time you first saw them and 1880?

A. Yes, sir; I seen them often. They were laying on the benches around there.

Cross-Q. 31. You never noticed, I suppose, any difference in them after you first saw them?

A. No, sir; I never noticed anything different—never took particular notice about them.

Cross-Q. 32. Will you now look at the instruments put on the table, and see if you can find the instrument you listened to in 1880, or one like it?

A. I ain't certain, there are so many here, and I didn't take particular notice, but it was something that had two wires to it—something like this [holding up instrument "M."]

[*The instruments on the table are* "*A,*" "*B,*" "*C,*" "*D,*" "*E,*" "*F,*" "*G,*" "*I,*" "*K,*" "*L,*" "*M,*" "*N,*" *and* "*O.*"]

Cross-Q. 33. At the time when you listened to the instruments, in 1880, what did Mr. Drawbaugh say about the instruments, or about the talking-machines?

A. He said he could talk a distance with it—any distance, I think he said.

Cross-Q. 34. What other things, besides talking-machines, did you see at Drawbaugh's shop from 1870 to 1880? I mean things that he invented.

A. Well, I saw a clock, and different other little things that he was working on; a machine to wrap wire. That is about all that I know. He had a great many little knick-knacks there, that he showed.

Cross-Q. 35. Do you know whether he got patents on any of the things which he had invented? If so, on what ones, that you remember?

A. I don't remember on what ones. I know he got on some. I never asked him.

Cross-Q. 36. Have you ever made an affidavit concerning what you know about the talking-machine?

A. Yes, sir.

Cross-Q. 37. When did you make it?

A. From paper now shown me, I am satisfied the date was March 1, 1881.

Cross-Q. 38. Where were you when you made that affidavit, and who was present?

A. At home. Mr. Jacobs, Harry Bowman, justice of the peace, and Daniel Drawbaugh were present.

Cross-Q. 39. Did Mr. Jacobs tell you what he wanted the affidavit for?

A. Yes, sir; I think he told me what it was for.

Cross-Q. 40. What was it for?

A. He said there was another company claimed it, and they were

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trying—at any rate it was, they were going to try to see what they could do with the other company—that Daniel claimed it, you know.

Re-direct by Mr. Jacobs:

Q. Q. 41. Were you visited by Mr. Drawbaugh and myself, with relation to this matter, before the time when your affidavit was taken?

A. Yes, sir; four or five times.

Q. Q. 42. Please state whether, at our first visit, some time last summer, you did not describe to us instruments "B" and "F" before we showed them to you, particularly the tin box with the coils of wrapped wire.

A. I did.

Re-cross by Mr. Smith:

Re-cross-Q. 43. Did you make an affidavit last summer or fall about them?

A. No, sir; I did not, when they came to see me, for the very reason that I did not want to have my time taken up by calculating to come to this. That was the very reason. They came to me five or six times.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 10th day of May, 1881.

FRED. M. OTT,
Examiner.

JOHN H. STEPHEN.

EZEKIEL WORLEY, *being produced, affirmed, and examined, saith:*

Examined by Mr. Abraham:

Q. 1. State your age, residence, and occupation.

A. My age is seventy-one; residence, Lower Allen township, Cumberland county; occupation, farming.

Q. 2. Are you acquainted with Daniel Drawbaugh, of Eberly's Mills, sometimes called Milltown?

A. Yes, sir.

Q. 3. How long have you known him?

A. I suppose thirty-five years. He was a small boy yet, when I knew him.

Q. 4. Are you acquainted with Mr. Jacob R. Miller, of Miller s Mill ?

A. Yes, I am acquainted with the man that you have reference to, but he don't live at Miller's Mill.

Q. 5. Where does Mr. Miller now live?

A. At Shiremanstown.

Q. 6. Where did he formerly live?

A. At the mill—Miller's Mill.

Q. 7. Do you know when Mr. Jacob R. Miller moved away from Miller's Mill? If so, please state.

A. He moved away from there eight years ago this last spring.

Q. 8. Did you have any transaction with Mr. Miller, regarding lumber or logs, prior to his removal from Miller's Mill?

A. Yes, sir.

Q. 9. Please relate the transaction, and any particular circumstance that you remember in relation thereto.

A. I had sold him some lumber—some logs—that he bought and sawed up.

Q. 10. Did you deliver to him all that you sold? If not, state the reason wherefore.

A. I delivered him all that I sold him, and more, too. Some he did not use; did not take them off my hands. The oak he used, and the hickory he did not.

Q. 11. Were any of your logs carried away by a freshet about this time?

A. There was one of them the water took away, the creek getting high.

Q. 12. Did you discover this lost log soon after. If so, where?

A. It was some time after, but I could not tell you how long. It might have been two or three months, and may not have been more than a month; as far as that is concerned, I could not tell how long it was. I discovered it on the bank of the creek, above his factory, at Milltown, as they call it.

Q. 13. Whose factory do you mean?

A. I don't know who owns it at the present time. It was called the Milltown factory, or pump or faucet factory. For my part, I don't know who are the owners of it.

Q. 14. Do you mean the building at Eberly's Mill that used formerly to be known as the clover-mill?

HONE COMPANY,-1

A. It used to be a clover-mill, I believe. They used to grind plaster there, too, I believe.

Q. 15. Was anybody with you when you discovered this lost log? If so, please state who it was.

A. Mr. Taylor was along with me.

Q. 16. Did you go into the mill with Mr. Taylor?

A. Yes, sir; we went in together.

Q. 17. Now state whom you saw in the mill, and what transpired there.

A. We saw Mr. Daniel Drawbaugh. That is too difficult for me to tell what transpired there. We were looking at his machinery—his different things—his clocks that he had invented, run by telegraph—or not by telegraph, but by electricity—and a good many things; I can't just tell you what all. For he was a man that had a great many notions agoing among the rest his telephone—talking-machine, as we called it at that time, telling about it.

Q. 18. Did he show you any of his instruments belonging to his talking-machine?

A. He showed some things there, that he said belonged to it; but he didn't talk any through it, that I recollect of now.

Q. 19. Did he explain to you anything regarding the manner in which it was operated?

A. He talked about working it upon the principle of telegraphy. That was his idea.

Q. 20. Would your memory serve you to identify and recognize any of the instruments relating to his talking-machine that he showed you at that time, if they were now presented to you for examination?

A. No, sir.

Cross-examination waived by Mr. Smith.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 10th day of May, 1881.

FRED. M. OTT,
Examiner.

EZEKIEL WORLEY.

HENRY N. SHOOP, *being produced, affirmed, and examined, saith:*

Examined by Mr. Jacobs:

Q. 1. State your age, residence, and occupation.

A. Age, thirty-three; residence, Camp Hill; occupation, carpenter.

Q. 2. Are you acquainted with Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pennsylvania, and if so, how long have you known him?

A. I am acquainted with Mr. Daniel Drawbaugh for fifteen years, or more.

Q. 3. Did you ever see any talking-machines at the shop in which he worked, at Eberly's Mills: If so, when did you first see them, and under what circumstances?

A. I saw one in the latter part of August, 1873. I was secretary of the band at the time. There was to be a picnic at Milltown—a Sunday-school picnic—and I was one of the committee to see the Sunday-school committee about hiring the band. I went in with Hiram K. Drawbaugh, and I went into the machine-shop, and he showed me the—talking-machine it was called.

Q. 4. Do you remember the appearance of the talking-machine which you then saw?

A. I remember a tumbler with the bottom knocked out.

Q. 5. [Mr. Jacobs now hands witness instrument marked "F."] Does that look like it?

A. Yes, sir; it does.

Q. 6. Was there but the one instrument—the glass tumbler?

A. That is all I saw at that time.

Q. 7. Was the instrument explained to you at that time?

A. I was told it worked by a battery, or electricity.

Q. 8. Who told you so?

A. H. K. Drawbaugh.

Q. 9. Did he tell you who had made the talking-machine?

[*Objected to by Mr. Smith as hearsay.*]

A. Yes, sir; his Uncle Dan.

Q. 10. Was Daniel Drawbaugh at the shop at that time?

A. No, sir.

Q. 11. Where did you then reside?

A. At Camp Hill.

Q. 12. State whether or not you afterwards moved to Eberly's Mills. If so, when, and how long did you reside there?

A. I moved there in February, 1877, and moved away in November, 1877.

Q. 13. Whilst residing there, did you visit the shop in which Daniel Drawbaugh worked?

A. Yes, sir.

Q. 14. How soon after you moved to Eberly's Mills did you make your first visit to the shop?

A. In a day or so. I went there to grind some tools.

Q. 15. Please state whether or not you then and there saw other talking-machines which you had not seen before.

A. I did. I saw several that I had not seen before. Some were finished and some not finished.

Q. 16. Please look at instruments marked "D" and "E," and say whether or not you saw them there at that time.

A. That one I saw, [indicating "D,"] or one very much like it. I was attracted by that iron on the bottom [pointing to curled magnet on bottom of instrument "D."] I asked Mr. Drawbaugh what that was intended for. He told me that it belonged to his talking-machine.

Q. 17. Was that machine finished or unfinished when you saw it there on that occasion?

A. I think it was as it is now, finished.

Q. 18. Do you remember the appearance of any of the instruments which you saw there at that time in an unfinished state?

A. I saw him working on cups like these [pointing to mouth-piece of instrument "D" that were not finished.]

Q. 19. On one or more than one?

A. One or so. He was working at one or so on his bench. There was more than one.

Q. 20. How many finished instruments did you see there at that time?

A. That is more than I can tell. I did not examine them all.

Q. 21. More than one?

A. Yes, sir.

Q. 22. Did you make other visits to that shop during your visit to Eberly's Mills?

A. Yes, sir.

Q. 23. Please state whether or not, during those visits, you saw Daniel Drawbaugh at work upon talking-machines.

A. I can't remember exactly of his being at work on talking-machines. I have often seen things lying on his bench that belonged to it, but whether he was at work at the time or not I could not tell.

Q. 24. Do you mean by that that you do not now remember?

A. I do.

Q. 25. Have you been at that shop since you moved away from Eberly's Mills in November, 1877?

A. I have not.

Cross-examined by Mr. Smith:

Cross-Q. 26. When you moved away from Eberly's Mills, did you move to your present residence?

A. I did; yes, sir.

Cross-Q. 27. How far is that from Drawbaugh's shop?

A. About two miles.

Cross-Q. 28. When you saw instrument "F," in 1873, was it in the same condition as it is now?

A. It was, as far as I can remember.

Cross-Q. 29. At the time you first saw instruments at Drawbaugh's shop in 1877, where were they—I mean in what part of the shop?

A. Some were in the draft room. Some on the bench where he was working.

Cross-Q. 30. What did he say to you about them at that time?

A. I asked him whether it would work. He said he had it in working order. Yes, sir.

Cross-Q. 31. Was that all he said about them, that you can remember?

A. Yes, sir; it was.

Cross-Q. 32. Do you remember how long you looked at the instruments at that time?

A. A short time. I had to go to work in the afternoon, and I was in a hurry.

Cross-Q. 33. At any of your subsequent visits to the shop, when you saw talking-instruments, did you have any talk with Drawbaugh about them?

A. Not in particular. No, sir; I never went there unless on business.

Cross-Q. 34. Did you, at any time during the next two or three years after you moved away, talk with him about them?

A. No, sir; I saw him very little after I moved away from there.

Cross-Q. 35. Have you made an affidavit relating to the talking-machines? If so, when and where?

HONE COMPANY,-1

A. I have. I think it was in February, in 'Squire Bowman's office. From a paper shown to me by Mr. Jacobs, I fix the date as February 9, 1881.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 10th day of May, 1881.
FRED. M. OTT,
Examiner.

H. N. SHOOP.

May 11, 1881, 10 *o'clock*, A. M.

Examination resumed, pursuant to adjournment.

Present, Mr. Smith for complainants, and Mr. Abraham and Mr. Jacobs for respondents.

RUFUS K. SHIREMAN, *being produced, affirmed, and examined, saith:*

Examined by Mr. Abraham:

Q. 1. State your age, residence, and occupation.

A. Age, twenty-eight years; residence, Shiremanstown; occupation, painter.

Q. 2. Are you acquainted with Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pennsylvania?

A. I am.

Q. 3. How long have you known him?

A. I may say ever since I was able to recognize or remember the name of any one.

Q. 4. Have you frequently visited the shop where he has been working, from time to time, at Eberly's Mills?

A. I did.

Q. 5. At any of these visits, did he speak to you about a talking-machine that he said he had invented?

A. Yes, sir.

Q. 6. How long ago was the first time?

A. Not less than eight years.

Q. 7. Can you fix the year, and the time of the year? If so, please do so.

A. It was in the fall of the year, but whether it was in the year 1872, or not, I could not say.

Q. 8. Did he, at that time, show you any instruments that he said belonged to his talking-machine?

A. He did.

Q. 9. Please look at instruments "B" and "F," now shown you, and state whether you ever saw those before.

A. I did.

Q. 10. Did you see them at the time of this visit, concerning which you have testified?

A. I did.

Q. 11. Please state in what part of the building they were respectively located when you saw them at that time.

A. North-eastern part. They were both there.

Q. 12. Did Mr. Drawbaugh explain to you on what principle they were operated? If so, please state what he told you.

A. By magnetism.

Q. 13. Did he state what he could accomplish by means of these instruments?

A. Yes, sir.

Q 14. What did he say he could do with them?

A. Convey the voice or sound to a great distance.

Q. 15. Did he speak through them to you, or in your presence, on that occasion?

A. No, sir.

Q. 16. When did you next visit Mr. Drawbaugh's shop?

A. I could hardly give the correct time. Somewhere in about three months.

Q. 17. Then this second visit of yours was not more than four months after your first one, was it?

[*Objected to by Mr. Smith as leading.*]

A. No, sir.

Q. 18. At this second visit, did Mr. Drawbaugh again show to you his talking-machines?

A. He did.

Q. 19. Did you then see again these instruments "B" and "F?"

A. I did.

Q. 20. Did you see any other instruments besides these two?

A. I did.

Q. 21. Did Mr. Drawbaugh operate any of these instruments in your presence?

PHONE COMPANY,-1

A. He did.

Q. 22. Now state what he did, if you please.

A. Spoke through them to me.

Q. 23. Where were you and where was Mr. Drawbaugh when he spoke to you through his talking-machine?

A. I was in the room on the second floor in the north-east corner of the building. I could not say in what part of the building he was in.

Q. 24. Could you see him while he was speaking to you through the instrument?

A. I could not.

Q. 25. In what position were you and in what position was the instrument through which you heard?

A. The instrument was fastened against the north wall of the building; I was standing.

Q. 26. How near were you to the instrument through which you heard?

A. Very close to it.

Q. 27. Did you understand distinctly the words that reached your ear?

A. I did.

Q. 28. Did you recognize the language as being in the voice of any particular person? If so, whose voice did you recognize?

A. I did—Mr. Drawbaugh's.

Q. 29. Besides recognizing the voice of Mr. Drawbaugh, did you correctly and distinctly hear the spoken words through the opening of the instrument near which you were then standing?

[*Objected to by Mr. Smith as leading.*]

A. I did.

Q. 30. Did you see any connections attached to the instrument through which you were listening?

A. Not more than wire.

Q. 31. Did you follow with your eye the course the wire took that was attached to this instrument?

A. Yes, sir.

Q. 32. Now state in what direction you saw this wire led.

A. It run from the machine towards the ceiling, and then a westerly course, I may say, along the angle of the room, upon the ceiling.

Q. 33. What kind of wire was this?

A. It was a wire wrapped with white cord, or cotton, or something of the kind.

Q. 34. You have stated, in reply to a former question, that the interval between these two visits, concerning which you have testified, was somewhere about three months. Are you not able to fix a limit definitely of the longest time that elapsed between these two visits?

A. I am not.

Q. 35. Are you sure it was within six months?

A. I am.

Q. 36. Did you visit Mr. Drawbaugh's shop after this second visit, during the past seven and a half years?

A. I did.

Q. 37. About how frequently?

A. I could not say.

Q. 38. During these subsequent visits, has Mr. Drawbaugh exhibited to you any other instruments which he said belonged to the talking-machine, besides the two, "B" and "F," concerning which you have testified?

A. He did.

Q. 39. Now, please examine the various instruments spread upon the table, and see whether you have seen any of them, at any of the subsequent interviews you have last referred to?

A. I have. I have seen this instrument marked "E," this one "A," also "I" and "D." I don't remember seeing any more.

[*The remaining instruments on the table are* "*G,*" "*J,*" "*K,*" "*L,*" "*M,*" "*N,*" *and* "*O.*"]

Q. 40. Which, among these four which you have selected, did you see at the earliest period?

A. I could not say.

Q. 41. In your answer to question 39, after having selected four instruments and identified them, you say: "I do not remember of having seen any more." Do I understand you to say that you did not see any more instruments, or that you do not identify any more of those spread before you?

A. I do not identify any of those spread before me.

Q. 42. Did you see, at these subsequent visits, any more instruments, besides those identified, that Drawbaugh told you belonged to his talking-machines?

A. I can't remember.

Q. 43. Did you in any of your visits, subsequent to the year 1872, see Mr. Drawbaugh working on any instruments that he said belonged to his talking-machines?

A. I did.

Q. 44. What, if anything, did he say to you that he was doing with his talking-machines?

A. Making improvements on it all the time.

Q. 45. How often did he say that to you?

A. I could not say.

Q. 46. Did Mr. Drawbaugh frequently speak to you in reference to his talking-machines, upon your visits, during the past eight years?

A. He did.

Q. 47. And did you, as frequently, find him at work on instruments appertaining to his talking-machine?

A. I did.

Q. 48. And did he, on those occasions, mention what he was doing?

A. I can't remember whether he did every time, or not.

Cross-examination by Mr. Smith:

Cross-Q. 49. Have you, previous to this time, made an affidavit respecting Drawbaugh's talking-instruments?

A. I have.

Cross-Q. 50. When did you make it, and who was present?

A. I am not able to give the date; last fall, in October, I may say. Mr. Drawbaugh, Mr. Jacobs, Mr. Bowman, and Mr. Railing were present.

Cross-Q. 51. Where were you when you gave it?

A. At Shiremanstown.

Cross-Q. 52. Have you always resided at Shiremanstown?

A. I have, with the exception of one year.

Cross-Q. 53. In answer to interrogatory seven, asking you to fix the time when Drawbaugh first spoke to you about talking-machines, you say: "It was in the fall of the year, but whether it was in the year 1872 or not I could not say." Why did you name that year?

A. In 1873, on up to 1875, I was only about now and then. I generally fish for trout, and when I go by there I generally stop in to see him, and those few seasons I did not follow any.

Cross-Q. 54. Were the instruments "B" and "F," at the time you first saw them, in the same condition that they are now?

A. No, sir.

Cross-Q. 55. In what respect was their condition different from what it is now?

A. Why, they were coated considerably better on the inside than what they are.

Cross-Q. 56. Is that all the difference that you see between their present condition and their condition then?

A. It is.

Cross-Q. 57. How came Mr. Drawbaugh to show them to you?

A. I generally take an interest in something of the kind, and I was looking at other machines there, and among them he showed me his talking-machines.

Cross-Q. 58. Whereabouts in the room were they when he showed them to you?

A. In the north-east corner, on some kind of a table or other—I don't know whether it was just a table or not.

Cross-Q. 59. What other machinery were you looking at at that time?

A. I fail to remember; but it was for registering drinks, or something of that kind, in a hotel.

Cross-Q. 60. Something that he had invented?

A. He claimed so.

Cross-Q. 61. What business was being carried on at that shop at that time?

A. I fail to remember.

Cross-Q. 62. At any of your visits after that, during the succeeding eight or nine years, did Mr. Drawbaugh show you any other inventions that he was at work on or had made, besides talking-machines?

A. Yes, sir.

Cross-Q. 63. Will you tell me what they were?

A. I don't remember.

Cross-Q. 64. Can't you call to mind any of them?

A. A clock. I don't know the names of the other. I can hardly say now.

Cross-Q. 65. Do you think there were a number of them?

A. Yes, sir.

Cross-Q. 66. Can you tell what they were any of them for?

A. No more than I mentioned before.

Cross-Q. 67. At the time of your first visit, when you saw the instruments "B" and "F," was any one else present?

A. I think there was.

Cross-Q. 68. Can you tell who?

A. Yes; A. G. Snyder.

Cross-Q. 69. At the time of your second visit, some three months later, what other talking-instruments besides "F" and "B" did you see?

A. Those four lying on the table, "A," "D," "E," and "I."

Cross-Q. 70. Did you see either of these four at the time of your first visit?

A. I think I did.

Cross-Q. 71. All of them?

A. I could not be positive.

Cross-Q. 72. Which ones of them do you feel most positive about?

A. That one ["I"]. I could not say to any of the rest.

Cross-Q. 73. Which one did you listen to when Mr. Drawbaugh spoke to you?

A. I could not tell.

Cross-Q. 74. How long did he speak to you, at the time of the second interview, through the instruments?

A. Perhaps, about three minutes.

Cross-Q. 75. Do you remember what he said?

A. I do not.

Cross-Q. 76. Do you know what instrument he used to speak into?

A. I do not.

Cross-Q. 77. How near was your ear to the instrument that you listened to?

A. It was close to it.

Cross-Q. 78. At any of the times when Mr. Drawbaugh told you he was making improvements on his talking-machines, did he say anything about what his improvements were, or what he was trying to do?

A. He explained improvements to me, but I don't remember what they were.

Cross-Q. 79. Can't you remember anything that he said about any of the improvements?

A. No, sir.

Cross-Q. 80. When did you next see the instruments "B" and "F," after the second time that you saw them?

A. I don't remember.

Cross-Q. 81. Did Mr. Drawbaugh say anything to you at any time about what he should do with his talking-machines, when he got through making improvements upon them?

A. No more than that he was just going to make the grandest thing out

Cross-Q. 82. When did he say that to you?

A. At different times.

Cross-Q. 83. How lately do you remember his saying that to you?

A. I can't give no date, but it is quite a while.

Cross-Q. 84. That is all that you remember, is it, of what he said about his improvements?

A. Yes, sir.

Re-direct by Mr. Abraham:

Q. Q. 85. When you first saw instrument "B," do you recollect whether those two coils of green wire were there at that time?

A. I think not; I think they were white.

Q. Q. 86. Do you know whether the end of this can, next to the wires, was open or not?

A. I don't remember.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 11th day of May, 1881.
FRED. M. OTT,
Examiner.

RUFUS K. SHIREMAN.

JACOB HAWN, *being produced, affirmed, and examined, saith:*

Examined by Mr. Jacobs:

Q. 1. State your age, residence, and occupation.

A. My age is fifty years; I reside at Wormleysburg, Cumberland county, Pa.; I am a blacksmith by trade.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pa., and if so, how long have you known him?

A. Yes, sir; I have known him for twenty years.

Q. 3. How long have you resided at Wormleysburg?

A. Since 1872.

Q. 4. Please state what time in 1872, if you can.

A. On the 27th of May.

Q. 5. Where did you reside prior to that time?

A. At Middletown, Dauphin county.

Q. 6. How long?

A. I moved to Middletown in 1861.

Q. 7. Did you ever visit the shop of Daniel Drawbaugh, at Eberly's Mills, whilst you resided at Middletown; and if so, once, or more than once?

A. Yes, sir; I visited it often.

Q. 8. During those visits, did you, or did you not, see any talking-machines there?

A. I did.

Q. 9. Among the instruments now before you on the table, can you identify the talking-machines which you then and there saw?

A. Yes, sir.

Q. 10. Please point them out.

A. This is one [indicating "B,"] and this one I know [indicating "F."]

Q. 11. Do you mean that you saw instrument "F" then and there?

A. Yes, sir.

Q. 12. Can you tell how long it was before May 27, 1872, that you saw the instruments that you have identified at Drawbaugh's shop?

A. No, sir; I cannot.

Q. 13. Who showed them to you?

A. Mr. Daniel Drawbaugh.

Q. 14. Did he explain them to you at the time, and tell you what they were for?

A. Yes, sir.

Q. 15. What did he say they were for?

A. For a talking-machine.

Q. 16. Did he tell you by what means they were operated?

A. Yes, sir.

Q. 17. Please state what he said on that subject, as nearly as you can recollect.

A. He said they would be operated on by a battery.

Q. 18. How far did he say he could talk with them?

A. He said that he would be able to operate, that a man preaching in

New York, that a congregation in Philadelphia would hear the same sermon.

Q. 19. Did he talk through them to you?

A. No, sir.

Q. 20. What reason, if any, did he assign for not doing so?

A. His wires were out of order, I think.

Q. 21. Have you visited that shop since the 27th of May, 1872?

A. Yes, sir.

Q. 22. How often, as nearly as you can tell?

A. I suppose once a year since then.

Q. 23. Do you think that you have been there every year since then?

A. Yes, sir.

Q. 24. State whether or not, during those visits, he has shown you other talking-machines.

A. Yes, sir.

Q. 25. Did they, as you first saw them, from time to time, have the appearance of being new machines, or old?

A. They appeared to be new ones.

Q. 26. Did you, or did you not, to the best of your recollection and belief, see new machines there during each year, from May 27, 1872, down to the summer of 1880?

A. I did, to the best of my knowledge.

Q. 27. Did Daniel Drawbaugh, from time to time, during those visits, show and explain those talking-machines to you?

A. Yes, sir.

Q. 28. Did he say anything about making improvements upon them from time to time? If so, what did he say?

A. He always said that he was improving them.

Q. 29. Did he make any comparison between his talking-machines and the telegraph? If so, what did he say?

A. He said that it would take the place of the telegraph, and that it would be better. He said that common people could use it better than telegraphing.

Q. 30. Did he explain why?

A. He said that people could talk to one another better than write it out.

Q. 31. Among the instruments now before you on the table, can you point out any besides "B" and "F" that you saw at Daniel Drawbaugh's shop prior to 1880?

A. Yes, sir; this one I can remember of seeing [indicating "I"] and that one I remember [indicating "A."] If you will listen, I will give you a little circumstance. When he first showed me "A," I thought it was a tape-line box.

Q. 32. Are you able to identify any of the others?

A. Not of these here ones, I am not.

[*On the table are instruments "A," "B," "D," "E," "F," "G," "I," "J," "K," "L," "M," "N," and "O."*]

Q. 33. Can you tell the general appearance of the new instruments that you saw from time to time at Drawbaugh's shop, as to size, material of which they were made, &c.?

A. The one was a pretty large one with a bell on the top of it. The others were smaller, of dark walnut wood, I suppose.

Q. 34. Did the smaller instruments at all resemble any of the instruments now on the table which you have not identified?

A. Yes, sir; I think they did.

Adjourned until 2 o'clock, P. M., for dinner.

Examination resumed pursuant to adjournment, at 2 o'clock, P. M.

Q. 35. Please look at the coils of wrapped wire on instrument "B," and say whether you remember of seeing them, or similar coils, upon that instrument when you first saw it before May 27, 1872.

A. I seen those, or something like them.

Q. 36. At that time?

A. Yes, sir.

Q. 37. During your various visits to the shop in which Daniel Drawbaugh worked, did he display much interest in explaining to you his talking-machines?

A. He did; more than in any other thing that he had.

Cross-examined by Mr. Smith:

Cross-Q. 38. Have you made an affidavit, in relation to the talking-machines, previous to this time?

A. Not previous to this time.

Cross-Q. 39. Will you give your best judgment as to how long it was before you moved away from Middletown when you first saw the instruments "B" and "F?"

A. I can't give any time.

Cross-Q. 40. Were they, at the time you saw them, before moving from Middletown, in the same condition that they are now?

A. I think they were about the same.

Cross-Q. 41. If you notice any difference, will you tell what it is?

A. I can't tell any difference.

Cross-Q. 42. How often do you think that you have talked to Drawbaugh about his talking-machines since you moved away from Middletown?

A. I can't tell how often, but he has talked to me several times.

Cross-Q. 43. Can you tell what he has said to you about them those times, or at any one time?

A. He has always said that it would be a better thing than the telegraphing, and would be a success.

Cross-Q. 44. Do you remember anything that he said about the nature of the improvements that he was making?

A. The nature of the improvements were to make it more perfect.

Cross-Q. 45. Did you talk with him about the talking-machine more than once before you moved away from Middletown?

A. I can't tell. It is most likely that I did.

Cross-Q. 46. Did you see the instruments "B" and "F" more than once before you moved away from Middletown?

A. That I can't tell, neither. It is about like the other. It is most likely that I did.

Cross-Q. 47. How often did you see the instruments "B" and "F" after you moved away from Middletown?

A. I saw them several times. I can't just give the definite number how often. Most every time I would go up to his shop he would explain to me, and show me his different machines.

Cross-Q. 48. Did he show you any other inventions that he was at work upon after you went away from Middletown?

A. Yes, sir.

Cross-Q. 49. What ones?

A. He showed me a clock he was working on; a patent spindle that they were making up there. He showed me some of them. That is about all.

Cross-Q. 50. Did he manifest much interest in the clock?

A. Not so much as he did in the talking-machine.

PHONE COMPANY,-1

Cross-Q. 51. Did you know anything about the manufacture of faucets in the shop after you moved away from Middletown ?

A. I think they were manufactured by another company afterwards.

Cross-Q. 52. In what years?

A. I can't tell the years.

Cross-Q. 53. Was it soon after you moved away from Middletown, or within the last three or four years?

A. My best judgment is that it was within the last three or four years.

Cross-Q. 54. Did you understand that the faucet they were making was one of Drawbaugh's invention?

A. Yes, sir.

Cross-Q. 55. Did he ever explain it to you or manifest much interest in it?

A. He explained it to me, but never manifested a great deal of interest in it. It was rather a simple thing, and did not require much.

Cross-Q. 56. Can you tell in what years you saw the spindle business going on?

A. I can't name the year.

Cross-Q. 57. Did you ever ask Mr. Drawbaugh why he did not put his talking-machine into use?

A. No, sir.

Cross-Q. 58. Did he ever say anything to you about being ready to put it into use?

A. Not that I remember of.

Cross-Q. 59. You spoke of seeing one talking-machine with a bell on it; when did you first see that instrument?

A. I can't tell when I first seen it.

Cross-Q. 60. Can't you give some idea whether it was two or three years ago, or six or eight?

A. No, sir; I can't.

Cross-Q. 61. What did Mr. Drawbaugh say to you about it?

A. I don't remember.

Cross-Q. 62. Can you describe the appearance of any other talking-instrument which he showed you as an improvement?

A. He showed me those smaller wooden boxes, made of walnut or black wood.

Cross-Q. 63. And did he tell you in what respect they were better than those he had had before?

A. Yes, sir; he would explain it to me.

Cross-Q. 64. In what respect did he say they were better?

A. I could not tell now in what respect. He would say it was an improvement on the last ones, still.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 11th day of May, 1881.
FRED. M. OTT,
Examiner.

JACOB HAWN.

HENRY M. DARR, *being produced, affirmed, and examined, saith:*

Examined by Mr. Jacobs:

Q. 1. State your age, residence, and occupation.

A. I am fifty-six years old; I live in Lower Allen township, Cumberland county, a short mile from Shiremanstown. I am a day's laborer.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pa.? If so, how long have you known him?

A. Yes; I have known him twenty-five or thirty years already.

Q. 3. How long have you lived where you now reside?

A. Two years the first of last April.

Q. 4. Where did you reside prior to the fall of 1874?

A. On "Slate Hill."

Q. 5. When did you move away from there, and where did you move to?

A. I left "Slate Hill" the 19th of November, 1874, and moved down the Lisburn road into old Johnny Strong's house.

Q. 6. How long did you remain there?

A. Four years, and from 19th of November to April 1st over the four years.

Q. 7. Did you ever visit the shop in which Daniel Drawbaugh worked, at Eberly's Mills?

A. I did, in the spring after I moved down. He had got some potatoes from me.

Q. 8. At what time in the year 1875 was that?

A. I could not exactly tell, but it was between spring and haymaking, before the new potatoes came.

Q. 9. Am I right in saying 1875?

A. Yes, sir; in 1875, in the spring, was the time he got the potatoes.

Q. 10. Where were those potatoes raised?

A. On Slate Hill.

Q. 11. Before you moved away from there?

A. Yes, sir.

Q. 12. Did you ever see any talking-machines at his shop, and, if so, when did you first see them?

A. Yes, sir; I did, the day that I took them potatoes down.

Q. 13. Who showed them to you?

A. Mr. Daniel Drawbaugh.

Q. 14. Do you remember the appearance of any of them?

A. He gave me a thing to hold to my ear. I guess I would know it.

Q. 15. Did it resemble any of the machines now before you on the table?

A. I think it was that thing [taking up instrument "A"]. I am pretty certain it was that thing.

Q. 16. Where was it when you first saw it?

A. It was—he had it up in a corner of his shop, and this here thing ["A"] was laying on a table, and he said that he would go in the cellar, and I should hold this at my ear, and he would talk to me.

Q. 17. On what floor of the shop were you when he told you this?

A. On the first floor from the cellar up. It would be the second.

Q. 18. Did he go down stairs and talk to you?

A. Yes, sir.

Q. 19. Did you hear and understand what he said?

A. Yes, sir.

Q. 20. Do you remember now what he said?

A. No, sir.

Q. 21. Did you see any wires in connection with the instrument which you held to your ear?

A. Yes, sir; there was.

Q. 22. Did he say whether or not he could use the machine for talking at longer distances than from floor to floor of the same house?

A. Yes, sir; he said it could be made that you could talk to New York.

Q. 23. Did you go down into the cellar to see the instruments into which he spoke?

A. No, sir; I did not.

Q. 24. Could you have heard and understood what he said, except through the instrument?

A. I don't suppose that I could.

Cross-examined by Mr. Smith:

Cross-Q. 25. How long did he talk to you through the instrument?

A. I couldn't tell; not long, at all.

Cross-Q. 26. Was that the only time you were ever at his shop?

A. I was there frequently afterwards.

Cross-Q. 27. How often, do you think?

A. I don't know. I was there different times collecting road tax in the shop.

Cross-Q. 28. How far did you live from him when you lived at Johnny Strong's house?

A. About two miles, as near as I can tell.

Cross-Q. 29. Were you ever in his shop when you lived at Slate Hill?

A. Yes, I was.

Cross-Q. 30. How often?

A. I couldn't tell you.

Cross-Q. 31. How far did you live from him when you lived at Slate Hill?

A. Two miles and a half.

Cross-Q. 32. How far do you live from him now?

A. I suppose about two and a half; I couldn't exactly tell.

Cross-Q. 33. Did you ever see that talking-instrument again, or any others, at any of your visits to Drawbaugh's shop after that time?

A. Only the one time that I saw it.

Cross-Q. 34. Did you ever speak to him again about it?

A. No, sir.

Cross-Q. 35. Did you see any other talking-instruments at that time, except the one which you indicated?

A. Not that I can recollect.

Cross-Q. 36. What business was being done in the shop at that time?

A. I couldn't exactly tell you.

Cross-Q. 37. Did you ever see any business carried on in that shop after that time?

A. Yes, sir.

Cross-Q. 38. Do you know what business was carried on in that shop while you lived at Slate Hill?

A. No, sir; I don't know what.

Cross-Q. 39. Did you ever see any electric clocks in Drawbaugh's shop, or clocks that were intended to run without winding up?

A. I seen clocks there.

Cross-Q. 40. When did you see them there?

A. I could not just tell.

Cross-Q. 41. Did you ever see any faucet manufacturing carried on there?

A. I seen them making some there—working.

Cross-Q. 42. When was that?

A. A few years ago.

Cross-Q. 43. What do you mean—two or three years ago, or eight or ten years ago?

A. Two or three years.

Cross-Q. 44. How often were you there when they were carrying on the faucet business?

A. I couldn't tell, hardly. Once or twice, I believe.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 11th day of May, 1881.
FRED. M. OTT,
Examiner.

HENRY M. DARR.

NORMAN W. KAHNY, *being produced, affirmed, and examined, saith:*

Examined by Mr. Abraham:

Q. 1. State your age, residence, and occupation.

A. I am twenty-three years of age; live at White Hill, Cumberland county, and am a laborer.

Q. 2. How long have you lived at White Hill?

A. Two years.

Q. 3. Where did you reside before you went to White Hill?

A. About one half mile west of Milltown.

Q. 4. When did you move to that last-named location?

A. Six years ago.

Q. 5. Am I to understand, then, that you moved to half a mile from Milltown some time in the year 1875?

A. No, sir; I did not.

Q. 24. Could you have heard and understood what he said, except through the instrument?

A. I don't suppose that I could.

Cross-examined by Mr. Smith:

Cross-Q. 25. How long did he talk to you through the instrument?

A. I couldn't tell; not long, at all.

Cross-Q. 26. Was that the only time you were ever at his shop?

A. I was there frequently afterwards.

Cross-Q. 27. How often, do you think?

A. I don't know. I was there different times collecting road tax in the shop.

Cross-Q. 28. How far did you live from him when you lived at Johnny Strong's house?

A. About two miles, as near as I can tell.

Cross-Q. 29. Were you ever in his shop when you lived at Slate Hill?

A. Yes, I was.

Cross-Q. 30. How often?

A. I couldn't tell you.

Cross-Q. 31. How far did you live from him when you lived at Slate Hill?

A. Two miles and a half.

Cross-Q. 32. How far do you live from him now?

A. I suppose about two and a half; I couldn't exactly tell.

Cross-Q. 33. Did you ever see that talking-instrument again, or any others, at any of your visits to Drawbaugh's shop after that time?

A. Only the one time that I saw it.

Cross-Q. 34. Did you ever speak to him again about it?

A. No, sir.

Cross-Q. 35. Did you see any other talking-instruments at that time, except the one which you indicated?

A. Not that I can recollect.

Cross-Q. 36. What business was being done in the shop at that time?

A. I couldn't exactly tell you.

Cross-Q. 37. Did you ever see any business carried on in that shop after that time?

A. Yes, sir.

PHONE COMPANY,-1

Cross-Q. 38. Do you know what business was carried on in that shop while you lived at Slate Hill?

A. No, sir; I don't know what.

Cross-Q. 39. Did you ever see any electric clocks in Drawbaugh's shop, or clocks that were intended to run without winding up?

A. I seen clocks there.

Cross-Q. 40. When did you see them there?

A. I could not just tell.

Cross-Q. 41. Did you ever see any faucet manufacturing carried on there?

A. I seen them making some there—working.

Cross-Q. 42. When was that?

A. A few years ago.

Cross-Q. 43. What do you mean—two or three years ago, or eight or ten years ago?

A. Two or three years.

Cross-Q. 44. How often were you there when they were carrying on the faucet business?

A. I couldn't tell, hardly. Once or twice, I believe.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 11th day of May, 1881.

FRED. M. OTT,
Examiner.

HENRY M. DARR.

NORMAN W. KAHNY, *being produced, affirmed, and examined, saith:*

Examined by Mr. Abrahum:

Q. 1. State your age, residence, and occupation.

A. I am twenty-three years of age; live at White Hill, Cumberland county, and am a laborer.

Q. 2. How long have you lived at White Hill?

A. Two years.

Q. 3. Where did you reside before you went to White Hill?

A. About one half mile west of Milltown.

Q. 4. When did you move to that last-named location?

A. Six years ago.

Q. 5. Am I to understand, then, that you moved to half a mile from Milltown some time in the year 1875?

A. Yes, sir; the spring of 1875.

Q. 6. While there, did you become acquainted with Daniel Drawbaugh, of Eberly's Mills?

A. No, sir; not while there.

Q. 7. Are you acquainted with him at all?

A. Yes, sir.

Q. 8. How long have you known him?

A. Ten years.

Q. 9. Where did you live when you first became acquainted with him?

A. At Milltown.

Q. 10. When did you first reside at Milltown?

A. In 1871.

Q. 11. Did you ever visit the shop in which Daniel Drawbaugh worked, at Eberly's Mills?

A. Yes, sir.

Q. 12. Did he, at any of those visits, show you instruments which he called talking-machines?

A. He did.

Q. 13. When was the first time he showed you those instruments?

A. I think in 1872.

Q. 14. Did he tell you what he accomplished by means of the instruments shown to you?

A. Yes, sir.

Q. 15. Please state what he told you, so far as your memory serves you.

A. He told me he was able to talk to any person, to any distance with them, through that machine.

Q. 16. Would you be able to recognize the instruments he showed you at that time, if they were showed to you now?

A. I think not definitely.

Q. 17. Did he talk through them to you on that occasion?

A. No, sir.

Q. 18. Can you name any particular distance to which he said he could speak by means of these instruments?

A. Yes, sir.

Q. 19. State what he said in respect to distance.

A. He said he could just as easy speak ten miles as one, or any distance he would choose to.

Q. 20. Did he tell you by what means or principle his talking-machines were operated?

A. No, sir; not at that time.

Q. 21. After your visit in 1872, when Mr. Drawbaugh showed you his talking-instruments, when did you next visit his shop?

A. I could not say when I next visited it.

Q. 22. Did you visit him in the same year again?

A. I may have.

Q. 23. Did you visit him in 1873?

A. No, sir.

Q. 24. Did you visit him in 1874, '5, or '6 at his shop?

A. Yes, sir; in 1875 and '6.

Q. 25. At these later visits, did Mr. Drawbaugh show you ing-machines again?

A. Yes, sir.

Q. 26. Did he then tell you how they were operated?

A. Yes, sir.

Q. 27. Please tell us all he said in reference to his talking-machines.

A. He said that the machine was operated by electricity—by a battery. He said that he intended to try them, to put them on test from his shop along the creek. He said—he spoke of running a line, and get a man from Mechanicsburg to go in partners with him to have the thing patented. That is about all I can remember that was talked at that time.

Q. 28. During these visits, in 1875 and 1876, have you, in your memory, any special one in view?

A. Yes, sir.

Q. 29. Did he, at that special visit, ever speak to you by means of his talking-machines?

A. Yes, sir.

Q. 30. What part of the building were you in at that time?

A. In an office in the lower end of the building, next to the creek.

Q. 31. Please examine instrument "A," now shown you, and state whether you ever saw it before.

A. I think I did.

Q. 32. When did you see it?

A. In 1876.

Q. 33. Did the special visit that you have been testifying to occur in the year 1876?

A. Yes, sir.

Q. 34. Who showed it to you?

A. Daniel Drawbaugh.

Q. 35. Did he or you use it in any manner during that interview?

A. Yes, sir; I used it.

Q. 36. State how you used it.

A. By holding it to my ear.

Q. 37. When you held it to your ear, what happened?

A. I heard Mr. Drawbaugh speak.

Q. 38. Did you hear him speak through the instrument?

A. Yes, sir; the sound came from the instrument.

Q. 39. Where was Mr. Drawbaugh at the time?

A. I cannot say where he was.

Q. 40. Was he in the same room with you?

A. No, sir.

Q. 41. Before he left you, did he tell you where he was going?

A. Yes, sir; he said he was going down to talk through the machine.

Q. 42. Did he tell you what to do with this instrument "A"?

A. Yes, sir.

Q. 43. What did he tell you to do with it?

A. Hold it to my ear.

Q. 44. When you held it to your ear and heard speaking through it, did you recognize the voice as being that of Daniel Drawbaugh?

A. Yes, sir.

Q. 45. When he left you to go down stairs, did you hear his footsteps along the room and down the stairway?

A. I don't remember.

Q. 46. Do you remember what time of the day this special interview took place?

A. Yes, sir; it was in the evening.

Q. 47. Did you see by means of the moon or artificial light?

A. By artificial light.

Q. 48. What light had you?

A. An oil lamp.

Cross-examined by Mr. Smith:

Cross-Q. 49. Did you go to Mr. Drawbaugh's shop any after 1876?

A. Yes, sir.

Cross-Q. 50. How often, and during what years?

A. Frequently, to the present time.

Cross-Q. 51. Did he tell you who the man was at Mechanicsburg that he proposed to have go into partnership with him?

A. I do not know.

Cross-Q. 52. What did he say about this instrument ["A"] when he showed it to you?

A. He told me to hold it to my ear, and I would hear him talking to me.

Cross-Q. 53. Is that all that he said about it?

A. Yes, sir; all he said about this instrument.

Cross-Q. 54. Did he say anything about other instruments?

A. He said he had an instrument attached to the other end.

Cross-Q. 55. Did he tell you what it was, or did you see it?

A. He told me it was an instrument through which he would talk at the other end. I did not see it.

Cross-Q. 56. Did you ever see a line of wire running out from his shop along the creek?

A. Not for the talking-machine, I didn't.

Cross-Q. 57. If you saw it for any other purpose, what was the purpose and when was it?

A. I saw wires—I don't know for what purpose. They were just common telegraph wire. What they were for, I don't know. I don't know when it was. I suppose they are there yet, perhaps.

Cross-Q. 58. Did you ever see the instrument "A" after 1876?

A. I may have seen it.

Cross-Q. 59. Do you think you saw it at any of your visits to Drawbaugh's shop after 1876?

A. I may have seen it there.

Cross-Q. 60. Did you, at any of those visits after 1876, see any other talking-instruments there?

A. I may have seen other instruments, but don't know whether they were for talking or not.

Cross-Q. 61. Did you ever talk with Mr. Drawbaugh after 1876 about this talking-machine?

A. Yes, sir.

Cross-Q. 62. When and where?

A. I don't remember when. It was at his shop.

Cross-Q. 63. What did he say about them?

A. I don't remember what he said.

Cross-Q. 64. Have not you any recollection at all of what he said at those subsequent times?

A. No, sir; I have not.

Cross-Q. 65. Do you remember whether he said anything about patenting them or putting them into use at those times?

[*Objected to by Mr. Abraham for the reason that the witness has twice stated that he cannot recollect the conversation now again inquired about.*]

A. No, sir; not after 1876.

Cross-Q. 66. Do you remember what business was carried on at Mr. Drawbaugh's shop after 1876 down to 1880?

A. I remember some.

Cross-Q. 67. What do you remember seeing done there during those years?

A. They were manufacturing clocks there, and faucets, that I remember since that time.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 11th day of May, 1881.
FRED. M. OTT,
Examiner.

NORMAN W. KAHNY.

Adjourned until 9.30, A. M., May 12th.

May 12, 1881, 9.30, A. M.

Examination resumed pursuant to adjournment.

Present, Mr. Smith for complainants, and Mr. Jacobs and Mr. Abraham for respondents.

WILLIAM EPPLEY, *being produced, affirmed, and examined, saith:*

Examined by Mr. Abraham:

Q. 1. State your age, residence, and occupation.

A. My age is between fifty-one and two; residence, Cumberland county, Pa.; farming is my occupation.

Q. 2. Are you acquainted with Mr. Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pa.? If so, how long have you known him?

A. About twenty years I have been personally acquainted with him.

HONE COMPANY,-1

Q. 3. Did you ever visit him at the place where he has been working, commonly known as the clover-mill, at Milltown, or Eberly's Mills?

A. I have.

Q. 4. State when you last visited him there.

A. I visited at his place in May or June, 1875.

Q. 5. Was that the last time you were at his place?

A. To the best of my knowledge, it was.

Q. 6. How often were you there for the two years prior to May or June, 1875?

A. That I could not say how often I was there. I was there several times during that period from 1873 to 1875; how often, I could not tell.

Q. 7. During your visits from 1873 to 1875, did Mr. Drawbaugh ever show you any instruments he called talking-machines?

A. Yes, sir.

Q. 8. Did he explain them to you?

A. Yes, sir; he explained it to me, what he had intended it for.

Q. 9. What did he say to you about his talking-machine?

A. He told me it was to take the place of telegraphing.

Q. 10. What did he tell you about his operating his machine?

A. He told me that he had tried it on wires that he had strung for several miles on fences or trees, I forget which, to see how far he could carry the sound distinctly—that he was operating on that.

Q. 11. Did he say from whom he had procured that wire, and what description of wire it was?

A. He told me that he had got—still, I am not positive—from Mr. Gorgas, common fencing wire, that he used to use some years ago. Mr. Gorgas had used it for fencing wire

Q. 12. Have you in your mind any special visit when the above conversations took place between you and Mr. Drawbaugh relative to his using miles of wire in connection with his talking-machine?

A. No, sir; I can't give you any particular date, only it was between those two dates.

Q. 13. Do you recollect any particular business that took you down to Mr. Drawbaugh's establishment about that period, concerning which you have testified?

A. No, sir; I don't.

Q. 14. Do you know what kind of business or work was going on in his shop when you had this conversation relative to the talking-machine?

A. There was—part of the time that I was visiting there, there was no other work going on in the shop; that is, in the early part. I don't remember of anybody working there until Kline and Bear got in with their spindle business. That was in 1875.

Q. 15. Did Mr. Drawbaugh show you his talking-instruments or explain his talking-machines to you on more occasions than one?

A. I don't remember more than one occasion.

Q. 16. Please examine instruments "B" and "F" now shown you, and state whether you ever saw them at Mr. Drawbaugh's shop.

A. I couldn't say positive whether I saw these or not. I saw instruments there, but it is so long that I could not really make it positive whether these were the ones or something similar to them.

Q. 17. Do I understand you to say that Mr. Drawbaugh exhibited to you some instruments that he called his talking-machines—similar to "B" and "F"—but, from the lapse of time, you are unable, positively, to identify these as the identical ones?

A. Yes, sir. He showed me instruments that he had used for that purpose. I could not say whether they were just similar to those or not, altogether. Of course, those machines that he had were used for that purpose—for his operating—to get the sound on the wire. He told me so. Of course, I did not see him operating at all.

Q. 18. Please examine instrument "A," and state whether you saw that, or one similar to it, at Mr. Drawbaugh's place.

A. That I could not say, positively, that I saw this there, or not. It may have been laying on his desk—on his bench, rather—with his other tools and fixtures there. He had something similar to this laying there.

Cross-examined by Mr. Smith:

Cross-Q. 19. How near is your residence to Mr. Drawbaugh's shop?

A. About three miles.

Cross-Q. 20. How long have you lived at that place?

A. I have been living there sixteen years.

Cross-Q. 21. How often did you visit his shop before 1873?

A. I could not say how often.

Cross-Q. 22. Could you say whether you generally went there a half-dozen or a dozen times a year?

A. No, sir; I could not say. I did not go that often there.

HONE COMPANY,-1

Cross-Q. 23. Have you told us all that he said to you about his talking-machines?

A. All that I remember of clearly at the present.

Cross-Q. 24. How often have you seen Mr. Drawbaugh anywhere since 1875?

A. That I could not say how often. I have met him on the way back and forward to the city here—Harrisburg; but not so often.

Cross-Q. 25. Do you come through Eberly's Mills in coming to Harrisburg?

A. No, sir.

Examination taken, reduced to
writing, and by the witness affirmed
and subscribed to before me, this
12th day of May, 1881.
FRED. M. OTT,
Examiner.

WM. EPPLEY.

Adjourned until Saturday, May 14, 1881, at 9.30, A. M.

[*The examiner is requested to note that the frequent handling of instruments marked "B" and "F" causes some of the plaster interlining to scale off and fall out.*]

Saturday, May 14, 9.30, A. M.

Examination resumed, pursuant to adjournment.

Present, Mr. Storrow for complainants, and Mr. Jacobs for respondents.

HENRY B. EBERLY, *being produced, sworn, and examined, saith:*

Examined by Mr. Jacobs:

Q. 1. State your age, residence, and occupation.

A. My age will be thirty-one on the 14th of June; residence, Williamsport, Penn'a.; my occupation is book-keeping.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pa.? If so, how long have you known him?

A. I have known Daniel Drawbaugh from my infancy, I suppose.

Q. 3. How long have you resided in Williamsport?

A. Since May, 1873.

Q. 4. What time in May?

A. It was May 27th when I left here and arrived at Williamsport.

Q. 5. Where did you reside immediately prior to that time?

A. With my parents, at Shiremanstown.

Q. 6. From what time?

A. I was away during one summer, but returned again in the winter. We moved to Shiremanstown from New Cumberland, I think, in December, 1870.

Q. 7. When did you move to New Cumberland, and from what place?

A. I think in the spring of 1867, from Eberly's Mills.

Q. 8. Have you ever been back to Eberly's Mills, or to Cumberland county, since you moved to Williamsport, on the 27th of May, 1873?

A. No, sir.

Q. 9. Please look at instruments marked "B" and "F," and state where you first saw them.

A. I saw these in his shop—in his office.

Q. 10. Whose shop?

A. That is where he worked—Daniel Drawbaugh.

Q. 11. When did you see it first?

A. It was some time before May 27, 1873.

Q. 12. Do you remember whether it was explained to you at the time?

A. He may have explained it to me, but I don't remember it now.

Q. 13. Prior to the time when you saw those instruments, had you heard him say anything about making a machine for speaking or hearing at a distance? If so, when and under what circumstances?

A. I do recollect of him speaking about attaching an instrument to the office, by which he could hear all that was going on at the mill-office, without leaving his house. He made this remark one Sunday in the mill-office, in company of we boys and a party that usually congregated in there. This was between 1861 and 1864; that is the nearest I can come at it; it was during the war.

Q. 14. What was the distance from the mill-office to his house?

A. I would suppose about forty feet.

Cross-examined by Mr. Storrow:

Cross-Q. 15. What were you and the other parties in the habit of congregating for at the mill-office on Sunday?

A. No other purpose, I don't suppose, than to spend the time.

Cross-Q. 16. What mill was that, and how near to Drawbaugh's shop?

A. It was my father's grist-mill. The office being built near the end, was, I suppose, twelve or sixteen feet further away than the mill from the house. It was about twenty feet from Drawbaugh's shop.

Cross-Q. 17. The mill and Drawbaugh's shop were common places of resort on Sundays, were they not?

A. Yes, sir; the mill more so than the shop.

Cross-Q. 18. The creek was a good place for fishing, and a good many people from Harrisburg and elsewhere were in the habit of going up there in fishing season, were they not?

A. Yes, sir.

Cross-Q. 19. When people were up there for fishing or pastime, it was very common for Drawbaugh to tell them about things he had invented and was going to make, or for the conversation to turn on him and what he had done, was not it?

[*Objected to by Mr. Jacobs as not proper cross examination.*]

A. It was common for him to tell me, and others in the town, but don't recollect of him telling fishermen that came there, as I was not always present.

Cross-Q. 20. Ever since you have known him, he has been looked upon by the community as a genius, who got up things that nobody else could make, and that other folks could hardly understand, was not he?

A. Yes, sir.

Cross-Q. 21. Around the neighborhood of that mill has been quite a place for picnic parties, has not it?

A. Not close to the mill.

Cross-Q. 22. What business was carried on at his shop along during the war?

A. He was working at his business of making machines, stave-jointers, stave-cutters, mill-tram, and other work in his line.

Cross-Q. 23. Were these things that he was making mostly things that he had invented and patented?

A. Yes, sir; all the machines mentioned there were his inventions.

Cross-Q. 24. I suppose he had machines to work with, such as lathes, and planers, and water-power to drive them, had not he

A. At that time I can only remember of him having one lathe, which was in the mill, and where he got the power.

Cross-Q. 25. The shop belonged to your father, Mr. Christian Eberly, I believe, did it not?

A. Yes, sir.

Cross-Q. 26. And still does?

A. No, sir; not now.

Cross-Q. 27. What business was carried on at the shop after the war?

A. He worked there. I don't remember what he was working at, except the molasses faucet.

Cross-Q. 28. How did you happen to be at the shop on the particular occasion when you saw "F" and "B," as you stated before?

A. Just as I would happen in.

Cross-Q. 29. Did you happen in there pretty often before you moved to Williamsport?

A. Yes, sir; quite often.

Cross-Q. 30. Who was present when you saw "F" and "B?"

A. I can't tell that.

Cross-Q. 31. When was it?

A. It was before we moved to New Cumberland, or about then. I can't remember the date.

Cross-Q. 32. When you saw them on this occasion, were they lying on a bench, or were they in a box, or how?

A. I can't tell where they were lying when I saw them.

Cross-Q. 33. Were they lying around somewhere in the office, or did he take them out of a cupboard or a box, somewhere, to show you?

A. I don't remember that, just now.

Cross-Q. 34. Were they lying together, when you saw them, or were they lying in different parts of the office?

A. I don't remember of seeing them lying at any one particular place.

Cross-Q. 35. Were they in just the same condition then that they are in now?

A. I think there was more to "B;" what more was to it I don't recollect any more. I don't think the bottom of "F" was broken.

Cross-Q. 36. What else did you see in the office at this time, in the way of machines or things that Drawbaugh had made?

A. I can remember of a model of his nail-feeder. I can't call to mind the others.

Cross-Q. 37. Did not you see some magnetic clocks in his office at this time?

A. He was working at electric clocks, but can't say if it was before 1866.

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Cross-Q. 38. On the occasion when you saw "F" and "B," did not you see some electric clocks?

A. No, not that I remember; that was before 1865. I can't remember seeing any before that time or 1866.

Cross-Q. 39. I understand from your answer that it was somewhere about 1865, or not later than 1866, that you first saw "F" and "B." Am I right in that

A. I think it was about that time.

Cross-Q. 40. What story of the shop was the office in when you saw "F" and "B" there?

A. I saw these at different times; I can't say the exact time in either shop. He moved away from the shop he did occupy behind the mill, I think in the spring of 1867, to the one down on the creek. I was at school at the time.

Cross-Q. 41. Which of these shops does he occupy now?

A. I don't know; I have not been there to see.

Cross-Q. 42. You testified in your eighth answer that you had not been back to Cumberland county since you moved to Williamsport, in 1873. Do you mean that you have never been to Cumberland county in all these eight years?

A. Yes, sir.

Cross-Q. 43. How far is Williamsport from Cumberland county?

A. I suppose it is nearly one hundred miles.

Cross-Q. 44. Has your father lived in Cumberland county during these eight years?

A. Yes, sir.

Cross-Q. 45. Whose employment did you go into when you first went to Williamsport?

A. I was policy-writer in the Mutual Life and Accident Insurance Company of Pennsylvania.

Cross-Q. 46. How long did you stay with them and whom did you go to next?

A. About four years and a half. After that, was engaged in keeping books, but for no particular persons, until about the middle of August, 1878, when I was employed by A. H. Heilman & Co., furniture dealers, as book-keeper, and am now with them.

Cross-Q. 47. Where is their place of business in Williamsport?

A. Third street.

Cross-Q. 48. Where do you live in Williamsport?

A. I board at the Central hotel, so-called, Fourth street. It is no hotel; it is a boarding-house.

Re-direct by Mr. Jacobs:

Q. Q. 49. In what shop was Daniel Drawbaugh working between 1861 and 1864, during the war?

A. In the shop behind the mill, as we always called it.

Q. Q. 50. Did he remove to the shop on the creek before or after the old faucet company, composed of William R. Gorgas, Henry S. Rupp, Samuel M. Hertzler, and others, went into operation?

A. He removed after that. He went with them.

Re-cross by Mr. Storrow:

Re-cross-Q. 51. I understand you to mean, then, that that company first made faucets at his shop by the mill; and after they had established the business of manufacturing his faucet there, he and they moved their business to another building. Is that what you mean?

A. I don't know as they ever made faucets at the office behind the mill—by this company.

Re-cross-Q. 52. Then you mean to say that he moved before they began to manufacture faucets, do you?

A. I mean to say that, when this company was formed, the way that I understood it, Daniel Drawbaugh devoted his time and attention to putting up the machines, and getting the business of making faucets started.

Re-cross-Q. 53. And do you mean that this machinery was put up for that purpose, not in the office behind the mill, but in another building, and that this company manufactured the faucets, not in the office behind the mill, but in that other building where the machinery was put up?

A. Yes, sir; but we never called the shop behind the mill an office.

Examination taken, reduced to
writing, and by the witness sub-
scribed and sworn to before me,
this fourteenth day of May, 1881.
FRED. M. OTT,
Examiner.

H. B. EBERLY.

Daniel A. Hamacher, *being produced, affirmed, and examined, saith:*

Examined by Mr. Jacobs:

Q. 1. State your age, residence, and occupation.

A. Twenty-nine years; Shiremanstown, Cumberland county; school teacher.

Q. 2. Where do you now teach?

A. At the Gorgas, or Cedar Hill, school-house, Lower Allen township.

Q. 3. How far from Eberly's Mills?

A. By the road it is about a fourth of a mile, as near as I can tell.

Q. 4. Are you acquainted with Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Penn'a? If so, how long have you known him?

A. I have known him since the first day of February, 1876.

Q. 5. How did you become acquainted with him?

A. By going to his shop.

Q. 6. With whom did you go, and under what circumstances?

A. I went with a number of my pupils: John F. Rupp, David C. Rupp, Solomon S. Rupp, Forrest Shank, and a number of others. We went to visit Mr. Strong's school. He was teaching at the Cedar Hill, or Gorgas school, and we remained there until the middle of the afternoon, for the purpose of seeing the machines he was working on.

Q. 7. The machines who was working on?

A. Daniel Drawbaugh.

Q. 8. Am I to understand that you went to the shop of Daniel Drawbaugh for the purpose of seeing those machines?

A. Yes, sir.

Q. 9. How do you fix the date?

A. On the last of January and the first of February, they were putting new desks and furniture in the house in which I taught—the Cedar Run school, Lower Allen township.

Q. 10. How are you able to fix these two days?

A. From the book of the secretary of the Lower Allen school board, and from my own report given to the directors, and also the report book at the Cedar Hill school.

[*Answer objected to by Mr. Storrow, unless all the writings referred to are produced.*]

Q. 11. Have you examined any or all of these reports recently, for the purpose of fixing the date?

[*Question objected to as above.*]

A. Not the secretary's, recently. The report-book of the Cedar Hill school has been in the school-room in which I taught for the last three consecutive winters; I used it. The other books I will bring, if I can get possession of the secretary's book. The two report-books I can get.

Q. 12. Please state whether or not, upon the visit to the shop of Daniel Drawbaugh, referred to, you saw there any talking-machines?

A. I did.

Q. 13. Please look at the instruments now before you on the table, and pick out from among them, if you can, any that you remember of seeing then and there?

A. Here is the machine [taking up "A"] that Mr. Drawbaugh showed me, or one similar to it.

Q. 14. Did you see any other talking-machines there that you do not now identify?

A. I saw a number of talking-machines.

Q. 15. Did he explain them, or any of them, to you at the time?

A. Yes, sir.

Q. 16. Did he tell you what they were for? If so, please state, as nearly as you can, what he said about them?

A. He said they were used to convey words by means of electricity.

Q. 17. Did he say how far?

A. He said the time would come that you could speak to San Francisco.

Q. 18. Did he make any comparison between his talking-machines and the telegraph?

A. He thought the talking-machine would take the place of the telegraph.

Q. 19. Do you remember his having any instrument there at that time for telegraphing?

A. Yes, sir.

Q. 20. Did you see it before or after you saw the talking-machines?

A. Before.

Q. 21. Did you have any conversation with him with regard to the instrument for telegraphing and the talking-machines? If so, please state what it was—what you said to him and what he said to you?

A. I asked him why he did not get the telegraph patented. His answer was "the telephone will take its place." He used the word speaking-machine. I have got the two words mixed.

Q. 22. Did he then show and explain to you the spe king-machine?

A. He did.

Q. 23. How old were the pupils who were with you?

A. Their ages may have been from thirteen to nineteen, as near as I can tell.

Q. 24. When did you next visit that shop?

A. In the beginning of the year 1879.

Q. 25. Did you then see talking-machines there? If so, were they the same which you had seen in 1876, or others?

A. They were different. I saw them—they were different.

Q. 26. Among those before you on the table, can you pick out any which you saw at that visit in 1879, and which you had not seen at your former visit?

A. There was one similar to this ["H,"] I saw in the spring, or beginning of the year, 1879. I saw this machine ["J"] in his shop, but I can't fix the date. I saw other machines in 1879, besides those two, but can't identify them.

Recess for dinner until 12.15, P. M.

May 14, 1881, 2.30, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Q. 27. Can you give any idea of the other instruments which you saw at Drawbaugh's shop at that visit in 1879? What was their general appearance, size, shape, material of which they were made, &c.?

A. I cannot describe them.

Q. 28. Do you remember whether they were large or small?

[*Objected to on the ground that the witness' memory has already been exhausted.*]

A. I can't say.

Q. 29. State whether or not you made any visits to Drawbaugh's shop between the time of the visit last referred to and the middle of the year 1880?

A. I visited the shop frequently after that.

Q. 30. Did you, during those visits, see any new talking-machines which you had not seen at either of the former visits which you have already testified about?

A. I did.

Q. 31. State whether or not, during either of those years, Daniel Drawbaugh talked to you through any of the machines; and, if so, when it was, as nearly as you can recollect.

A. In the spring term of 1879, I taught a summer-school there, and between the beginning of the term (about the first of April) and the—towards the middle of June, Mr. Drawbaugh said, through the speaking-machine, "How is the school getting along?" He asked me those words.

Q. 32. Where was the instrument into which he talked, and where was the instrument at which you listened?

A. The instrument in which he talked was in the south-east corner of the third floor; the machine at which I listened was in the north-west corner of the second floor.

Q. 33. Was the instrument at which you listened large or small?

A. It was larger than this one ["K"]; it was smaller than this one ["J"].

Q. 34. Was the instrument into which he spoke large or small?

A. It was similar to the one at which I listened.

Q. 35. Had you seen either of those machines at any of your former visits?

A. Not to my recollection. They were apparently new.

Q. 36. Did he tell you, during those years—during 1879 or the first half of 1880—whether or not he was still working upon the talking-machines and improving them?

A. He did not tell me directly that he was improving the machines.

Q. 37. What did he tell you on that subject, if anything, as nearly as you can recollect?

A. I cannot remember what he said. He had machines, and was always anxious to show them.

Q. 38. During that time, did he show you new machines once, or more than once?

A. As I stated before, the machines were apparently new. I saw the machines, during the time stated, frequently.

Q. 39. Please state whether, during that time, he showed you any other instruments which were new, or apparently new, than those through which he spoke to you in the spring of 1879?

A. I cannot say.

Q. 40. Do you know what were the financial circumstances of Daniel Drawbaugh during the year 1879, and the first half of 1880?

A. Only so far as I had dealings with him.

Q. 41. Please state what those dealings were, and how far, by them, you were enabled to know anything about his financial circumstances.

A. That is a delicate question. During the spring term of 1879 and the spring term of 1880, I taught school at the Cedar Hill, or Gorgas, school-house. Mr. Drawbaugh sent his children to me to school, and, also, I purchased some books for those children, and it was a great deal of trouble to collect the money. I did not get it until the beginning of September, of the fall of 1880. I gave it to a constable to collect—Mr. A. B. Shank was the constable. He collected the money. Amount of all, books and tuition, thirteen dollars and odd cents.

Q. 42. Did you ask him for it frequently?

A. I would go to the shop, and he would generally talk about the matter himself, and say he had not the money to pay me.

Q. 43. When did you last ask him for it, if at all, before putting it into the hands of the constable?

A. At the close of the spring term of 1880, near or about the middle of June.

Q. 44. Before you took his children into your summer school, did you have any conversation with him upon the subject of payment? If so, what was that conversation?

A. Nothing more than to make known in the district that, at the close of the session, I expect my pay.

Q. 45. My question relates to any conversation which you may have had with Daniel Drawbaugh before taking his children into your school.

A. Nothing direct, only what I would charge for the term.

Cross-examined by Mr. Storrow:

Cross-Q. 46. When was it that you went to Drawbaugh's shop the first time?

A. In the year 1876, on the first of February.

Cross-Q. 47. What induced you to go there then?

A. To see the machines on which he was working.

Cross-Q. 48. How did you know he was working on any machines?

A. It was the general talk in the community.

Cross-Q. 49. What machines did you hear talked about in the community?

A. The clock; the speaking-machine. These are all that I remember particularly.

Cross-Q. 50. Who had told you about the clock and speaking-machine before you went there?

A. One of my pupils, John F. Rupp, was studying natural philosophy at the time, and we spoke frequently about going to see the clock and other machines which were worked by electricity.

Cross-Q. 51. What text-book on natural philosophy did he study?

A. Cooley's Elementary, or First Book.

Cross-Q. 52. How many magnetic clocks did you see at Drawbaugh's shop on this occasion?

A. I saw one that was going.

Cross-Q. 53. Did you see any that were not going?

A. I saw the works of several.

Cross-Q. 54. Were any of these in cases, or were their works all exposed?

A. I am not able to say whether there was a case to inclose the clock that was in operation, or not. There was no face on the clock.

Cross-Q. 55. I understand, from your testimony, that you did not hear the talking-machine talk on that occasion, did you?

A. I did not.

Cross-Q. 56. I suppose you asked him to have it talk for you, did not you?

A. I did not.

Cross-Q. 57. Did not he offer to have it talk for you?

A. Not to my recollection.

Cross-Q. 58. Why did not he use it for you?

A. I can't say.

Cross-Q. 59. Did he tell you how the instrument "A" was to be used?

A. Speak into the tube, and, by means of electricity, it was to convey the word or sound.

Cross-Q. 60. Was there to be another machine at the other end for a man to listen at?

A. By what I could infer from his conversation, there was.

Cross-Q. 61. Did you see that other machine?

A. I saw other machines. I cannot identify them.

[*During the examination, the witness has had before him on the table all the instruments that have been exhibited in the case, except "C" and "I."*]

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Cross-Q. 62. How near to Drawbaugh have you lived since 1876?

A. As near as I can tell, between two miles and a half and three miles; I can't tell the distance exactly.

Cross-Q. 63. How near to Eberly's Mills is your school-house?

A. About one fourth of a mile.

Cross-Q. 64. Did you ever go to his shop between the spring of 1876 and the spring of 1879?

A. I did not.

Cross-Q. 65. Did you ever see him anywhere during that interval?

A. I did.

Cross-Q. 66. Did you ever have any conversation with him, during that interval, about his talking-machine?

A. Not to my recollection.

Cross-Q. 67. I suppose his general repute in the community was that he was always trying to get up some new thing to patent it, was not it?

A. Well, he was spoken of as a great inventor.

Cross-Q. 68. Did you see any manufacturing business going on at his shop at any time? If so, what?

A. I saw them work on clocks, but the date I can't fix. Some time after 1879—the last year, now—of 1880 and 1881. The latter part of 1880, I think, he began to manufacture faucets and the water-motor.

Cross-Q. 69. What kind of manufacturing business was being carried on there at the time when you saw "A"?

A. I saw nothing particularly, to my recollection, except the drawings of his clock, and the speaking-machine, and the telegraph. I saw the machines, too, as I stated before. There was no work carried on.

Cross-Q. 70. Which story did you see "A" on?

A. The third.

Cross-Q. 71. A telegraph you saw there had a dial and letters around it, and a pointer to spell out words, had not it?

A. Yes, sir.

Cross-Q. 72. Did he give you to understand that that was an idea of his own invention?

A. Not to the best of my knowledge.

Cross-Q. 73. I thought you said something in your direct examination about getting a patent on his telegraph.

A. I spoke to him about patenting the telegraph, and he said that the telephone—(speaking-machine he called it at that time)—would take its place.

Cross-Q. 74. When you spoke to him about patenting this telegraph, was it because you had understood from him that it was his invention, or why did you suppose that he would patent it?

A. I could infer nothing direct that it was his invention, but seeing it there, I wondered why he did not get it patented.

Cross-Q. 75. I suppose he opened the talking-machines and showed you the insides of them so that you knew how they were constructed, did not he?

A. He did not.

Cross-Q. 76. Do you know whether the inside of "A" is to-day just what it was at the time you saw it?

A. I am not positive for the inside. This [indicating electro-magnet of "A"] is the same, or constructed the same, and this tube [mouthpiece of "A"] is the same.

Cross-Q. 77. You testified in your twenty-second answer that he explained his talking-machine to you. Please to state what the explanation was that he gave you.

A. He explained the manner of conveying the sounds, principally.

Cross-Q. 78. Please state what that manner was.

A. By electricity.

Cross-Q. 79. How was the electricity to work or to operate?

A. I am not able to explain the theory.

Cross-Q. 80. Please to repeat the explanation that he gave you, or give us the substance of it.

A. I cannot explain the principle as he did.

Cross-Q. 81. Was the instrument at which you listened, in 1879, any one of those before you on the table? If so, which one?

A. I stated before I could not identify the machine particularly.

Cross-Q. 82. I suppose that before you went there in 1879, you knew that electric speaking-telephones were in general public use in the community, did you not?

A. I read of them.

Cross-Q. 83. Did you, at any time, talk with Drawbaugh about their being in general use in the community?

A. Nothing more than he said that they would take the place of the telegraph.

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Cross-Q. 84. Did you ever talk with him about the fact that you had seen in the papers that they were in general use in the community?

A. Never talked directly about the use of them in the community, more than as stated above.

Cross-Q. 85. At the time when you had the conversation, which you referred to as the one stated above, was that before or after you had been reading something about the use of the telephone in the newspapers?

A. It was in 1876, the time I saw the first speaking-machine.

Cross-Q. 86. Had you, or had you not, before that, read something in the newspapers about the speaking-telephone?

A. Not to my recollection.

Cross-Q. 87. When did you last see instrument "A", before to-day?

A. I saw a number of them last winter some time, in 1880 or the beginning of 1881, I am not able to say; among them was "A".

Cross-Q. 88. Where did you see them then, and who showed them to you?

A. I saw them in the school-room. They were shown by Mr. Jacobs, 'Squire Bowman, and Daniel Drawbaugh.

Cross-Q. 89. Did you make an affidavit then about it?

A. I did.

Cross-Q. 90. You say that he showed you his talking-machine in 1879, and said some words through it at the time you went there to dun him. He had rather a habit of showing his contrivances and talking a good deal about what he was going to do with them to people who went there to dun him, had not he?

A. He took delight in showing his inventions.

Cross-Q. 91. I suppose it occurred to you when you were dunning him that, while his children were going to school, he had put money enough into these instruments now on the table, and others you saw, to pay your bill several times over, did it not?

A. I thought he might pay me, but he claimed the money was in these things and that he was trying to get it out. That was his expression the last time I saw him.

Cross-Q. 92. And, I suppose, he wanted you to wait till he could get it out?

A. I took him to be an honest man, and he always appeared to be hard up. That is why I waited on him as long as I did.

Cross-Q. 93. Who have you talked with among your neighbors, since the beginning of 1876, about Drawbaugh's talking-machine?

A. That is a question I cannot answer. I have spoken to different parties.

Cross-Q. 94. Can't you remember any of them?

A. I spoke to a number of the pupils of my school, especially those who were with me.

Cross-Q. 95. When was that?

A. After we had visited the shop the first time in 1876.

Cross-Q. 96. How soon after?

A. On the way home, and during school time.

Cross-Q. 97. What did you tell them about it?

A. General talk among us. We thought it was a grand invention.

Cross-Q. 98. You did not know that it would talk then, except merely that Drawbaugh had told you that it would, did you?

A. No, sir, not in 1876.

Cross-Q. 99. When you say "we thought it was a grand invention," I suppose you mean you thought anything would be a grand invention which would do what Drawbaugh said this would do. Is that your meaning?

A. To convey the voice in the manner in which he explained that this would.

Cross-Q. 100. Did he state to you any particular distance which he said he had actually talked over before the spring of 1876?

A. He stated no distance prior to that time.

Re-direct by Mr. Jacobs:

Q. Q. 101. How far is Cedar Run school-house from Eberly's Mills?

A. Maybe two miles and a half on a direct line.

Q. Q. 102. And how far from Cedar Hill school-house?

A. Two miles and three quarters.

Q. Q. 103. How long did you teach at Cedar Run school-house, after the visit which you made to Daniel Drawbaugh's shop in 1876?

A. I finished my last term in 1878.

Q. Q. 104. And were you then transferred to Cedar Hill school-house?

A. I was not transferred. I took that school of my own will in preference to the one I was teaching.

Q. Q. 105. When?

A. In the fall of 1878.

Q. Q. 106. Were instruments "H" and "J" shown to you at the time your affidavit was taken, or at any time after the middle of last summer, up to to-day?

A. No, sir.

Q. Q. 107. How long before the visit which you made to Drawbaugh's shop, on February 1, 1876, did John F. Rupp tell you about Drawbaugh's talking-machine?

A. I cannot state how long. It was in the winter session of 1875-6, prior to February 1, 1876.

Adjourned until 10 o'clock, A. M., Monday, May 16, 1881.

Monday morning, May 16, 1881.

Examination resumed, pursuant to adjournment.

Present, Mr. Storrow for complainants, and Mr. Hill and Mr. Jacobs for respondents.

Examination of Mr. Hamacher continued by Mr. Jacobs:

Q. Q. 108. In your answers to questions 10 and 11, you stated that you were able to fix the date of your first visit to Drawbaugh's shop by certain report-books. Have you with you any of those books? If so, what one?

A. I have the report-book of the Cedar Hill, or Gorgas, school.

Q. Q. 109. How long has that book been in your possession?

A. I have had this report-book in my possession from near the middle of September, 1878, until March 27, 1879, and for the two consecutive winters following, and since this morning up to the present time.

Q. Q. 110. Into whose possession has it passed from time to time when it went out of yours?

A. Into the hands of the secretary of the Lower Allen school-board.

Q. Q. 111. From whom did you receive it this morning?

A. From the secretary of the school-board.

Q. Q. 112. Please state whether, when it came into your possession from time to time, it came into your possession as the teacher of the Cedar Hill school, entitled and required by law to use it for the purpose of entering your monthly reports of the business of that school.

A. It did.

Q. Q. 113. Am I then to understand that it has, since it first came into your possession, been in the possession of either yourself or the secretary of the Lower Allen school-board, for the time being, in your several official capacities?

A. As far as I know, it has.

Q. Q. 114. State whether or not the teachers in the common schools of your township are required by law to enter upon their report-books the visits of school officers and others to their respective schools?

A. There is a certificate in the report book, which we are required to sign, stating that we have taken note of the progress of the pupils and their conduct; also, of the number of visitors, such as officers and others, who have visited the school during the months, and certify that we have done so to the best of our knowledge and belief.

Q. Q. 115. Are you required to enter such visits upon your books of reports?

A. We are.

Q. Q. 116. Please turn to the report upon the book, which you now produce, for the month of February, 1876, and state in whose handwriting that report is written and by whom signed?

A. Robert Strong was teacher at that time. I would suppose it to be his hand-writing, and also signed by him.

[*The examiner is now asked to certify that the book produced by the witness contains, for the lunar month ending February* 14, 1876, inter alia, *these entries*:]

VISITS.

	Feb'y.	Length.	Spec.
Mr. D. A. Hamacher,	1	¾	1
Mr. John F. Rupp,	1	¾	1
" Sol Rupp,	1	¾	
" Joseph Rupp,	1	¾	
" E. B. Bitner,	1	¾	
" Elmer Kauffman,	1	¾	
" F. Shank,	1	¾	
" Martin Best,	1	¾	
" J. Enck,	1	¾	
" Harry Weber,	1	¾	"

[*The above constitute about one third of the visitors for the entire month of February,* 1876, *to said school, but are all entered as of February* 1.]

PHONE COMPANY,-1

CERTIFICATE.

"I certify that the foregoing report of the number of scholars belonging to school since the first of June, attendance, books used, branches taught, progress and conduct of pupils, visits of school officers and others, and of the number of days the school was in operation during the past month and term, is just and true, to the best of my knowledge and belief.

"ROBERT STRONG,
"*Teacher.*"

"*February* 14, 1876."

APPROVAL.

"Filed, examined, and approved this 25th day of March, 1876.

"JNO. C. COMFORT,
"*Secretary.*"

Q. Q. 117. What does the fraction three fourths indicate?

A. It should indicate three fourths of a day.

Q. Q. 118. Is that the length of time, according to your recollection, that you and your pupils spent at Mr. Strong's school?

A. It is.

Q. Q. 119. What time in the day did you leave the school?

A. About, between two o'clock and the middle of the afternoon.

Q. Q. 120. Did you go directly from Mr. Strong's school to Mr. Drawbaugh's shop?

A. Yes, sir.

Q. Q. 121. How long did you remain at the shop?

A. It may have been an hour and a quarter.

Q. Q. 122. And during that time you were looking around at all that was to be seen there?

A. Yes, sir.

Q. Q. 123. I observe the name "Joseph Rupp" among the visitors mentioned in your report. Is that the correct name of any pupil who was along with you? If not, what other Rupp, besides John F. and Solomon, was with you?

A. David C. Rupp is the correct name of the pupil that was with us.

Q. Q. 124. Are the other names given correct?

A. All correct but Martin Best, who is a patron of the school and did not come with us.

AMERICAN BELL TELEPHON

Q. Q. 124½. Do you mean to say that he was there on that day, but was not one of your party?

A. I did.

Re-cross-examined by Mr. Storrow:

Re-cross-Q. 125. I now understand you to say that of the three books referred to in your tenth answer, the only one that gives you any information to help you fix the dates referred to is the report-book of the Cedar Hill school, which you have produced this morning. Is that so?

A. Yes, sir.

Re-cross-Q. 126. How much of the time that day did you pass at the school, and how much at Mr. Drawbaugh's shop?

A. In the neighborhood of three fourths of a day at the school, and it may have been one hour and a quarter, at the shop.

Re-cross-Q. 127. You speak of staying there until the middle of the afternoon. Do you mean that in the middle of the afternoon you left that neighborhood, and went home?

A. Went to the machine-shop.

Re-cross-Q. 128. Then do you mean to have us understand that you and your pupils spent the forenoon and the first half of the afternoon at the Cedar Hill school, and spent the latter part of the afternoon at Drawbaugh's shop?

A. We spent the forenoon and the first part of the afternoon, at the school-house, and in the latter part of the afternoon, say an hour and a quarter, at the machine-shop.

Re-cross-Q. 129. Don't you think you went to the machine-shop at noon, between the two sessions?

A. No, sir; we did not.

Re-cross-Q. 130. Which of your pupils went to the machine-shop with you?

A. They all left the school-room when I did, but I am not positive whether they were all in the machine-shop. J. F. Rupp, Forrest Shank, Solomon Rupp, and there may have been others, I am not positive—those mentioned were in the machine-shop.

Re-cross-Q. 131. I notice that you say Mr. Strong taught the Cedar Hill school, and that the report signed by him, which you have produced, says that it was the Cedar Spring school that he taught. Which of you two is it that don't know the name of that school?

HONE COMPANY,-1

A. I said it was the Cedar Hill, or Gorgas school. The proper name is the Cedar Hill school.

Re-cross-Q. 132. I notice that this book contains reports for several years of that school, each of them purporting to be signed by the teacher of the school and the secretary of the board, and that all those reports say that it was the Cedar Spring school that he was teaching at. I suppose you mean to have us understand that he and the secretary did not know the name of the school, do you?

A. There was a dispute arose in the year of 1877, in the fall of that year, on these grounds. The superintendent of the county had advertised for an examination at the Cedar Hill school, and some of the teachers, who were going to be examined by the superintendent, went to the Cedar Run and others to the Cedar Hill, and the superintendent decided, then and there, that the Gorgas school was the Cedar Hill school. That is why I used the word Cedar Hill or Gorgas house.

Re-cross-Q. 133. Does the whole of this report book apply to the same school-house?

A. It does. It is number two house all the way through.

Re-cross-Q. 134. I observe that it is sometimes called Cedar Spring, sometimes Cedar Run, and sometimes Cedar Hill school. I wish you would tell me what, on the whole, we are to consider the correct name?

A. As the Cedar Hill or Gorgas school.

Re-cross-Q. 135. I notice that some of the reports signed by you call it the Cedar Run school. I suppose at that time you had not made up your mind what the name was. Is that so?

A. I did not know positive at that time, but the proper name now is the Cedar Hill, or Gorgas, school. It is better known in the township by that name.

Re-cross-Q. 136. In your sixth and ninth answers, and in your hundred and first to hundred and sixth answers, you distinguish between the Cedar Hill and Cedar Run schools, and say that they are two miles and three quarters apart, and that you taught at Cedar Run school in 1876, 1877, and part of 1878, and then changed and took the Cedar Hill school in the fall of 1878. Is that statement true?

A. I taught at the Cedar Run, as it was then called, as above stated, and at the Cedar Hill, or Gorgas, house, as stated.

Re-cross-Q. 137. Then, I understand that the school you taught at till the fall of 1878 is the one you have called, in your examination on Saturday, the Cedar Run school-house, and is about two miles and a half from Eberly's Mills, and that, in the fall of 1878, you moved to what, in your examination day before yesterday, you called the Cedar Hill school, which is the school where you teach now, and which is about a quarter of a mile from Eberly's Mills. Is that correct?

A. The teaching is correct. I quit the Cedar Run school at the time stated, and took the Cedar Hill school.

Re-cross-Q. 138. To make it more clear, in consequence of this confusion of names, I will ask you whether, in the fall of 1878, you began to teach, and have ever since continued to teach, at the school at which Mr. Strong taught in 1876, and which, I understand you, is known as the Cedar Hill school. Am I correct?

A. Yes, sir.

Re-cross-Q. 139. And is it the reports of that school which constitute the book you have produced?

A. That is the report of the school since the fall of 1875 up to the spring of 1881.

Re-cross-Q. 140. In the report from which you quoted in your 116th answer, I do not find any record that school kept on Tuesday, the first day of February, 1876. I wish you would point out the entry in the attendance column to show that school was open on that day. Begin first, if you please, in the boys' half, and then go to the girls' half.

A. It is an error in his count there. I fix my date from this. If that is error, I have erred.

Re-cross-Q. 141. On the boys' page I find the days written, Monday, 31; Wednesday, 2; Thursday, 3; the period covered being the lunar month ending February 14. Is that the fact?

A. As I have got it by the book, as it states I must leave it.

Re-cross-Q. 142. Does the book state as indicated in my question?

A. Yes, sir.

Re-cross-Q. 143. On the girls' page it reads as follows: "Friday, 28; Monday, 31; Monday, 1; Wednesday, 2; Thursday, 3;" does it not, except that the second Monday seems to have been first written 3, and altered to 1; or else written 1, and altered to 3?

A. As the book states I leave it.

Re-cross-Q. 144. Does not the book state as indicated in my question?

A. Yes, sir.

Re-Cross-Q. 145. I notice that the name of Mr. William R. Gorgas frequently appears among the visitors. Did he have anything to do with the school officially?

A. No, sir; not during my time of teaching in the township.

Re-cross-Q. 146. Who have you talked with in the last year about any of your visits to Drawbaugh?

A. I have spoken with Mr. Cyrus Templin, of Shiremanstown, and others.

Re-cross-Q. 147. Please to name all the others.

A. I cannot.

Re-cross-Q. 148. Please to name some of the others.

A. Quite recently I have spoken to Mr. Jeremiah Fry, John Templin, and Mr. W. H. Zearing.

Re-cross-Q. 149. Who else, within the last year?

A. I do not remember of any particularly. It has been a general talk throughout Shiremanstown.

Re-cross-Q. 150. Do you mean by that that this suit and the witnesses Drawbaugh was going to have, and the dates they were expected to swear to, have been matters of general talk throughout Shiremanstown?

A. There was nothing spoken of in my hearing about any particular witness or witnesses, or dates. It was particularly about his inventions.

Re-cross-Q. 151. What about them?

[*Objected to by Mr. Hill, so far as it relates to any other invention than the talking-machine, as being hearsay, irrelevant and immaterial, and statements so made, in conversation with others, concerning this invention, are objected to as evidence of any fact so stated, on the ground that they are hearsay.*]

A. I cannot remember the conversation.

Re-cross-Q. 152. Where did any of those conversations take place?

A. What I heard were in the stores.

Re-cross-Q. 153. Did not those conversations turn on the dates when some of these people were going to swear they had seen his machines, or heard about them?

A. They may have, but not in my hearing.

Recess for dinner, until 2.30, P. M.

Monday afternoon, May 16, 1881.

Examination resumed, pursuant to adjournment.

Same counsel present.

Re-cross-Q. 154. Do you think you have told us everybody you remember to have talked with about Drawbaugh's inventions, during this last year?

A. I could not say that I have, or that I have not.

Re-cross-Q. 155. I wish you would mention any other names that you remember.

A. I do not think I can.

Re-cross-Q. 156. Is there any reason why your memory is better about the events of 1876 than the events of last year?

A. When I first saw it, it attracted my attention more than of the last few years.

Re-cross-Q. 157. It never has occurred to you, during the last few years, as extraordinary that anybody else should have got the credit of bringing out the telephone, has it?

A. I read of the Bell telephone.

Re-cross-Q. 158. When did you first read of the Bell telephone?

A. I cannot fix the date.

Re-cross-Q. 159. About how long ago?

A. It may have been three years ago or three and a half.

Re-cross-Q. 160. Did not you have any talk with Drawbaugh about the Bell telephone at any time?

A. Not directly.

Re-cross-Q. 161. What talk did you have with him indirectly about it?

A. Nothing more than when he took my affidavit as a witness in this case.

Re-cross-Q. 162. What was the talk then between you, or in his presence, about the Bell telephone?

A. It was bearing on this suit. The words I do not remember.

Re-cross-Q. 163. What was the substance of it?

A. He asked me if I had not been in his shop and saw the speaking-machine before I taught in the fall of 1878 and 1879.

Re-cross-Q. 164. I want to know what talk you had with him then about the Bell telephone, or the substance of it, or any part of it.

A. I cannot give it.

Re-cross-Q. 165. Why is it that you remember so well a talk which you had in 1876, and cannot remember a talk which you had a few months ago?

A. It was new at that time and attracted my attention, as I stated before.

Re-cross-Q. 166. When he showed you his telephone in 1879, are you very sure that nothing was said between you about the Bell telephone, or about having seen accounts of telephones in the newspapers?

A. It would be impossible for me to endeavor to relate our conversation since the spring of 1879.

Re-cross-Q. 167. Why?

A. We met very frequently.

Re-cross-Q. 168. I do not ask you to relate your conversation. I ask you whether you did not, some time in 1879, have some conversation with him about the Bell telephone, or about having seen accounts of telephones in the newspapers?

A. I do not recollect.

Re-cross-Q. 169. When you saw him in 1879, and he showed you his telephone, did either of you say anything about the visit which you say you made there with your pupils?

A. We did not, to the best of my recollection.

Re-cross-Q. 170. When did you, for the first time, hear that Drawbaugh claimed that he had invented the telephone before Bell did?

A. I don't know for certain. It was, to the best of my knowledge, some time last fall, but I did not hear him say it.

Re-cross-Q. 171. Who did you hear say it?

[*This question, with the preceding one and the preceding answer, objected to by Mr. Jacobs as irrelevant, immaterial, and hearsay.*]

A. It was general talk.

Re-cross-Q. 172. What was the nature of this talk?

[*Same objection.*]

A. I can scarcely say.

Re-cross Q. 173. Please give us your best recollection about it.

[*Same objection.*]

A. It was general gossip, as I before said, and I paid little attention to it.

Re-cross-Q. 174. I wish you would tell us the general drift of that gossip.

[*Same objection.*]

A. I cannot give you the drift of it.

Re-cross Q. 175. Where did you hear this gossip?

[*Same objection.*]

A. At the town in which I lived—Shiremanstown.

Re-cross-Q. 176. Where in the town?

[*Same objection.*]

A. At the stores.

R-cross-Q. 177. Please to name some of the persons you heard taking part in the general gossip.

[*Same objection.*]

A. It would be useless for me to attempt that, as I paid little attention to it.

Re-cross-Q. 178. I understand, from your one hundred and thirty-second answer, that the name of school-house No. 2 was definitely fixed as Cedar Hill school, by the superintendent. in the fall of 1877. Is that correct?

A. The difference of opinion was between the school-board, and by what I could understand, the superintendent. The superintendent claimed that Cedar Hill was the right name.

Re-cross-Q. 179. Do you mean that Cedar Hill was the recognized name for it, from and after the fall of 1877, and that was why you applied that name to it?

A. The superintendent claimed that Cedar Hill was the right name.

Re-cross-Q 180. Will you tell me, if you have any recollection at all on the subject, when it was that that school-house acquired the name of Cedar Hill school?

A. I think that was the right name always—Cedar Hill, or Gorgas.

Re-cross-Q. 181. It has always appeared that the teacher and the secretary called it Cedar Spring in 1876. Do you, or do you not, know when it began to go by any other name; and if so, when?

A. I was always under the impression that it was the Cedar Hill, or Gorgas, school-house.

Re-cross Q 182. But that impression of yours seems to have been contrary to the official designation given to it by the teacher who taught it and the secretary who had charge of it, was not it?

A. Yes, sir.

Re-cross-Q. 183. What was the name of the superintendent referred to in your one hundred and thirty-second answer?

HONE COMPANY,-1

A. D. E. Kast.

Re-cross-Q. 184. Will you explain to me why it is that all your reports for the first year after you went there, and until report dated November 18, 1879, call it the Cedar Run school? Please look at them and see if it is not so.

A. I cannot say why I did that.

Re-cross-Q. 185. Did you call it Cedar Run because you always believed its name was Cedar Hill, and because the superintendent, in the fall of 1877, officially decided that its name was Cedar Hill?

A. My general impression was that Cedar Hill, or Gorgas' school, was the right name. Why I wrote that I cannot say.

Re-cross-Q. 186. I notice that your report, which begins in the middle of October, 1879, is the first one that calls it Cedar Hill school. Don't you think that it was in that fall that the superintendent officially decided that its name was Cedar Hill?

A. The secretary, W. H. Zearing, required me to call it Cedar Hill school, as that was the right name. Prior to that, John C. Comfort was secretary, and said nothing about it.

Re-cross-Q. 187. And I suppose that, as you always understood that its right name was Cedar Hill, and knew that the superintendent had decided that that was its right name in 1877, you required a special order to make you call it by its right name; is that the case?

A. He told me to write it Cedar Hill.

[*The reports are as stated in the one hundred and eighty-fourth and one hnndred and eighty-fifth questions.*]

Re-re-direct by Mr. Jacobs:

Q. Q. Q. 188. Please state whether or not the schools in Lower Allen township are designated by number as well as by name.

A. They are.

Q. Q. Q. 189. What is the number of the school which was taught by Mr. Strong in January and February, 1876, and taught by you since the fall of 1878?

A. Number two.

[*At the request of respondents, the examiner certifies that upon its title-page the book produced by witness appears to be the book of reports for school No. 2, Lower Allen township, Cumberland county, and that all the monthly reports in said book appear to be for Lower Allen district, Cumberland county, school No. two.*]

Q. Q. Q. 190. Please state whether both of the school-houses referred to in your testimony are not located upon the banks of, or near to, the same small stream?

A. They are.

Q. Q. Q. 191. What is the name of that stream?

A. Cedar Run.

Q. Q. Q. 192. And has that fact been the cause of the confusion in the name of the two schools?

A. It may have. I can't say positively.

Q. Q. Q. 193. What is the number of the school-house in which you taught during the winter of 1875–'6?

A. It was then No. 4. It is now No. 3, as Shiremanstown has withdrawn, and forms a separate school-district.

Q. Q. Q. 194. How long did John F. Rupp continue in your school, after you made the visit to Drawbaugh's shop, in company with him and other pupils?

A. It may have been three weeks.

Q. Q. Q. 195. Did he continue in your school beyond that winter?

A. He did not.

Re-re-cross-examination by Mr. Storrow:

Re-re-cross-Q. 196. In going from Mechanicsburg to the Gorgas school-house, do you pass through Shiremanstown?

A. Yes, sir.

Re-re-cross-Q. 197. Does that road also pass by Eberly's Mills?

A. No, sir; in driving from Shiremanstown to the Gorgas school, you do not pass through Eberly's Mills.

Re-re-cross Q. 198. About how far beyond the school are Eberly's Mills?

A. About one fourth of a mile.

Examination taken, reduced to writing, and by the witness subscribed and affirmed to before me, this 16th day of May, 1881.
FRED. M. OTT,
Examiner.

D. A. HAMACHER.

JOHN F. RUPP, *being produced, affirmed, and examined, saith:*

Examined by Mr. Jacobs:

Q. 1. State your age, residence, and occupation.

A. Twenty-six years; residence, one mile south of Shiremanstown; occupation, florist.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Penna.? If so, how long have you known him?

A. I have known him about ten years, or more, as near as I can tell.

Q. 3. You have heard the testimony of Mr. D. A. Hamacher, who has just left the witness-stand, with regard to a visit made to the shop of Daniel Drawbaugh, by him, in company with yourself and other pupils. Do you remember that visit, and if so, when, to the best of your recollection, was it made?

A. I do; it was made in the year 1876, during the early part of February.

Q. 4. How do you fix the date in the early part of February?

A. Because it was not long before I quit schooling.

Q. 5. When did you quit schooling?

A. In the year 1876.

Q. 6. What part of the year 1876?

A. Near, or about, the close of February.

Q. 7. How old were you at that time?

A. A few weeks over twenty-one years.

Q. 8. Did you ever attend a common school after the close of February, 1876?

A. No, sir.

Q. 9. Upon the occasion of that visit to Drawbaugh's shop, did you see any talking-machines there?

A. Yes, sir; I saw machines, which he told us were talking-machines.

Q. 10. Please look at instrument marked "A," and state whether you saw it there on that occasion?

A. I saw a machine similar to it, or this machine [taking up "A"].

Q. 11. Did he explain it to you, or in your presence?

A. I heard no particular explanation, more than it was worked by electricity. The conversation was altogether between Mr. Drawbaugh and Mr. Hamacher. I was not with them all the time.

Q. 12. You have said that he called it a talking-machine. Did he say how far he could talk with it?

A. He stated no particular distance, as to how far he could talk then, but he said that he could have it so perfected that he could speak to San Francisco.

Q. 13. Did you see, then and there, any other talking-machines besides instrument "A" ?

A. Yes, sir; he showed us this one ["F"].

Q. 14. Was it then in about the same condition that it is now ?

A. Its general appearance was about the same.

Q. 15. How long was the party in the shop ?

A. I cannot tell exactly, but about an hour and a half.

Q. 16. Did you look at other things there besides the talking machine ?

A. I did.

Q. 17. Did you see the talking-machine immediately after you went inro the shop, or after you had been looking at other things ?

A. No, sir; I saw several others before.

Q. 18. Did you see there an instrument for telegraphing, and, if so, did you see it before or after the talking-machine ?

A. Yes, sir; before.

Q. 19. What time in the day were you at the shop ?

A. I cannot fix the hour, but it was about the middle of the afternoon.

Q. 20. Where had you spent the former part of that day ?

A. At Mr. Strong's school.

Q. 21. How far from Eberly's Mills ?

A. About one fourth of a mile.

Q. 22. How much of that day had you spent at Mr. Strong's school ?

A. The greater part of the forenoon and about an hour and a half or less in the afternoon.

Q. 23. What was the occasion of your being absent from your own school and visiting another on that day ?

A. The school-board having new desks put in the school-room on that day, there was no school.

Q. 24. Do you mean at the school which you were attending and Mr. Hamacher teaching ?

A. Yes, sir.

Q. 25. Where was that ?

A. At the school that is best known as Frogtown school.

Q. 26. Was it also known as the Cedar Run school ?

A. Yes, sir.

Q. 27. Had you had any conversation with Mr. Hamacher about Drawbaugh's talking-machine before you made that visit in company with him and others to Drawbaugh's shop?

A. Yes, sir.

Q. 28. Then you knew of Drawbaugh's talking-machine before, did you?

A. I had heard of it.

Q. 29. Were you walking during that visit?

A. Yes, sir.

Q. 30. How far did you and the rest of the party have to walk in order to get home after leaving Drawbaugh's shop?

A. I walked about three miles, and some of the others the same distance. I believe we were the furthest, that walked—a couple of us.

Q. 31. How far was Cedar Run, or Frogtown, school-house from Drawbaugh's shop?

A. About two and a half miles, or a little farther.

Q. 32. Have you ever been to Drawbaugh's shop since that day?

A. I have not.

Cross-examined by Mr. Storrow:

Cross-Q. 33. Please state all the machines of Drawbaugh's manufacture or invention that you saw at his shop on that visit.

A. The electric clock, telegraph, fire-alarm, and the talking-machine.

Cross-Q. 34. Did not you see any others?

A. Not that I remember of.

Cross-Q. 35. What kind of a thing was the telegraph that you saw?

A. It was a dial with letters around the edge, having a hand or needle in the center.

Cross-Q. 36. Did you understand that Drawbaugh had invented that?

A. He did not say whether he did or not, but I thought he did invent it.

Cross-Q. 37. And did you think that he had invented the fire-alarm, too?

A. Yes, sir.

Cross-Q. 38. How many electric clocks did you see there?

A. I remember of seeing one.

Cross-Q. 39. Only one?

A. That is all.

Cross-Q. 40. What kind of business was being carried on in the shop—what things were being manufactured?

A. I cannot tell what the manufacture then was.

Cross-Q. 41. What manufacture was carried on at his shop at any other time?

A. Manufacture of faucets and pumps.

Cross-Q. 42. When was that?

A. I can't fix any date or year.

Cross-Q. 43. Who, besides Drawbaugh, carried on that faucet and pump business there?

A. It was carried on by the Drawbaugh Manufacturing Company.

Cross-Q. 44. When did you last see either of the instruments "F" or "A," before to-day?

A. On last Saturday,

Cross-Q 45. When last before that?

A. Some time during last winter.

Cross-Q. 46. Who showed them to you then, and where?

A. Mr. Drawbaugh, at my home.

Cross-Q. 47. Have you made an affidavit about these instruments?

A. Yes, sir.

Cross-Q. 48. Please state all that you heard Drawbaugh say about the talking-machine, on the occasion of your visit with Mr. Hamacher?

A. He said it was worked by electricity; would take the place of the telegraph, and that he could make it so that he could talk to San Francisco.

Cross-Q. 49. Have you ever had any other talk with him about his talking-machine, between that time and the time last winter?

A. No, sir; I did not see him often.

Cross-Q. 50. How far have you lived from his shop since the spring of 1876?

A. About three miles.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me this 16th day of May, 1881.
FRED. M. OTT,
Examiner.

JOHN F. RUPP.

Adjourned until May 17th, at 10 o'clock, A. M.

May 17, 10, A. M.

Examination resumed, pursuant to adjournment.

Present, Mr. Hill and Mr. Jacobs for respondents, and Mr. Storrow for complainants.

H. B. MUSSER, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. My age is forty-one; residence, Camp Hill, Cumberland county; occupation, farmer.

Q. 2. Are you acquainted with Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Penn'a; and, if so, how long have you known him?

A. I have known him about twenty years, since a short time after he made that patent stave-jointer.

Q. 3. Have you ever been at his shop at Eberly's Mills?

A. Yes, sir; I have.

Q. 4. State whether, during any visit to his shop, you ever saw any talking-machines there; and, if so, when you first saw them?

A. I saw them in 1874, on the twenty-seventh day of June.

Q. 5. How do you fix the date?

A. I had my reaper repaired there—fixed.

Q. 6. Did you make any entry in writing in a book, about the repair of the reaper at that time?

A. Yes, sir.

Q. 7. Have you the book here?

A. Yes, sir; I have the book here.

Q. 8. Please show the book to the examiner, and point out the entry, in order that he may copy it on the record.

A. This is the entry here.

[*The entry shown to the examiner is as follows:*

"27 *Moewing fix*, 60"

The examiner certifies that the above entry occurs on a page which is headed:

"*June*, 1874. *Cost on the farm*."]

Q. 9. State whether or not that book is the book which you kept entering up, day after day, your farm accounts, expenses, profits, &c.

A. Yes, it is.

Q. 10. Please look at the instruments now shown you marked "F" and "B," and state whether you ever saw them before to-day, and, if so, when and where you first saw them?

A. Yes, sir; I saw them in Drawbaugh's shop in 1874, the 27th day of June.

Q. 11. Did anybody talk through them at the time when you first saw them?

A. Yes, sir.

Q. 12. Who talked and who listened?

A. Mr. Drawbaugh talked and I listened.

Q. 13. Where was he when he was talking, and you, when you were listening?

A. He was in the north room and I was in the south, and there was an entry between those rooms that went into the machine-shop.

Q. 14. Were the two instruments connected in any way? If so, how?

A. They were connected with a wire.

Q. 15. Did you hear and understand what he said through the instrument?

A. Yes, sir.

Q. 16. Did you have any conversation at that time with Mr. Drawbaugh about the instrument?

A. Yes, sir.

Q. 17. Did he tell you how far he could talk through it? If so, what did he say?

[*Objected to as leading.*]

A. Yes; he told me he was going to make a machine to talk from Harrisburg to Philadelphia, and he said it would be a cheaper and quicker way than telegraphing. I could hardly believe my own conscience that he could do so.

Q. 18. Did he tell you what the principle of the machine was—whether it operated by electricity or not?

[*Objected to as leading.*]

A. Yes, sir; he told me it would go by electricity. He told me he wanted to make it quicker than telegraphing.

Q. 19. In that conversation, was anything said about electric conductors? If so, what?

[*Objected to as leading.*]

A. Yes, sir. He told me there was a high conductor and a low conductor, but I could not understand his low conductor or his high conductor,

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and I do not understand it at the present day. He showed me there something that he had—low conductor and high conductor—and two things flattened together, using his hands, with the palms together, to show me, [thus,] and called it a low conductor, and the one raised a high conductor. I understood it in that way. He explained it in that way to me, but I could not understand it.

[*The witness in illustration, in the course of his answer, presses the palms of his hands together.*]

Q. 20. Did you ever see talking-machines at Mr. Drawbaugh's shop, after that visit? If so, when did you next see them?

A. Yes, sir; I saw them in 1876, in June.

Q. 21. How came you to be at his shop in June, 1876?

A. I took my reaper down there to get one of these patent spindles put on the pitman rod.

Q. 22. Have you an entry of that in your book also?

A. No, sir; at the time I paid—settled with it—I have. I settled with Captain Moore.

Q. 23. How long after you got that work done did you settle for it?

A. I settled on the 29th day of August, 1876.

Q. 24. Please hand your book to the examiner in order that he may copy it upon the record.

[*The entry shown is as follows:*

"29 *J. A. Moore, pd. fix mowing machine,* 19.25."

The heading of the page bears the dates "August" and "1876."]

Q. 25. Your book-entry showing the payment in 1876, how do you fix June as the time when you took the machine there to be fixed?

A. I wanted to get it fixed before I commenced making hay.

Q. 26. About what time does the hay-making season begin in your neighborhood?

A. From the 17th to the 22nd of June we generally commence; it depends a good deal upon how the weather is. Last year I was done making hay on the 21st of June.

Q. 27. At that visit, when you went to get your mowing-machine fixed, in June, 1876, did Mr. Drawbaugh show you the same instruments "B" and "F" that you had seen before?

A. No, sir.

Q. 28. Please look at the instrument "A" now shown you, and state whether you ever saw that before to-day, and if so, when and where you first saw it.

A. No; I never saw this.

Q. 29. Please look at the instruments "D" and "E," now shown you, and state whether you ever saw them, or either of them, before to-day; and if so, when and where you first saw them?

A. Yes, I saw this one [taking up "D."] I saw this one in 1876, in June, when I brought my reaper to the shop.

Q. 30. Did anybody talk through it at that time?

A. Yes, sir.

Q. 31. Who talked through it, and who listened?

A. Drawbaugh talked to me and I listened.

Q. 32. Did you hear and understand what he said through the instrument?

A. Yes, sir.

Q. 33. Did you talk any through the instrument?

A. No, sir; I did not.

Q. 34. Where were you and Mr. Drawbaugh when he was talking and you listening through that instrument?

A. I was in the same room as I was at first—when he first spoke to me. He was in the north room.

Q. 35. Were you quite well acquainted, or but little acquainted, with Mr. Drawbaugh when you first went there in 1874 to get your mowing-machine fixed?

A. I was very little acquainted with him. I knew him, and that was about all.

Q. 36. In either of those conversations, in 1874 or 1876, was anything said by him about patenting the invention? If so, what?

A. No, sir.

Q. 37. Was anything said about his financial means?

A. No, sir.

Cross-examined by Mr. Storrow:

Cross-Q. 38. How long have you lived at Camp Hill?

A. I have lived there since 1852.

Cross-Q. 39. How far is your house from Drawbaugh's shop?

A. Two miles and a half.

Cross-Q. 40. Have you ever been at his shop since June, 1874, more than once?

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A. Yes; I have been there several times before now.

Cross-Q. 41. What have you been there for, those several times?

A. I lost the spool off of one of those spindles. That caused me to go there so often.

Cross-Q. 42. Who did the repairs on your reaper, on the first visit you have mentioned?

A. Mr. Drawbaugh.

Cross-Q. 43. How long did it take him?

A. It did not take him long.

Cross-Q. 44. What else did you see at his shop besides his talking-machine on that occasion?

A. He had clocks there. He had a kind of a machine there,—he said he wanted to make a fire-alarm; and then he had a kind of a machine there he made to wrap wire, somehow; and then he was making a belt, he called it electric belt. That is all I recollect.

Cross-Q. 45. By wrapping wires, do you mean winding wires with thread like the green wound wires on "B?"

A. Yes, sir.

Cross-Q. 46. How many clocks did you see there in 1874?

A. There was three clocks there in 1874.

Cross-Q. 47. Describe them.

A. One was a clock that he had finished to go by electricity, extending the wires into the earth; and another that he had was not finished; another was an old eight-day clock that he had there.

Cross-Q. 48. What kind of a case did the finished clock have?

A. It was a longish one; pretty near all one glass in front. You could see all the works.

Cross-Q. 49. How tall was it?

A. I could not tell you how tall it was exactly; it was as tall as the ceiling was from the floor, pretty near.

Cross-Q. 50. Did he explain the clock to you, how it worked?

A. Yes, sir.

Cross-Q. 51. Did he explain to you how the other things worked, that you have mentioned?

A. No, sir.

Cross-Q. 52 What time of day was it when you were there?

A. I can't tell you that positively.

Cross-Q. 53. Forenoon or afternoon?

A. That is more than I can tell you; I can't recollect that.

Cross-Q. 54. What else had you been doing that day?

A. I could not recollect that either.

Cross-Q. 55. How long did it take you to carry your machine down to his shop and get it mended and go home again?

A. I do not know how long. If he could do it right away, it would take about a half a day, or a quarter.

Cross-Q. 56. Did he do it right away, or was he busy at something else, so that you were kept waiting?

A. That I do not know.

Cross-Q. 57. Who went there with you?

A. No one.

Cross-Q. 58. Who did you see there on this first visit?

A. No one but Mr. Drawbaugh.

Cross-Q. 59. Was any manufacturing business going on in the shop at that time?

A. I do not know exactly, but I most think they were working at the faucets.

Cross-Q. 60. Did not you see any men at work there, besides Drawbaugh?

A. No, sir; no one there but Drawbaugh and I.

Cross-Q. 61. Had you been to Harrisburg, to market, that same day, when you saw "B" and "F?"

A. No, sir.

Cross-Q. 62. Had you been to Harrisburg for any purpose that day?

A. No, sir; my wife had been to market. In hay-making and harvest my wife goes to market, still, with my father—in right busy times.

Cross-Q. 63. Was that a busy time?

A. Yes, sir.

Cross-Q. 64. I suppose you had plenty of leisure to stop and hear a man with whom you were little acquainted tell you about things you did not understand, and which you had no particular interest in; did not you?

A. I don't understand the question.

[*Question re-read.*]

A. Yes, I would.

Cross-Q. 65. Was Dr. Musser, of Mechanicsburg, a relation of yours?

A. Yes, sir.

Cross-Q. 66. What relation?

A. First cousin.

Cross-Q. 67. He was one of the company that made faucets at Drawbaugh's shop, was not he?

A. Yes, sir.

Cross-Q. 68. Have you ever had any conversations with Drawbaugh about his talking-machines, except on the two occasions referred to?

A. No, sir.

Cross-Q. 69. Never spoken with him at all on the subject, since 1876?

A. Not till last week, one day, they were there. That is the first ever I heard anything about it.

Cross-Q. 70. Where did you see him last week?

A. At my home.

Cross-Q. 71. When you got your reaper mended, in 1876, was Captain Moore's Kline axle company carrying on business at Drawbaugh's shop?

A. Yes, sir.

Cross-Q. 72. In what story of the mill were the rooms referred to in your thirteenth answer?

A. In the second story, counting the basement as one. There was still another story above the one I was in.

Cross-Q. 73. Did you see the clocks on the same story?

A. Yes, sir.

Cross-Q. 74. Please make a little drawing of how that story was partitioned off.

[*Witness makes one, which is marked* " *Musser's diagram.* "]

Cross-Q. 75. When you had the talk with instrument " D, " did you use " D, " or did he use it?

A. I used this.

Cross-Q. 76. What did he use?

A. I cannot tell you.

Cross-Q. 77. When you saw "B," was the electro-magnet on it the same that is on there now, or was it a bigger one?

A. To the best of my knowledge, there was something over this here [indicating the open end of the tube of " B " next to the electro-magnet.] The electro-magnet was the same as it is now, to the best of my recollection.

Re-direct by Mr. Hill:

Q. Q. 78. When you were in Mr. Drawbaugh's shop after 1876, what were you there for?

A. I lost one of the spools off of the patent spindle that I had.

Q. Q. 79. Did you lose that spool off more than once?

A. Yes, sir.

Q. Q. 80. Were all your visits there after 1876 for the purpose of getting that spool repaired or put on again?

A. Yes, sir.

Q. Q. 81. Would you get it repaired and go right away again or would you remain after the work was done?

A. No, sir; I did not remain after the work was done. I hurried away.

Q. Q. 82. Was that spool on your mowing-machine?

A. It was on the pitman rod that drives the knife.

Q. Q. 83. Could you use the machine with the spool off, or with that thing off, whatever it was, that you went there to get put on?

A. Not very satisfactorily; you could not. We have shifted, by wrapping wire around to keep it to its place.

Q. Q. 84. Would that spool come off while mowing?

A. Yes, sir.

Q. Q. 85. Was it, or was it not, during your busiest season on the farm that that accident was liable to happen?

A. Yes, sir; it was.

Q. Q. 86. When you went to the shop in June, 1874, and saw the two machines "B" and "F," do you remember which one Mr. Drawbaugh had in the room where he was talking, and which one you had in the room in which you were listening?

A. To my best knowledge, this machine "B" is the one I had.

Q. Q. 87. When you went to the shop in June, 1876, to get the spindle put on your harvester, who put it on?

A. Drawbaugh.

Q. Q. 88. Did anybody help him?

A. Not as I know of.

Q. Q. 89. Was there any one at work in the shop at that time besides Drawbaugh? If so, who?

A. Yes, sir; George Drawbaugh.

Q. Q. 90. Were Daniel Drawbaugh and George Drawbaugh the only men at work in the shop at that time?

A. As far as I know, that is all that I saw in the shop at that time when I was there. That is all that I saw working there.

Q. Q. 91. In cross-answer seventy-seven, you say "there was something over this here," [indicating the open end of the tube "B"] next to the electro-magnet. Do you remember the appearance of that "something" which was over the end?

A. It looked a good bit like this here tissue paper or a hog bladder; something that color. It was very thin.

Re-cross by Mr. Storrow:

Re-cross-Q. 92. What was it you heard through these instruments—what words, if any?

A. I could not recollect.

Re-cross-Q 93. When you got the spindle put on to your harvester, was Dan Drawbaugh working on his own account, or was he in the employ of the spindle company?

A. He was employed in the spindle company, for he told me to pay Captain Moore. I had asked him what the bill was.

Re-re-direct examination by Mr. Hill:

Q. Q. Q. 94. Is that all you know about his being employed by the spindle company?

A. As far as I know.

Q. Q. Q. 95. In re-cross-answer ninety-two, you say you could not recollect what it was you heard through the instrument—what words. Do you recollect that you heard words through it?

A. Yes, sir.

Q. Q. Q. 96. Did you hear any whispering, singing, or other sounds through it?

A. No, sir.

Q. Q. Q. 97. Did Drawbaugh tell you something through it, or ask you a question? Do you remember about that?

A. No, sir; I don't know what he asked me.

Q. Q. Q. 98. Then all you remember is that he talked through the machine to you, and that you heard and understood him. Is that so?

[*Objected to as leading and assuming.*]

A. That is all I remember.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 17th day of May, 1881.

FRED. M. OTT,
Examiner.

HENRY B. MUSSER.

[*Mr. Abraham came in during the examination.*]

Adjourned for dinner until 2.30, P. M.

May 17, *afternoon session.*

Examination resumed, pursuant to adjournment.

Present, Mr. Storrow for complainants, and Mr. Hill, Mr. Abraham, and Mr. Jacobs for respondents.

ISAAC B. MILLARD, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. I am thirty six years old; residence, Newberry township, York county; I am a farmer.

Q. 2. Have you ever had any mechanical trade or occupation besides farming? If so, what?

A. I worked at house carpentering and as a mill-wright here in Harrisburg about eight years, and, altogether, about fourteen years.

Q. 3. Have you been a member of the school-board in your township, and president of it?

A. Yes, sir.

Q. 4. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Penna.? If so, how long have you known him?

A. I have known him, I guess, nearly ever since I was quite a small boy—nearly since I knew anybody.

Q. 5. What was the date of your marriage?

A. November 11. 1869.

Q. 6. Prior to the time of your marriage, where did you live?

A. I had my home with my father, at Camp Hill, over here; but I lived a while, shortly before I was married, at Ezra Gilbert's, at Eberly's Mills.

Q. 7. About the time of your marriage, did you go anywhere else to reside? If so, where?

A. I had been working here in Harrisburg, from the latter part of July until the next summer before I was married; then I went to Ohio, and came back about the beginning of November, to Camp Hill, where my mother lived, and I was married. I considered Camp Hill as my residence, and voted there. My father died in the fall of 1868, while I was working in Harrisburg, before I went to Ohio.

Q. 8. Where were you married?

A. In Harrisburg.

Q. 9. After your marriage, where did you reside, and how long?

A. I resided in Harrisburg from about the beginning of December, 1869, when I went to housekeeping here, until August 20th, 1874.

Q. 10. Where did you go to reside on August 20th, 1874?

A. I moved to where I now live and have lived there ever since.

Q. 11. Did you purchase a farm about that time when you went to reside there?

A. No, sir; my father-in-law bought the farm and I moved on it to farm it.

Q. 12. Can you state when you or your father-in-law got the deed for that farm?

A. The farm was bought on the 15th of August, 1874, five days before I moved there, and he was to have a deed on the first of April, 1875, clear of all incumbrances; but during this time it became evident that the estate of Michael Strominger, deceased, from whose executor it had been bought, was insolvent, and the farm was sold a second time, by order of court, April 26, 1875—if my memory serves me—when my father-in-law again bought it and got the deed a few days afterwards

Q. 13. Were you ever in Mr. Drawbaugh's shop, at Eberly's Mills, prior to your marriage?

A. Yes, sir.

Q. 14. Please look at the machine "B," now shown you, and state whether you ever saw it before to-day, and if so, when and where you first saw it.

A. Yes, sir; I have seen it before, or something similar. I seen it in Drawbaugh's shop. It was somewhere between the time I lived at Mr. Gilbert's—between 1867 and 1869, when I first saw it.

Q. 15. Then it was prior to your marriage, was it?

A. Yes, sir.

Q. 16. How came you to see it then?

A. I hardly know how to word that answer. I was very frequently back and forwards at the shop while I lived at Gilbert's, and frequently I was there afterwards. I don't know exactly how often up to the time I was married.

Q. 17. During that time, up to the time you were married, did you see it more than once? If so, how frequently?

A. I seen it several times, but how often I would not be able to say.

Q. 18. Did you see it used before you were married?

A. Yes, sir.

Q. 19. Where, and how?

A. They had "B" in the shop, and the attachment they had to the wire or string—I don't remember whether it was a wire or string. We listened to this here [indicating the end of the box "B" farthest from the electro magnet].

Q. 20. Do you mean that they had something connected with the box "B" by a wire or string?

A. Yes, sir.

Q. 21. Where was the person who was talking to the machine while you were listening?

A. Some distance away, at the other end, with some kind of an instrument. I don't remember what kind of an instrument he spoke in. I don't remember whether I went to see it.

Q. 22. Did you hear and understand what was said through the machine?

A. Yes, sir.

Q. 23. Do you remember on what floor of the shop the instrument "B" was, when you listened at it?

A. The second floor.

Q. 24. Was the other man who talked into the machine on the same floor, or on another floor?

A. He was out on the bank.

Q. 25. About how far from the shop was he, to the best of your recollection?

A. It has been so long since I have been there—I would presume it is about fifty yards.

Q. 26. Did the wire or string run out of the shop on to the bank or hill where he was?

A. Yes, sir.

Q. 27. Who was out there on the bank talking into the instrument?

A. That I don't remember, whether it was Mr. Drawbaugh or some one of the young men who were with us. There might have been a couple of them.

Q. 28. While you were living in Harrisburg, before you moved on to the farm, were you in Mr. Drawbaugh's shop frequently or not?

A. No, sir.

Q. 29. About the time you moved on to the farm, were you there more frequently?

A. Yes, sir.

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Q. 30. Did you see any talking-machines there about that time?

A. Yes, sir.

Q. 31. Please look at these machines, some dozen or more, now shown you, and see if you find any of the machines that you saw about that time.

[*Witness picks out of the basket machines "A," "D," "E."*]

A. This one here, marked "A," had two wires attached to these here posts, and you listened at this hole, [indicating mouth-piece.] I recognize this one ["K"] as one that I have seen, and I have seen this one ["M."] I have seen these two, ["D" and "E,"] or something similar.

Q. 32. You say that the instrument "A" had two wires attached to the screw posts, and that you listened at the funnel or ear-hole. Who was talking into the machine when you listened at that instrument "A?"

A. Mr. Drawbaugh.

Q. 33. Where was he, and where were you at that time, when he was talking and you listening?

A. He was below in the shop, in the lower part. I was above in the upper story, or second story above the basement.

Q. 34. Did you hear and understand what he said?

A. Yes, sir.

Q. 35. You say you saw these two instruments "D" and "E," or something like them. Was any conversation carried on through those two instruments "D" and "E?"

A. Yes, sir.

Q. 36. Who carried it on?

A. Mr. Drawbaugh and I.

Q. 37. While the conversation was going on, where was Mr. Drawbaugh and where were you?

A. There was one instrument at one end of the shop and the other across the furthest end of the building; I don't know which instrument was at each place. These are the machines ["D" and "E,"] or something similar. He had them attached by means of a wire across the building.

Q. 38. Do you remember whether they were in the same room or different rooms?

A. No, sir; I don't.

Q. 39. Did you listen at one of the instruments, or talk into it, or both listen and talk?

A. Both listened and talked.

Q. 40. When you talked, was it into the same instrument at which you had just listened?

A. Yes, sir.

Q. 41. Did you find that you could carry on a conversation with Mr. Drawbaugh so as to be understood by him and to understand him when he spoke to you through the instruments?

A. Yes, sir.

Q. 42. Now, when these instruments, "A," "D," and "E," were thus used by you and Mr. Drawbaugh, as you have testified, about how long was it after you had moved on to the farm, to the best of your recollection?

A. This one ["A"] I saw first. Now, the time that I was in the shop, I was going from Harrisburg, here, back and forth to Lewisberry, during the spring and summer of 1874, and after I moved on the farm—in 1875—I was going back and forth to Mechanicsburg. It was during some of those visits that I made that I saw these three instruments, "A," "D," and "E."

Q. 43. How came you to be going back and forth between the farm and Mechanicsburg in 1875?

A. I was going to visit my sister.

Q. 44. Were you in the shop quite a number of times in 1874 and 1875?

A. I suppose something like three or four times. I remember of stopping there once to see him when he was not at home.

Q. 45. Do you remember when the Centennial Exhibition opened at Philadelphia?

A. Sometime in May, 1876, I think.

Q. 46. Do you remember your last visit to Mr. Drawbaugh's shop before the opening of the Centennial?

A. It was sometime before that.

Q. 47. Do you mean that your last visit to the shop, before the Centennial, was sometime before the opening of the Centennial?

A. Yes, sir; sometime before the opening of it.

Q. 48. Was it warm or cold weather, at the time of that last visit before the Centennial?

A. It was cold weather.

Q. 49. Did you see those instruments, "A," "D," and "E," at the time of that last visit, before the Centennial, or at an earlier time than that?

A. It was not later than that that I saw these two, "D" and "E," first. I saw "A" before that.

Q. 50. At the time or times before the Centennial, when you saw "A," and "D," and "E," did you see the old instrument that you had seen in 1869?

A. Not that I recollect of.

Q. 51. Please state again the time when you moved on to the farm.

A. August 20, 1874.

Q. 52. Then, in your 42d answer, you meant that in 1875 you were going back and forth to Mechanicsburg?

A. Yes, sir.

Q. 53. Now, after that last visit to the shop, in cold weather, before the Centennial, when were you next at Mr. Drawbaugh's shop?

A. I don't remember of being there till somewheres in February or the beginning of March, 1880

Q. 54. How came you to go there then?

A. I took my uncle, William Walter, up to see Mr. Drawbaugh.

Q. 55. Did you see Mr. Drawbaugh?

A. Yes, sir.

Q. 56. Did you see any more talking-machines at that time?

A. Yes, sir.

Q. 57. Please look at the fifteen or more talking-machines in the baskets now before you and on the table, and see if you see any of the instruments that you saw there during that visit to Mr. Drawbaugh's shop, in the winter or early spring of 1880, and, if so, point them out to the examiner.

A. I saw these two, "K" and "M," at that time, but he did not use them more than he was taking them apart, and was explaining the principle that they worked on; and I also seen one of these up against the wall. It was the one with the bell on—this one, [indicating "H."] I think I saw "J," but am not positive. He showed me several instruments, the inside of one of which resembles the inside of "J." I designate the other one ["H"] by the bell; that I know I saw.

Q. 58. Did you, at that time, hear any one talk through any of the talking-machines?

A. No, sir.

Q. 59. When Mr. Drawbaugh showed you his talking-machines, at various times from 1868 or 1869 down to 1880, as you have testified, did he, at such different times, explain them, or try to explain them, to you?

A. He told me several times what principle they worked upon.

Q. 60. What did he tell you about it?

A. He told me that it was done by means of electricity.

Q. 61. Did he tell you how the sound was conducted by electricity, or try to explain it to you?

A. Yes, sir.

Q. 62. State what you remember of the words that he used in making these explanations.

A. I can't just give exactly the language that he used, more than part that I remember; that by means of certain conductors, I understood him, would form a battery. We were at that time speaking of conveying sound through water by a wire. He had that instrument "H" up against the wall, and a wire running down into the water. He had been experimenting; but the wires were torn down and the instruments were not in operation when my uncle and I called there.

Q. 63. What water was it?

A. The Yellow Breeches creek.

Q. 64. Did he say what kind of conductors?

A. He was speaking of a high conductor and a low conductor that would perform certain parts of the work, or have certain effects, I don't just remember which. He was getting a little deeper into philosophy than what I can comprehend.

Q. 65. What was the first time when you ever heard him speak of high conductors and low conductors, in connection with talking-machines?

A. I don't distinctly recollect of him speaking of high and low conductors more than the last visit, when my uncle and I were there.

Q. 66. Have you any impression on your memory as to his speaking of them before that time?

[*Objected to.*]

A. No, sir.

Q. 67. Do you recollect the circumstance, that during one of your visits to Mr. Drawbaugh's shop, a portion of an instrument dropped out and fell on the floor?

A. Yes, sir.

Q. 68. When was that, and what instrument was it, to the best of your recollection?

A. It was a machine of something of this description, [holding up "O" and "G"]. It was a diaphragm; he spoke of it. It was dark, and did not look like brass, such as these. It might have been corroded. I would not say what kind of metal it was.

[*The witness, after taking off the covers and taking out the diaphragms of several instruments, after giving his above answer, finally comes to instrument "L," and, taking out the diaphragm and holding it bottom up, says: "Here it is."*]

I recognize the peculiar-shaped irons inside. As near as I can recollect, it was in 1880, the last visit that I made. He was explaining the way the sound would vibrate in here. He had opened several instruments that he had experimented with. He was explaining to my uncle. There was none of them, at that time, in operation. The wires were all down, pretty much.

Q. 69. In your conversations with Mr. Drawbaugh about the talking-machine, prior to your marriage, was anything said about the distance to which he could talk through it?

A. Not that I remember of.

Q. 70. Was anything said about that during your visits to the shop in 1874 and 1875?

A. Yes, sir.

Q. 71. What was it?

A. By his conversation, I was under the impression that he meant a machine to take the place of the telegraph.

Q. 72. Was anything said by Mr. Drawbaugh, during your several visits to the shop, with respect to patenting the invention? If so, what was said, and when?

A. He always left me under the impression that he wanted to have it patented as soon as he could secure the means; that he was not able to carry the thing through.

Q. 73. What was your information about his financial condition from 1869 down to 1880?

A. As far as I knew, it was about all he could do to make a living, with his experimenting that he was doing, and scarcely could do that.

Q. 74. I understood you, that at one time you saw the interior of the instrument "K"; am I correct?

A. This looks very much like a machine I saw. It had a pulley inside like this, and had two wires attached here to the two small posts. This I seen the time my uncle amd I was there. He was explaining whether one would have the better effect by having the curved magnet placed at the side, like the one in "K," or when placed in the bottom, as in "L." I was under the impression that there was a small knob on this long wire on "K," to turn the pulley inside.

Cross-examined by Mr. Storrow:

Cross-Q. 75. Please state all that Drawbaugh said to you and your uncle on the occasion of the visit of you and your uncle to Drawbaugh's shop, in addition to what you have already stated, in regard to talking-machines.

A. In regard to talking-machines, when we first got there he was showing us that large machine, "H." It was up, and he got to telling us that he was trying to get up a machine that he could talk across the Atlantic ocean. He was explaining it, and my uncle put the question to him whether sound would not lose every certain distance. Then he got to explaining to him how that this could be avoided, and got to speaking of his high and low conductors, and different materials that would form a battery, and then he got deeper into philosophy than I could comprehend. I did not pay much more attention to it, but thought they might go ahead.

Cross-Q. 76. Was there anything more said about talking-machines that you did comprehend, in addition to what you have already testified?

A. No, sir; just what I said before.

Cross-Q. 77. Where does your uncle live, and what is his business?

A. In Washington Territory. I don't know whether he follows any particular business. He owns a large tract of timber land, and raises a great deal of fruit, and ships it to Olympia.

Cross-Q. 78. Where was he living at the time of that visit to Drawbaugh's shop?

A. He had his home in Washington Territory. He was in here on a visit, and stayed about six months, I suppose.

Cross-Q. 79. Who did he stay with?

A. He was visiting the whole of his relatives. He did not have any particular place to stay.

Cross-Q. 80. What did you and he go to Drawbaugh's for on that occasion?

A. He was inventing a machine that some of the parts were not altogether clearly plain to him, and he went up there for advice.

Cross-Q. 81. When you listened at instrument "A," what instrument was the other person talking into?

A. I don't know exactly whether it was one of these other instruments or not [picking up "O" from among the others]. This ["A"] was the one I listened to. I recognize it by this hole at the side.

Cross-Q. 82. Did you see the one that the other person talked into?

A. I saw it, but I don't remember that of examining it close, more than they told me I should listen there [pointing to "A"] and they would speak into the other.

Cross-Q. 83. Was it a wooden instrument, something similar to these before you?

A. I took it to be a wooden instrument, something similar to that [picking up "O"].

Cross-Q. 84. When did you last see any of these instruments before this week?

A. Mr. Drawbaugh came down through our neighborhood last winter some time, and he had a few of them along, and asked me if I recognized any of them.

Cross-Q. 85. Did you make an affidavit then for him?

A. No, sir.

Cross-Q. 86. Were not you at any time asked to make any affidavit for him?

A. He or Mr. Jacobs asked me whether I would have any objections to making an affidavit, and I told him that I would not have any objections.

Cross-Q. 87. What other inventions, besides the speaking machine, has Drawbaugh experimented on since you first knew him?

A. That is a pretty hard question to answer.

Cross-Q. 88. Hard because there are so many, or because there are so few?

A. There have been a good many of them—so many that I can't recollect them all. I can mention some, but I am satisfied that I can't mention all the machines.

Cross-Q. 89. Please mention all that you do recollect.

A. The stave-jointer, stave-cutter, nail-feeder, tack-machine, faucets, and, whatever they call it, spindle-bush. He was figuring on a swing on an engine (the time the Government offered that reward for

AMERICAN BELL TELEPHON

the smallest steam-engine) and a pump; and he was experimenting with the same thing to make a fire-engine; his clock, electric clock, and his telephone.

Re-direct by Mr. Hill:

Q. Q. 90. Were the most of those things prior to 1869?

A. All but the clock and telephone. Those are all that I have seen, I believe, since that.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 17th day of May, 1881.
FRED. M. OTT,
Examiner.

ISAAC B. MILLARD.

Adjourned until May 18th, at 10 o'clock, A. M.

Wednesday, May 18, 1881, 10, A. M.

Examination resumed, pursuant to adjournment.

Present, Mr. Storrow for complainants, and Mr. Hill, Mr. Abraham, and Mr. Jacobs for respondents.

JOHN C. SMITH, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. Age, twenty-nine; residence, Steelton, Dauphin county, Pa.; occupation, machinist.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pa.? If so, how long have you known him?

A. Yes, sir; I could not exactly tell. Ever since I was a child.

Q. 3. Where and how were you employed from April 1, 1872, to April 1, 1873?

A. I was employed by the Pennsylvania Railroad Company, as fireman on a locomotive, on a schedule called "Tyrone Coal," between Harrisburg and Tyrone.

Q. 4. How do you fix the time of such employment?

A. By my time-book.

Q. 5. Have you your time-books here, and have you referred to them for the purpose of fixing the time?

A. Yes, sir.

Q. 6. What engine were you firing during that year?

A. Engine No. 502.

Q. 7. While you were firing that engine, No. 502, on what days of the week were you at work and on what days idle?

A. I was at work on the six regular working days of the week, and idle on Sunday.

Q. 8. Where and how did you generally spend your Sundays during the year that you were firing that locomotive?

A. Generally at home with my parents, and with Daniel Drawbaugh in his shop.

Q. 9. Were you in Drawbaugh's shop most every Sunday during that year, or not?

A. Nearly every Sunday.

Q. 10. Was his shop open on Sunday, or locked?

A. Generally locked.

Q. 11. How did you get in when it was locked?

A. I would rap, or call, or sometimes climb in the window.

Q. 12. How long were you in the habit of staying in the shop with Drawbaugh, on Sundays, when you would go there?

A. Sometimes an hour, and sometimes longer.

Q. 13. Did you see any talking-machines in the shop while you were there on those Sundays?

A. Yes, sir.

Q. 14. What was generally going on in the shop on Sundays, when you were there?

A. Talking and experimenting.

Q. 15. Experimenting with what?

A. Sometimes talking-machines, and sometimes he had other experiments.

Q. 16. What were the greater part of his experiments upon?

A. Talking-machines.

Q. 17. What were those experiments? Explain how they were carried on.

A. An old glass tumbler with a cover over it, and a tin box with a magnet attached to it.

Q. 18. Please look at the instruments "B" and "F," now shown you, and state whether you ever saw them before to-day; and, if so, when and where you first saw them, or either of them.

A. I have. I saw them during the year I was firing coal train. In Daniel Drawbaugh's shop.

Q. 19. Are they the instruments with which the experiments were carried on that you referred to?

A. They look like them.

Q. 20. Did you hear any talking carried on through those instruments during that year?

A. To the best of my knowledge, I did.

Q. 21. Who talked, and who listened, when you heard the talking through them?

A. Daniel Drawbaugh talked, and I listened.

Q. 22. In what part of the shop was he, when so talking, and in what part of the shop were you, when so listening?

A. He was in the south-eastern, and I was in the north-western part of the shop, down stairs.

Q. 23. Were you both on the same floor, or on different floors?

A. On different floors.

Q. 24. What floors were you and he on, when talking through the instruments?

A. He was on the third, and I on the second; that is, counting the basement as the first floor.

Q. 25. Which one of the two instruments did you listen at, and which one did he talk into?

A. I listened at the tin box with the magnet attached to it. I suppose he talked into the tumbler.

Q. 26. Were the two instruments connected? If so, how?

A. Yes, sir; with two copper wires.

Q. 27. Explain how the wires extended from one point to another, and how they were supported.

A. They were run up to the ceiling, or beams, that ran across: and they then ran across, on those timbers, to the north-west corner of the shop, and then down through the floor to the room where I was.

Q. 28. How many times, during the year that you were firing the locomotive on the coal train, did Mr. Drawbaugh talk through the machines to you, as you have testified?

A. I could not state—frequently.

Q. 29. Do you know why he talked frequently through the machines to you?

A. I suppose to experiment,—to make it better.

Q. 30. Was that your understanding, at the time?

A. That was my understanding—experimenting to make it better.

Q. 31. When he would talk to you through the machines, how would he know that you heard what he said?

A. He would holler down and ask me, and I would go to the stairs and holler up what he said.

Q. 32. Do you recollect what kind of mouth-piece or mouth-pieces this tumbler "F" had on it at that time?

A. I can't recollect right; I think it had a flat cover on.

Q. 33. Do you mean a flat cover on the mouth of the tumbler under the mouth-piece?

A. It had a flat cover on somewhere; I can't recollect right.

Q. 34. Do you recollect anything about his having different mouth-pieces or making changes in the mouth-pieces?

A. Yes, sir.

Q. 35. Did he say why he was making those changes or trying those different mouth-pieces?

A. I can't remember.

Q. 36. When you would go to the stairway and tell him what you had heard through the instruments, do you remember what he would say from time to time?

A. "That's right," or "that's it," or "that's what I said."

Q. 37. Do you recollect whether or not, on any of those Sundays, he would make any changes in the machine and then ask you to listen in order to see how they operated as thus changed?

A. Sometimes.

Q. 38. Did he try to explain the instruments to you during that year and to explain how they operated?

A. Yes, sir.

Q. 39. Do you remember what his explanation was?

A. No, sir.

Q. 40. Did you, during that year, hear him say anything about electric conductors? If so what?

A. I remember of him having a needle suspended by a string, and explaining about the different electric conductors.

Q. 41. What kind of conductors did he speak of?

A. High conductors and low conductors and non-conductors.

Q. 42. Did he say anything, during that year, about how far he could talk through those instruments? If so, what?

A. Said he believed they could talk for a hundred miles.

Q. 43. Have you been in his shop since that year? If so about how often, to the best of your recollection?

A. I have, but I could hardly tell how often.

Q. 44. Have you been there every year since, down to 1880?

A. Yes, sir.

Q. 45. In the time from April, 1873, to the beginning of 1880, take the year that you were there the least number of times, and state how many times you would feel safe in saying that you were there that year.

A. About a half dozen times.

Q. 46. Is your father still living there, at or near Eberly's Mills?

A. No, sir.

Q. 47. When did he move away from there?

A. I think in the fall of 1878.

Q. 48. As you would be there in Mr. Drawbaugh's shop, from time to time, from April, 1873, till your father moved away, did you, from time to time, or did you not, see other talking-machines there?

A. Yes, sir; I did.

Q. 49. Please look at these machines, now shown you, marked "A," "D," "E," "G," "I," "K," "L," "M," and "O," and state whether you recognize any of them as having been seen at Drawbaugh's shop before your father moved away; and if so, point out to the examiner the particular instruments which you remember.

A. I remember this one [taking up "A"] as a particular one, and this here one ["D"]. I remember talking through "A" and "D," or some that looked like them. I saw other instruments resembling all those, [referring to the others named in the question,] after 1873.

Q. 50. When the talking was going on through instrument "A," who used it, and how?

A. We both used it, but not at one time, for listening. One would talk while the other would listen. We would change about. Daniel Drawbaugh and myself, I mean.

Q. 51. How near can you fix the time when you used the instruments "A" and "D?"

A. I can't fix the time for using them.

Q. 52. I understand you that it was before your father moved away. Is that right?

A. Yes, sir.

Q. 53. Have you any recollection as to whether it was a long time before your father moved away or not.

A. I have not.

Q. 54. Please look at these two instruments, "H" and "J," now shown you, and state whether you ever saw either of them at Mr Drawbaugh's shop before your father moved away?

A. I don't remember whether I did. I saw them after they moved away.

Q. 55. Where was the instrument "H" at the time when you recollect of seeing it first?

A. Fastened up against the wall.

Q. 56. Did you talk, or hear anybody talk, through either of the instruments "H" or "J?"

A. Yes, sir.

Q. 57. Both, or one; and, if only one, which one?

A. This one, "H."

Q. 58. Which of those two instruments did you see first?

A. "H."

Q. 59. What is your recollection as to how long it was after your father moved away before you saw instrument "H?"

A. I can't recollect how long it was after.

Q. 60. How long have you lived at Steelton?

A. I moved there September 9th, 1880.

Q. 61. Where did you live last before you moved to Steelton?

A. At 1222 Wallace street, Harrisburg.

Q. 62. How long did you live in Harrisburg before you moved to Steelton?

A. About nine years—boarding, keeping house, and all.

Q. 63. How long did you keep house here in Harrrisburg before you moved to Steelton?

A. About five years.

Q. 64. When were you married?

A. The 24th of January, 1875.

Q. 65. How have you been employed at Steelton since you have resided there?

A. Running lathes and a shaping-machine in the machine-shop of the steel-works.

Q. 66. How were you employed during the time when you kept house here in Harrisburg?

A. Firing and running a locomotive.

Q. 67. How were you employed between April, 1873, and the time when you went to keeping house?

A. Firing a locomotive.

Q. 68. The same locomotive that you were employed on from April, 1872, to April, 1873, or another?

A. Another.

Q. 69. After April, 1873, were you at leisure on Sundays while you were firing a locomotive, or did your schedule require you to work on Sundays?

A. The schedule required me to work 'till nine or ten o'clock on Sunday morning.

Q. 70. What was the route of your locomotive after April, 1873?

A. The same, only some thirteen or fourteen miles farther. I ran on Union Line freight, and we went on to Altoona instead of Tyrone, as before. We hauled special freight.

Q. 71. Were you at Drawbaugh's shop much on Sundays after you went on the special freight train?

A. Not much on Sunday.

Q. 72. Do you know what Mr. Drawbaugh's financial condition was between April, 1872, and the time when your father moved away?

A. I know he hardly ever had any money. He owned a property in Mechanicsburg, but besides that, he did not have any money. He partly owned the property in Mechanicsburg. He did not have it all paid for.

Q. 73. Do you recollect of his applying to you for a small loan of money? If so, state the circumstance.

A. One time I was over there and a man came there to collect a bill of two dollars, I think. He told the man he did not have a cent, and asked me whether I would not lend him two dollars.

Q. 74. Did you lend him the two dollars; and if not, why not?

A. No, sir; because I just did not have it, and because I thought, if I gave it to him, I would never get it back again.

Q. 75. Do you mean that you did not have two dollars in your pocket at the time, or that you did not have two dollars to spare and not get it back?

A. I just did not have it in my pocket.

Q. 76–77. And what made you think that if you lent him two dollars, you would never get it back again. Was it because he was not honest, or because he was always so hard up?

[*Objected to as leading.*]

A. He was honest enough, but he was always hard up.

Recess for dinner, until 2 o'clock, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Q. 78. Have you any record of the time that you were running on the locomotive 502?

A. Yes, sir.

Q. 79. If you have it with you, please produce it.

[*Witness produces a small pass-book.*]

Q. 80. I notice that there are twenty-one pages written on, prior to the page upon which you say is the first record of your time on engine 502. To what do these pages refer?

A. They refer to my working elsewhere.

Q. 81. Commencing at what date and ending when?

[*Question objected to because the entries in the book should speak for themselves, if the book is relied on for any purpose.*]

A. Commencing March 20, 1871, and ending March 31, 1872.

Q. 82. Now, from April 1, 1872, in whose handwriting are the entries?

A. My own.

Q. 83. When was that book purchased, and by whom?

A. As near as I can tell, it was purchased March 21, 1871, by myself.

[*The time-book referred to is offered for inspection of counsel on both sides.*]

Q. 84. Does that book contain a memorandum of every day you worked on engine 502?

A. It does; for eleven months, up to the first of March, 1873. After that, the account was kept in another book, which I also produce for inspection.

Q. 85. Does that second book contain a memorandum of all the time you worked on engine 502 not included in the first book submitted?

A. Yes, sir.

Cross-examined by Mr. Storrow:

Cross-Q. 86. What other inventions, besides the talking-machine, has Drawbaugh experimented on since 1878?

A. I don't know.

Cross-Q. 87. Do you know that he has ever experimented on any invention except that?

A. Yes, sir.

Cross-Q. 88. What ones? State such of them as you can recollect.

A. Nail-feeding machine, self-feeders, rotary pumps, molasses faucets, hydraulic rams. That is all I can just think of.

Cross-Q. 89. Do you consider him much of an inventor?

A. I do.

Cross-Q. 90. I wish you would think of the names of some of the other things that he has invented.

A. Stave-cutters, stave jointers, and a carpet-tack machine, and a gas governor.

Cross-Q. 91. Did he ever make any inventions relating to the business you used to be engaged in—locomotives or steam-engines?

A. Not that I know of.

Cross-Q. 92. What work was being carried on at his shop when you first saw "B" and "F?"

A. I don't remember.

Cross-Q. 93. What other things of his did you see at the shop at that time?

A. I don't recollect. I don't think there was any other going on just at the time.

Cross-Q. 94. Why was Dan always hard up? Did he drink, or was he lazy, or what was the matter?

A. He spent the most of his time experimenting; that is the reason why, I thought, he was hard up. He was always sober and industrious.

Cross-Q. 95. Is he a good workman?

A. First-class.

Cross-Q. 96. Was he a man who could have got good employment and good pay around here if he had a mind to?

A. He told me they sent for him to come to Philadelphia different times; that they would give him five dollars a day.

Cross-Q. 97. When was it that he asked you to lend him two dollars and you did not?

A. I can't tell exactly.

Cross-Q. 98. Please tell as near as you can.

A. It was while I was railroading; that is about as near as I can get at it.

Cross-Q. 99. Was it before you were married, or after?

A. I could not say.

Cross-Q. 100. If I understand your testimony, you have kept house and boarded in Harrisburg and Steelton from the early part of 1872 to the present time. If not, where have you boarded during that time?

A. That is all right.

Cross-Q. 101. You say that during the period when you and he were using "F" and "B," from time to time, Drawbaugh was experimenting to make it better. Did he make it better during that time?

A. I think he did.

Cross-Q. 102. You think you heard better at "B" during the last part of the time than you did at first?

A. Yes, sir.

Cross-Q. 103. Much better?

A. Well, better, anyhow.

Cross-Q. 104. But, on the whole, you think that, although he was trying to make them better, he did not get them better during that time. Is not that so?

[*Objected to as assuming exactly contrary to what the witness has stated.*]

A. I think he did improve it—make it better.

Cross-Q. 105. But you think it was very little better, don't you?

[*Objected to as assuming, and for the same reason as the preceding objection.*]

A. I think it was better.

Cross-Q. 106. When did you last see any of these instruments before this week?

A. I could not exactly say when.

Cross-Q. 107. State as near as you can.

A. Last fall.

Cross-Q. 108. Who showed them to you?

A. Mr. Jacobs. Mr. Drawbaugh was along.

Cross-Q. 109. Where was it?

A. At 1222 Wallace street, Harrisburg.

Cross-Q. 110. Have you ever made an affidavit about them ?

A. Yes, sir.

Examination taken, reduced to writing, and by the witness subscribed and affirmed to before me, May 18, 1881.

FRED. M. OTT,
Examiner.

JNO. C. SMITH.

LEVI CHARLES STEINBERGER, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. I was born in 1830. I reside now in Perry county. I am farming now. I am a miller by trade.

Q. 2. Are you acquainted with Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Penna.? If so, how long have you known him?

A. I have known him since 1871.

Q. 3. Did you at one time reside at Eberly's Mills? If so, when did you begin to reside there, and how long did you continue to reside there?

A. I moved there in 1871, February the first. In October of the same year I moved away again.

Q. 4. State whether you have ever been in Mr. Daniel Drawbaugh's shop at Eberly's Mills since you moved away from that place in October, 1871.

A. No, sir.

Q. 5. Were you in his shop while you lived at Eberly's Mills?

A. Yes, sir.

Q. 6. When you were in his shop, at that time, did you see anything there which he called a talking-machine?

A. Yes, sir.

Q. 7. Please look at the two machines now shown you marked "B" and "F," and state whether you ever saw them before to-day, and if so, state when and where you first saw them.

A. I have seen them in his shop, while I lived at Eberly's Mills.

Q. 8. Who showed them to you there?

A. Hiram Drawbaugh. His right name is Harman Drawbaugh, a nephew of Daniel Drawbaugh.

Q. 9. While you lived there at Eberly's Mills, did you have any talk with Daniel Drawbaugh about his talking-machine?

A. Yes, sir.

Q. 10. Did he tell you how far he could talk through it?

A. Yes, sir.

Q. 11. Did you hear anybody talk through it?

A. No, sir.

Q. 12. Did he or Harman Drawbaugh tell you that it had been used to talk through?

[*Objected to as incompetent.*]

A. Yes, sir.

Q. 13. Did they tell you how far they had talked through it?

A. Yes, sir.

[*Same objection.*]

Q. 14. How far did they say they had talked through it?

[*Same objection.*]

A. Suppose this was the machine-shop; they had talked up to the upper story.

Q. 15. How far did Mr. Drawbaugh say he could talk through it?

[*Same objection.*]

A. He said if it was in operation, he could talk to me up at the grist-mill, from his shop.

Q. 16. How far was the grist-mill from his shop?

A. I don't suppose it was a quarter of a mile; I could not exactly say. Somewhere in the neighborhood of a quarter of a mile.

Q. 17. What business were you engaged in while you lived at Eberly's Mills?

A. I was running the Eberly mills.

Q. 18. Was that the grist-mill Drawbaugh said he could talk to from his shop?

A. Yes, sir.

Q. 19. When did you next see these two machines "F" and "B"?

A. Last fall.

Q. 20-1. Who showed them to you last fall, and where was it?

A. Mr. Drawbaugh and Mr. Jacobs, at my place.

Q. 22. State whether you had ever seen Mr. Drawbaugh from the time you lived at Eberly's Mills until he and Mr. Jacobs visited you at your place last fall.

A. No, sir.

Q. 23. What time in the fall was it that they visited your place?

A. I think in November.

Q. 24. Do you recollect whether there was snow on the ground or not?

A. Yes, sir; there was snow.

Q. 25–6. Please look at the two instruments now shown you, marked "C" and "I," and state whether you ever saw them, or either of them, before to-day, and if so, when and where you first saw them.

A. I seen them in Drawbaugh's shop when I seen the others.

Q. 27. When did you next see them after that?

A. Not 'till to-day.

Q. 28. Where did you see them first to-day?

A. This one I seen over yonder at Mr. Jacobs' office, [indicating "I"]; this one [indicating "C"] I did not see until I came into this room here.

Q. 29. Was this instrument, "I," in Mr. Jacobs' office when you first went in there this afternoon?

A. No, sir.

Q. 30. Was it brought in while you were there?

A. Yes, sir; I asked to see it.

Q. 31. State whether or not, when looking at the instruments "F" and "B" in Mr. Jacobs' office, this afternoon, you said there was another instrument that you saw there, at the shop in 1871, and described this box "I," so that Mr. Drawbaugh came and got it for you.

[*Objected to as incompetent.*]

A. Yes, sir; that is so.

Cross-examination waived.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 18th day of May, 1881.

FRED. M. OTT,
Examiner.

L. C. STEINBERGER.

Adjourned until ten, A. M., May 19th, 1881.

PHONE COMPANY,-1

May 19, 1881, *ten*, A. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

DANIEL FETTROW, *being produced, sworn, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. Fifty-one years on next July 24th; reside at Eberly's Mills. I am a blacksmith.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Penna.? If so, how long have you known him?

A. I have known him personally since the fall of 1865.

Q. 3. Where is your blacksmith-shop? Is it at Eberly's Mills, and if so, how far is it from Drawbaugh's shop?

A. It is at Eberly's Mills, and about four hundred yards from Drawbaugh's shop.

Q. 4. How long have you occupied it as a blacksmith-shop?

A. Since 1866.

Q. 5. Do you recollect doing any work for Wilson Bear at about the time he was commencing to make axles at Drawbaugh's shop?

A. I did work for him March 26th, 1875.

Q. 6. Was that the first work you did for him?

A. Yes, sir.

Q. 7. How do you fix the date?

A. By the charge made in my book.

Q. 8. If you have your book here, please show it to the examiner so that he can copy it on the record.

[*Witness produces his book of accounts and turns to pages which he says are in his handwriting. These pages contain an account headed* "*W. Bear & Co.,*" *which the witness says means Wilson Bear & Co. Said account contains charges every few days, of bolts, iron, cast-steel, and blacksmithing work. The first date given is March* 26, 1875, *and the account extends on various pages through the entire year* 1875. *Witness says the account then went into the name of another company, and he points to another page headed* "*Captain Moore,*" *containing an account of blacksmithing work and materials, the first date in which is May* 12, 1876. *The last entry in said account on said page is in September*, 1876.]

A. (Witness testifies.) Moore was winding up the axle business in the summer of 1876. Wilson Bear was not the inventor of these axles.

His father-in-law, Jacob Kline, was. Wilson Bear run it for a while, 'till his money gave out and he could not carry it on. Then Captain Moore took possession of all there was there and wound up the business. It was while Captain Moore was winding up the concern that I made the charges against him. Captain Moore was the superintendent, or something, at the academy at Camp Hill.

Q. 9. Did you purchase some real estate from Daniel Drawbaugh during the time covered by your last answer?

A. Yes, sir.

Q. 10. Do you remember when you got the conveyance of that real estate?

A. I got the deed April 1, 1876.

Q. 11. Did you move on to the property at that time?

A. I moved out of one house into the other at the time when I got the deed. I lived on the property before that.

Q. 12. Do you remember about what time it was when you agreed with Mr. Drawbaugh to buy that property from him?

A. Yes, sir.

Q. 13. When was it, as nearly as you can remember?

A. August before I got the deed; August, 1875.

Q. 14. About the time that you came to that agreement, or understanding, with Mr. Drawbaugh, that you would buy the property, you were in his shop, occasionally, I suppose, were you?

A. Yes, sir; often.

Q. 15. Did you ever see any talking-machines in his shop?

A. Yes, sir.

Q. 16. State how he come to show you the talking-machines the first time you saw them.

A. The time that Bear was starting this axle machinery Drawbaugh was rather counted as the head man of getting up the machinery; that is, putting up the shafts, and Drawbaugh came to me and told me to come down to the shop, to show me to make some levers, and I went down. After he had showed me how they were to be made, and I was just in the act of leaving the shop, he said to me, "Oh, Daniel! see here," and he went on ahead, around into another apartment of the shop; then he showed me this machine, which was then called the talking-machine amongst us at home there. Then he showed me how to hold it to my mouth and to my ear, and then he went around into another room, and then he spelled Harrisburg; after he was done with that he sang notes. Then I said into this machine, "All right," then he came back to me.

Q. 17. Did you distinctly hear and understand him when he was spelling and singing into the machine?

A. Yes, sir.

Q. 17½ When he came back to you, did he say whether he heard you, when you said "All right" into the machine?

A. Yes, sir; he did.

Q. 18. Please look at the machines now shown you, marked "A," "B," "C," "D," "E," "F," "G," "H," "I," "J," "K," "L," "M," "N," "O," and see if you find the machines by which you and Mr. Drawbaugh talked to each other at that time, as you have testified.

A. Figures were not mentioned at that time, but there was a curl on like that [taking up "D."] I would not just positively say that is the one, but it was just like that. Now here is one [taking up "E"] that when you take the lid off is just the same way, so that I could not positively say.

Q. 19. Do you remember whether the instrument Mr. Drawbaugh talked into was like the one you listened at, or did you see the instrument he talked into?

A. No, sir; I did not see that one.

Q. 20. I understand you that you used the same instrument to listen at and to speak into. Am I correct?

A. Yes, sir.

Q. 21. How did the size of that instrument compare with the size of this instrument "D"?

A. As near as I can tell, it was the same size. It had a mouth-piece the same as that.

Q. 22. State what conversation you and Mr. Drawbaugh had about the talking-machine at that time.

A. After he had talked to me through the machine, he came back to where I was, and he said that this would go ahead of telegraphing. He said then that if I would want to telegraph to anybody, I would have to pay so much a word, and with this machine (meaning the speaking-machine, as we called it then) I could, for five, six, eight, or ten cents, speak myself to the man or person that I would want to talk to myself, and it would be cheaper than telegraphing.

Q. 23. Was anything said at that time about how far you could speak with this machine?

A. Yes, sir; he said I could speak ten, fifteen, or twenty miles, or even to California, if there was a wire extended.

Q. 24. Was anything said at that time about patenting the invention? If so, what?

A. Yes, sir; I asked him whether he had a patent, and he said not. He said he had not the money, but he said he had talked to a couple of men to go in with him to get it patented.

Q. 25. Why did you not go in with him at that time to get a patent on it?

A. Because I had not the money just in my hand to pay it over.

Q. 26. You had heard his talking-machine spoken of in the neighborhood before, had you?

A. Oh, yes.

Q. 27. What did people say about it?

A. Called it tom-foolery.

Q. 28. Do you recollect whether you saw these two instruments, "B" and "F," at the shop at or about that time?

A. This here one I seen. I don't know whether he called it "B" or "F," but that one I saw [indicating "B"]. I have no positive recollection of the other. I might have seen it. [The witness picks up instrument "F," and then says:] I did see that; I remember it after picking it up.

Q. 29. Do you recollect whether you saw this instrument "C" at the shop at any time? If so, when, to the best of your recollection?

A. I can't positively say that I seen that.

Q. 30. Do you recollect at any time seeing this large box "I" at the shop? If so, when, to the best of your recollection?

A. I seen one standing on the counter or bench, after I talked with the speaking-machine; some time afterwards,—I don't mean the same day.

Q. 31. Do you recollect whether at any time you saw this instrument "A" at the shop? If so, when, to the best of your recollection?

A. I have saw a machine lying on the bench like that, too—mouth-piece—with that peculiar-shaped mouth-piece, and some with round mouth-pieces I could not tell you when; it was after we talked together. I never paid no attention before we talked together. I did not see it before that.

Q. 32. Do you mean you did not see the talking-machine until the time when you talked together, as you have testified?

A. I never had seen the talking-machine 'till that time.

Q. 33. From that time when you talked together down to the begining of the year 1880, were you, or were you not, frequently in Mr. Drawbaugh's shop?

A. Yes, sir.

Q. 34. As you would be there from time to time during those years, from the summer of 1875 to the beginning of 1880, did you, or did you not, see other talking-machines that you had not seen in the summer of 1875?

A. Yes, sir.

Q. 35. How often do you think you were in the shop during the year 1876?

A. I might have been there once a month, and maybe once a week for a while. I was back and forward pretty often, as business called me to go there.

Q. 36. How often in the year 1877?

A. About the same as before. Whenever business called me there, I went there.

Q. 37. How often in 1878?

A. I can't answer any other way but the same. Whenever business called me to go to see him for some certain purpose, I went.

Q. 38. And would make the same answer as to the year 1879?

A. Yes, sir.

Q. 39. Please look at this machine "H," having the bell on top of it and the tapering box, and state whether you ever saw it at Mr. Drawbaugh's shop; and if so, give your best recollection as to the time you first saw it.

A. Oh, yes; I have often seen it there. It was after me and him done the talking through the machine that I first saw it. After we done the talking together, and I came into the shop and seen any of those round or oblong mouth-pieces, I took it at once to be a talking-machine.

Q. 40. Did you see a good many machines around there with mouth-pieces, from time to time?

A. Yes, sir.

Q. 41. As you would be in there from time to time during the years 1875, 1876, 1877, 1878, and 1879, would Mr. Drawbaugh generally be doing something to the talking-machines, or with the talking-machines, or not?

A. Yes, sir.

Recess for dinner until 1.45, P. M.

Examination resumed, pursuant to adjournment.

Q. 42. Were you ever in his shop at night when he was there?

A. Yes, sir; but not so often.

Q. 43. About how often, so far as you remember?

A. Maybe once or twice a month. I am not so often out at night; generally at home.

Q. 44. What did you find Mr. Drawbaugh giving his attention to when you were there at night?

A. More on the telephone, or speaking-machine, I should say, than any other thing.

Q. 45. How late did you stay with him, at any time, when he was working on the speaking-machine?

A. As late as ten o'clock at night.

Q. 46. Did he, when you were there at night, give any reason for working on it at night?

A. Yes, sir.

Q. 47. What reason did he give?

A. He said that he could work better at that at night; that his mind was not confused so much with other things as, through the day.

Q. 48. Do you recollect when the electric clock company were making clocks there at his shop?

A. Yes, sir.

Q. 49. Were you in his shop from time to time while the clock-making was going on there?

A. Yes, sir.

Q. 50. Did he show you any speaking-machines there during that time, while the clock company were at work?

A. Yes, sir.

Q. 51. That was about the year 1878, was it not?

A. Yes, sir; somewhere thereabout. If I had my other book here I would give you the exact date when I done the first work for them.

Q. 52. Did you ever do any work for Mr. Drawbaugh in connection with the talking-machines?

A. Yes, sir.

Q. 53. What do you recollect of doing for him?

A. Forging magnets; that is, it was done in my shop through me and my hands.

Q. 54. Did you understand at the time that some of those magnets were for talking-machines?

A. Yes, sir.

Q. 55. You rented a house from Mr. Drawbaugh for some time, did you not?

A. Yes, sir.

Q. 56. From what time to what time did you rent such house?

A. From 1868, eight years following.

Q. 57. 'Till you purchased the house that you live in?

A. Yes, sir.

Q. 58. Was it a house for two families?

A. Yes, sir.

Q. 59. I judge from your testimony that when you bought the house you moved out of one tenement into the other. Is that the fact?

A. Yes, sir.

Q. 60. Was the blacksmith-shop also a part of the property that you rented from him?

A. Yes, sir.

Q. 61. And when you bought, did you buy both tenements and the blacksmith-shop—the whole property?

A. Yes, sir; I bought him out entirely.

Q. 62. What yearly rent did you pay for the property while you rented it?

A. The first year I paid him eighty dollars. The next seven years, a hundred and ten a year.

Q. 63. Will you explain how that rent was generally paid to Mr. Drawbaugh during the time that you occupied that property as tenant?

A. Through work and money paid to him and other persons. I don't know how you would put it.

Q. 64. Do you remember how often you used to settle and balance up the accounts between you?

A. Every year, with the exception of the first year.

Q. 65. When you would settle and strike a balance, how would the balance stand—always in his favor or sometimes in yours?

A. Sometimes in mine—overpaid him.

Q. 66. Did you keep a book account showing what you let him have along from one year to another?

A. Yes, sir.

Q. 67. Have you the book here, and will you produce it and show it to the examiner?

A. Yes, sir.

Q. 68. Please point out to the examiner, so that he can enter upon the record, the various items of money and other things that you let Mr. Drawbaugh or his family have, and charged it on the rent account, during those years that you rented the property from him.

A. Here they are on the following pages: 19, 27, 35 in the first book, and 25, 50, 78, 115, 133, 157 in the second book.

[*Mr. Hill requests the examiner to make and certify to the court, as* "*Exhibit Fettrow account,*" *an exact copy of the account between the witness and Mr. Drawbaugh contained in the books here presented.*]

Q. 69. Please explain the account which I see in the books under the name of "Drawbaugh Pump Co."

A. That was a separate company. The first account mentioned was Drawbaugh's private account.

Q. 70. In Drawbaugh's private account, I observe that you have charged him at many different times with beef, lard, wood, veal, potatoes, coal, corn, butter, flour, and similar articles. Did you keep those articles for sale; and if not, please explain how you came to furnish them to Mr. Drawbaugh or his family?

A. No, sir; I did not keep them for sale, because I have got to buy all myself that I need; because he had not the money, and he came to me to get them for him was the reason I supplied them.

Q. 71. Then you would go and buy them, and furnish them to him and charge them to his account; was that the way it was done?

A. Yes, sir.

Q. 72. Did he always come to you for those articles himself or would his wife sometimes come?

A. His wife sometimes came.

Q. 73. I observe in one or more places on the account, small items of cash charged as "cash to Ellen." Who was Ellen?

A. His wife—called Ellcetta, but I called her "Ellen" for short.

Q. 74. How did she come to go to you for little items of cash?

A. Dan was down at the shop, and she fell in need of money and asked me whether I could not give it to her; that Dan was down at the shop all the time spending his time in these inventions and she must have some money, she said, to keep the family going.

Q. 75. When you purchased the property in 1876, what price did you agree to pay for it?

A. Twenty-two hundred dollars.

Q. 76. Was he to give you an unincumbered title?

A. Clear of all incumbrance was what the agreement asked for.

Q. 77. When you and your lawyer came to examine the title, what did you find to be the condition of it as to incumbrances?

A. Insolvent.

Q. 78. Explain what you mean by its being insolvent.

A. In the first place, I got Mr. Sadler, from Carlisle, to see after the docket and investigate how it was regarding judgments on that property of Daniel Drawbaugh's, and he did, and then wrote to me that I should be careful not to pay any money out; that it was insolvent. Then after that he gave me a list of all the judgments against him—Drawbaugh.

Q. 79. Did you find that the judgments against the property, that were on record, amounted to about as much as the property was worth or not?

A. I found at that time just as much.

Q. 80. I suppose you told Drawbaugh what you had found?

A. I told him of it; yes, sir.

Q. 81. What did Mr. Drawbaugh say and do about some of those judgments when you told him how the title stood on the books?

A. He said that that could not be so, and he went and searched and got them to release one of six hundred dollars, and another one, I can't tell you the amount. I paid him twelve hundred dollars out of twenty-two, and the balance I retain yet.

Q. 82. Do you know what he did with the twelve hundred dollars that you paid him?

A. He bought a property in Mechanicsburg the time that he sold this to me.

Q. 83. What kind of a property in Mechanicsburg—a dwelling-house?

A. Yes, sir.

Q. 84. Did he move his family into it?

A. Yes, sir.

Q. 85. Do you know whether or not he bargained for the property in Mechanicsburg before you paid him the twelve hundred dollars?

A. He bargained in the fall, and I paid him in the following spring.

Q. 86. Did you pay him in the spring of 1876?

A. That spring that I moved in, I paid him.

Q. 87. Do you know how much of the twelve hundred dollars Mr. Drawbaugh paid on the Mechanicsburg property?

A. Yes, sir; one thousand dollars, and the balance by yearly payments—I think three hundred dollars.

Q. 88. You mean you think he was to pay the balance by yearly installments?

A. He was to pay the balance by yearly installments—I think three hundred dollars; that is what I heard.

Q. 89. You have testified that when Drawbaugh showed you the talking-machines, in the summer of 1875, and said he wanted somebody to go in with him and get a patent on it, you did not go in with him on it because you had not the ready money in your pocket. Would you have gone in with him on it if you had had the ready money in your pocket at that time?

A. Yes, sir.

Q. 90. When you paid him the twelve hundred dollars on the property, in the spring of 1876, you must have had some ready money in your pocket. Why did you not go in with him and get a patent at that time?

A. Because I bought the property of him, and knew that I had not enough to pay for that.

Q. 91. Did you have to borrow money to make out your payment of twelve hundred dollars?

A. Yes, sir.

Q. 92. How much?

A. Eight hundred dollars.

Q. 93. Where did you get the other four hundred between the summer of 1875 and the spring of 1876?

A. I collected in money from my customers that was standing out.

Q. 94. Why did not you invest your money in getting a patent instead of investing it in a house to live in, and a blacksmith-shop to work in?

[*Objected to as leading and argumentative.*]

A. Because I always tried to provide for my family before I would reach out too far at other things.

Q. 95. Did Mr. Drawbaugh have quite a family?

A. Yes, sir; more than I ever had together at once.

Q. 96. Did he have considerable sickness in his family at different times, and some deaths?

A. Yes, sir.

Cross-examined by Mr. Storrow:

Cross-Q. 97. Was it Drawbaugh's habit to provide for his family before reaching out at inventions and patents?

[*Objected to as incompetent, argumentative, and indefinite.*]

A. I think he oftentimes neglected it.

Cross-Q. 98. What were the terms of sale of Drawbaugh's place to you?

A. Cash, on April 1, 1876.

Cross-Q. 99. Do you mean that was the agreement you made in August, 1875?

A. Yes, sir; the agreement was this; that he was to give me a title clear of all incumbrances and I was to pay him cash on the first day of April, 1876.

Cross-Q. 100. If I understand you, Drawbaugh owned a house with two tenements, and he lived in one of them and you lived in the other 'till you bought the whole. Is that the way it is?

A. Yes, sir.

Cross-Q. 101. When you and Drawbaugh talked about your going in with him to take a patent, did he tell you how much money he would need, or how much you would have to pay?

A. No; he did not say how much it would take, and I did not ask him.

Cross-Q. 102. You have testified that business took you to Drawbaugh's shop. What was the business that took you there at any time?

A. The business that took me there was, when he wanted to show me the particular way of bending or shaping iron for levers, &c.--different things, combining the whole thing, that he knew that he could not give me to understand plainly by draft.

Cross-Q. 103. I notice in the account which the examiner has to copy off—I mean the account with Drawbaugh in your books—a number of items marked "nail-cutter." What were those for?

A. That was a separate company; Geary, Lee & Co.—Governor Geary.

Cross-Q. 104. What became of those nail-cutters?

A. They fell through and died.

Cross-Q. 105. Who invented them?

A. Drawbaugh.

Cross-Q. 106. How large a settlement is Eberly's Mills—how many houses?

A. Fourteen or fifteen besides the mill.

Cross-Q. 107. Was Mr. M. M. Grove a member of the axle company that you have testified about?

A. There was a Grove in, I learned afterwards, but whether his name was M. M. or not, I do not know.

Cross-Q. 108. Drawbaugh made some special tools or machines to make the axles by, did not he?

A. Yes, sir.

Cross-Q. 109. You testified this morning that the first time you saw instrument "H,"—which is the large sloping one with the bell on top—was after the time when you first saw and heard any talking-machines. How long was it after you first saw and heard any of them, that you first saw "H"?

A. That I can't tell you—how long it was.

Cross-Q. 110. Was it pretty soon or was it a number of years? What is your best recollection about it?

A. To the best of my knowledge, it was within a year from the time when I talked with him through the machine.

Cross-Q. 111. I wish you would read your 74th question and answer and tell me what are the "inventions" that Mrs. Drawbaugh had referred to.

A. That I can't tell you. I was not there to see what she had reference to.

Cross-Q. 112. Did she have reference to any particular invention, or to the idea that Drawbaugh was always at work on some idea or other?

[*Objected to, except so far as Mrs. Drawbaugh stated what invention she referred to, her statements only being evidence.*]

A. She said that he was always sticking down in that shop inventing, and never provides for his family. That is the remark that she made.

Cross-Q. 113. Did she say that to you once?

A. Often.

Cross-Q. 114. Do you mean often during all the years covered by the accounts?

A. Yes, I may say every year a couple of times, she came to the shop complaining.

Cross-Q. 115. In what years was it that you used to see him at work nights on the talking-machine?

A. I can't tell you what years.

Cross-Q. 116. Was it during more than one year?

A. Yes, me and him talked frequently on that subject.

Cross-Q. 117. Was it during more than one year that you used to see him working at the shop at night on the talking-machine?

A. I saw him frequently at that. Then I saw him again that he did not work at it, and told me that when he was by himself at night, that he has a better chance to study about these things, and that he very seldom goes to sleep before midnight; then sleeps in the morning to make up for the fore part of the night. I then told him that that would not suit me, and I would like to sleep in the fore part of the night and get up in the morning. He said it was not so with him, that he does his studying before midnight, and then sleeps the after part.

Cross-Q. 118. You say he told you that he had a better chance to study about these things at night. By "these things," do you mean talking-machines alone, or his inventions generally?

A. It was nothing said in general or talking-machines; he just said inventions. There was no reference exactly to either one.

Cross-Q. 119. A number of instruments have been shown you while you were testifying to-day; when did you last see any of them before this week?

A. I have not been down at the shop for about two months. I have been too busy to get there.

Cross-Q. 120. Have you ever made an affidavit about any of them?

A. Yes, sir.

Cross-Q. 121. When?

A. That I can't tell you—the day.

Cross-Q. 122. State as nearly as you can.

A. It was the after part of last summer, or last fall; I can't tell positively; I did not keep no date.

Cross-Q. 123. You did considerable work for the Drawbaugh Pump

Company, did not you? It was something every few days, was not it?

A. I have done no work for the Pump Company since December 17th, 1870, because at that time, I think, she busted up.

Cross-Q. 124. You did considerable work for them before that, did not you?

A. Oh, yes.

Cross-Q. 125. When did you do the first work for them?

A. 1868, March 31st.

Cross-Q. 126. That is the very first entry in your book, is not it?

A. The very first. That spring I rented the shop from Drawbaugh.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 19th day of May, 1881.

FRED. M. OTT,
Examiner.

DANIEL FETTROW.

Adjourned until ten, A. M., May 20th.

May 20th, 1881.

Examination resumed, pursuant to adjournment.

Present, Mr. Storrow for complainants, and Mr. Hill, Mr. Abraham, and Mr. Jacobs for respondents.

EPHRAIM R. HOLSINGER *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. Age, thirty-eight years; residence, Saxton, Bedford county, Penna.; I am now a newspaper man, and run a job printing-office.

Q. 2. Did you at one time live at Eberly's Mills, Cumberland county, Penna.?

A. Yes, sir.

Q. 3. Where did you move from when you moved to Eberly's Mills?

A. Harrisburg.

Q. 4. When did you move from Harrisburg to Eberly's Mills?

A. On the 7th day of September, 1873.

Q. 5. When you moved away from Eberly's Mills, where did you move to?

A. Martinsburg, Blair county, Penn.

Q. 6. When did you move from Eberly's Mills to Martinsburg?

A. On the 27th day of November, 1876.

Q. 7. Then you resided continuously at Eberly's Mills from September 7, 1873. to November 27, 1876, did you?

A. Yes, sir.

Q. 8. Did you keep house there?

A. Yes, sir; I did.

Q. 9. State whether you have ever been at Eberly's Mills since you moved away from there in November, 1876.

A. I have not.

Q. 9. While you lived at Eberly's Mills, did you know Daniel Drawbaugh of that place?

A. I did.

Q. 10. How far did you live from his dwelling-house there?

A. Probably fifty steps.

Q. 11. Since you moved away from Eberly's Mills, in November, 1876, how many times had you seen Daniel Drawbaugh before you came here yesterday to give your testimony?

A. Once only.

Q. 12. When was that, and how came you to see him then?

A. July 3, 1880. He came to my place in company with Mr. Jacobs.

Q. 13. While you lived at Eberly's Mills, were you, or were you not, frequently in Mr. Drawbaugh's shop there?

A. I was there frequently.

Q. 14. Do you remember of the Haucks carrying on the faucet business while you lived at Eberly's Mills?

A. I do.

Q. 15. Do you recollect whether they began to carry on that business about the time you moved there, or not?

A. Somewhere shortly after I came there I noticed them there; whether they were operating when I moved there, I do not recollect.

Q. 16 Do you recollect of the axle business being carried on there by Wilson Bear and others, while you were there?

A. I do.

Q. 17. Do you recollect whether Captain Moore had wound up that axle business before you left there?

A. I do.

Q. 18. About how long before you left, to the best of your recollection?

A. My impression is, about the latter part of August, 1876.

Q. 19. When you were in Mr. Drawbaugh's shop, during your residence at Eberly's Mills, did you ever see any talking-machines there? If so, how often?

A. I have saw them very frequently; upwards of fifty times at least.

Q. 20. Do you remember the fact of Daniel Drawbaugh moving his family to Mechanicsburg, while you lived there at Eberly's Mills?

A. I do.

Q. 21. Did you see the talking-machines more frequently before he moved to Mechanicsburg, or afterwards?

A. Most frequently while he lived at Eberly's Mills. I also saw them after he moved away.

Q. 22. Please look at the machines now shown you, marked "B," "F," "I," "A," "D," "E," and state whether you saw them, or any of them, while you lived at Eberly's Mills.

A. These are all plain to me, that I saw all of them; helped Dan to experiment on them.

Q. 23. What were the first ones that you saw there?

A. The tumbler without a bottom and a wooden bowl on top, and the tin can, [the witness points to machines "F" and "B."] Next that I saw there was this one, [taking up "A."] I saw him make this one. These two [taking up "D" and "E"] came next.

Q. 24. State whether or not you saw this box, marked "I," there at one time, and inquired what it was.

A. I have. I asked Dan what it was for; he made no reply. I took it for granted that he did not wish to tell me what it was for.

Q. 25. Was that before or after you had seen the machines "B" and "F," and knew what they were for?

A. Before.

Q. 26. Did you and Mr. Drawbaugh ever operate the machines "B" and "F?"

A. We did.

Q. 27. What did you do with them?

A. We connected them with wires through partitions and floors, spoke into the one, listened at the other. We had them through the partition, and again through two floors into the basement.

Q. 28. When you listened at the one, and Mr. Drawbaugh talked into the other, did you hear and understand distinctly what he said through the machines?

A. Yes, sir; very distinctly. Could tell talking and music apart.

Q. 29. Could you hear and understand the words that were spoken when he talked into the machine?

A. Yes, sir; we would use such words which have similar sounds, knowing them to be more hard to understand than those having more contrast in sound.

Q. 30. After you saw Mr. Drawbaugh making the machine "A," did you take part with him in experimenting with that machine, and listening to see how the words came through it?

A. I did.

Q. 31. How well did that operate?

A. Somewhat better than the first experiment in which I had acted a part.

Q. 32. Did you see him make the machines "D" and "E?"

A. I did.

Q. 33. Did you talk with him through those two machines while you lived there?

A. Yes, sir.

Q. 34. To the best of your recollection, about what time was it when you and Mr. Drawbaugh first experimented with those two machines, "D" and "E?"

A. About the middle of the summer of 1875.

Q. 35. Did you and he, after you first saw those two machines "D" and "E," experiment with them a good deal, or not much?

A. Very frequently.

Q. 36. Did you hear and understand distinctly what was said through those machines?

A. We did; we could speak through this one [holding up "D"] and hear what the other one said with it also; and the same with "E."

Q. 37. Please look at the machines "L" and "M," now shown you, and state whether you saw them, or either of them, during the time when you lived at Eberly's Mills.

A. I saw the magnets; this double-crooked magnet inside, having reference to the bent steel in both—I saw them both. But as to the boxes, the wooden boxes in which the magnets now are, I don't know.

Q. 38. What is your recollection as to the time when you saw the instruments "L" and "M"?

A. A short time before I moved away.

Q. 39. Please look at the instruments "G" and "O," now shown you, and state whether you have any recollection of them.

A. Very little recollection. It seems to me rather doubtful whether I ever saw them.

Q. 40. You have stated that the first time you saw this box "I," Mr. Drawbaugh did not reply to your question as to what it was for. Did you afterwards see it again during your experiments with Mr. Drawbaugh with the talking-machines?

A. Yes, sir.

Q. 41. Did you then find out what it was? If so, what?

A. He placed a magnet in it of some kind, with something else, by which it was calculated to either give sound, or receive, as an experiment. Again he formed it into either an instrument to speak into, or hear from. That is about all I know. We had a wire passing through it, one end of which wire was connected to a small magnet attached to a clock, near the pendulum wire. The other end was attached to a magnet on a bench on the opposite side of the building; the object being to hear the tick of the clock, as the sound would pass over the wire, through this machine "I."

Q 42. Do you recollect whether, at any time, you and Mr. Drawbaugh talked through these machines "L" and "M," or through machines containing magnets similar to those?

A. We never talked through them, to my recollection.

Q. 43. Were you ever in Mr. Drawbaugh's shop at night experimenting on talking-machines with him?

A. Yes, sir; often.

Q. 44. How often?

A. I could not just say how often, but twice I recollect of being there 'till one o'clock. Many times besides, as late as ten and eleven. Sometimes got a good scolding when I got home.

Q. 45. From all you saw of Mr. Drawbaugh's operations and employment during the time that you lived at Eberly's Mills, what was he experimenting on principally?

A. The talking-machine. He appeared to be crazy on it. I often tried to get information from him on other subjects, and about a half a minute's talk would turn him right on the talking-machine. That is about his standing—the way he felt all the time I was there.

Q. 46. State whether he said anything to you, at any time while you lived there, about liking to talk with you on the subject of the talking-machine, and why.

A. He did. Shortly after I came there, I made mention of a certain machine which was considered, by people who think themselves sharp, an impossibility. He said to me that my mind run very much in the same direction that his did, and that I was the only person he came across to whom he felt free to express some of his private ideas.

Q. 47. Did Mr. Drawbaugh, at any time while you lived there, state to you how far he could transmit spoken speech by means of his talking-machines? If so, what did he say?

A. He did; he said as far as wire could be magnetized.

Q. 48. What did he mean by that, as you understood him at the time?

A. That there was no limit to the distance to which it could be done; that you could send it as far as you could put wires.

Q. 49. I suppose that, while you lived at Eberly's Mills, you were acquainted with Mrs. Drawbaugh, the wife of Mr. Daniel Drawbaugh, were you not?

A. I was.

Q. 50. Did she visit your family occasionally or frequently?

A. Our association was frequent from this cause: the spring from which the entire town of Eberly's Mills took their water for house use was against the wall of the house in which we lived; therefore, Mrs. Drawbaugh, in bringing water, would very frequently stop at our door and chat a little.

Q. 51. Did you ever hear her say anything, on any of those occasions, or at any time or times while you lived at Eberly's Mills, about her husband's experiments down at his shop, and if so, what?

A. I did. I heard her say that Dan was at that ——— old shop fooling his time away, while they, the family, hardly knew how to get anything to eat. She also told me, in my office, that she smashed up a lot of photographing and other things about the house, in order to stop Dan from fooling with them.

Q. 52. How often did you hear her make remarks of that character, condemning his persistence in his experimental work at the shop?

A. Just how often, I could not say; perhaps a dozen of times or more. It was pretty often.

Q. 53. In any of your experiments with Mr. Drawbaugh at his shop, did one of you whisper through the machines, or make other noises than talking and singing, to see how they would convey such sounds?

A. We did. We whispered, we scratched on pieces of wood with pieces of old file, we rubbed paper together between our fingers, and then would ask one another whether one could tell what the other one done, or how the noise was made. We asked this through the machines and otherwise. We would hold the paper, or whatever we used, by which the noise was made, to the mouth-piece of the machine.

Q. 54. And could you distinguish through the machine how any of those various noises were made?

A. Most generally.

Q. 55. During those various experiments, about which you have testified to-day, did Mr. Drawbaugh ever explain to you what kind of an electric circuit he used in connection with these talking-machines, so far as you remember?

A. I remember very distinctly of its explanation, but what it consisted of I do not remember, from this fact: that I saw that his machine would be a success, and therefore did not tax my memory with any minuteness with regard to his description or explanation.

Q. 56. Do you recollect anything about his using carbon, either alone or mixed with anything else, in any of his experiments in connection with the talking-machines at that time? If so, what is your recollection?

A. I have a recollection of him forming a small, round, thin plate, or article, which he formed, I think, of powdered limestone and carbon, and perhaps a third substance or ingredient. This he brought to a certain consistency by the aid of heat, after which he placed it inside of a round, hollow, low, wooden vessel, over which he fitted another wooden, flat top; that I do not see here.

Q. 57. Did you understand at the time that it was to be used in connection with the talking-machines?

A. I did. The mouth-piece was one similar to the one on the old glass tumbler ["F"]—was placed over the top of it, after the little carbon machine had been put into a tumbler.

Q. 58. Do you recollect of hearing him say anything about high

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conductors and low conductors, in connection with his talking-machines?

A. I did; but just what he said I do not recollect, more than that he explained the different ways of using the conductors.

Q. 59. When you were experimenting with the instruments "F" and "B," do you recollect whether the end of the tin tube of "B" next to the electro-magnet was closed with anything, or not?

[*Objected to as leading.*]

A. It was closed with a vibrating substance, inside of which was a little sheet of soft iron.

Q. 60. Did Mr. Drawbaugh explain to you at the time how the current of electricity caused the instrument "B" to make or repeat the sounds which you heard in it? If so, what idea did you get of it from his explanation?

A. He explained it to me at different times, but I do not recollect now what he said.

Q. 61. About how long ago do you remember reading in the newspapers, for the first time, an account of a talking-machine by which one man could talk to another to a long distance by means of electricity?

A. About thirteen months ago my attention was drawn to an article by a man looking over my exchanges, in which mention was made, being the Philadelphia daily *Record*, of some one having a machine called the electro-telephone, or something of that kind. I think those were the words used. I replied to the one reading the article that that machine is Dan Drawbaugh's, or one just like it.

[*Answer objected to by Mr. Storrow unless the alleged article is produced or identified.*]

Q. 62. When Mr. Drawbaugh and Mr. Jacobs visited you last summer, as you have testified, what was the nature of the interview between you and them?

A. They had a few of these instruments before us with them, which they asked me whether I ever saw them. I told them I had saw them, or others just like them, and they asked me to give my affidavit to that effect, which I did. Very little conversation of any kind took place, they not being there in my presence over two hours.

Recess for dinner until 2.15, P. M.

May 20, 1881, 2.15, P. M.

Examination resumed.

Present, same counsel.

Q. 63. During the progress of the experiments which you and Mr. Drawbaugh made with talking-machines while you lived at Eberly's Mills, was anything said about patenting the invention? If so, what?

A. There was. I asked him whether he was getting a patent on it. He said he would as soon as he would be able; that is, as soon as he could get money to pay for it.

Q. 64. Do you recollect whether anything was said between you and him, at the time you lived at Eberly's Mills, about his making efforts to get others to go in with him to furnish the money in order to take out a patent on his talking-machine? If anything was said about it, what was it?

A. I remember of him several times telling me that if he could get parties who he could trust, he would give them a fair interest in it, but he said that those who had the money did not appear to see that the invention would amount to anything, and he still thought that he would add other improvements to it, which would be necessary to make it complete, and if he got a patent on it in the way it was, it would cost extra to add the improvements, and for that reason he did not make any extra efforts to get the money.

Q. 65. Was there a man by the name of Daniel W. Smith at one time at work for you, while you lived at Eberly's Mills?

A. There was.

Q. 66. What was he doing for you?

A. He was helping me in the printing office.

Q. 67. What time did you commence printing at Eberly's Mills?

A. About the first of May, 1874.

Q. 68. When did Smith work for you?

A. He commenced about the middle of November, 1874.

Q. 69. How long did he work for you?

A. About two months.

Cross-examined by Mr. Storrow:

Cross-Q. 70. What was your business in Harrisburg before you moved to Eberly's Mills?

A. I worked in the State printing office for Mr. Singerly.

Cross-Q. 71. Whereabouts in Harrisburg did you live?

A. Near the corner of Third and Chestnut streets.

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Cross-Q. 72. What occupation did you have at Eberly's Mills, besides helping Drawbaugh with his talking-machines?

A. I had a job printing office in which I done job printing.

Cross-Q. 73. Did you own a house there, or whose house did you live in?

A. I rented a house from George Leonard.

Cross-Q. 74. Who took the house when you left?

A. That I do not know, I have not been there since.

Cross-Q. 75. What did your household consist of?

A. My family only.

Cross-Q. 76. Do you mean your wife and children only?

A. Yes, sir.

Cross-Q. 77. Did you have any relatives at Eberly's Mills?

A. No, sir.

Cross-Q. 78. Why did not you keep Smith with you more than two months?

A. He became dissatisfied with his position and quit.

Cross-Q. 79. You were well enough pleased to have him quit, were not you?

A. I was satisfied.

Cross-Q. 80. You found he was lazy and shiftless and not good for much, did you not?

A. I never said so; a silent question.

Cross-Q. 81. You thought so, did not you?

[*Objected to as incompetent, irrelevant, and immaterial.*]

A. I never expressed myself. I always thought it best to keep quiet on subjects of that character.

Cross-Q. 82. Do you prefer not to answer the last question any further?

[*Objection repeated.*]

A. I do.

Cross-Q. 83. His wife left him on account of his conduct, did not she?

[*Same objection.*]

A. I do not know whether she left him for that, or not.

Cross-Q. 84. You understood that that was the reason, and heard so, did not you?

[*Same objection.*]

A. I never heard—never bothered myself anything about other people's business.

Cross-Q. 85. That was the common report, was not it?

[*Same objection.*]

A. I know nothing about those reports.

Cross-Q. 86. I don't ask you whether the report was true. I ask you whether you did not hear that report about him, or whether that was not the report about him?

[*Same objection.*]

A. There may have been such a report, but, to my recollection, I do not know anything about it; to unpleasant things I always turn a deaf ear.

Cross-Q. 87. Where did you move to when you left Eberly's Mills?

A. Martinsburg, Blair county, Penna.

Cross-Q. 88. What was your occupation there?

A. Printing.

Cross-Q. 89. Did you have a shop of your own, or work as a journeyman?

A. I rented a house and used my own material.

Cross-Q. 90. How long did you stay there, and where did you go to next?

A. I remained in Martinsburg two years. I next went to Cove Station, and followed up job printing there for about six months, when I moved to Saxton, at which place I now reside, in the same business.

Cross-Q. 91. Have you never seen any of the Eberly Mills people since you moved away from there?

A. No one except Dan Drawbaugh, and him once only—talked with him, perhaps one half hour, on the third day of July, 1880.

Cross-Q. 92. Any letters ever pass between you and any of the Eberly Mills people since you left?

A. Very few; two, I think, only.

Cross-Q. 93. Who were those from?

A. One was from a little girl who used to be at our house frequently, while we lived at Eberly's Mills; and the other one was from William Dellinger, both being sociable family correspondence.

Cross-Q. 94. Did you ever hear anything about Drawbaugh, or about his talking-machines, between the time you moved away from Eberly's Mills and the time he came to see you last summer?

A. I did not.

Cross-Q. 95. Who was it called your attention to the article which you say was in the Philadelphia *Record* thirteen months ago?

A. David B. Weaver.

Cross-Q. 96. Is he a Saxton man, or a man from this part of the country?

A. He lives in the neighborhood of Saxton; a man taking great interest in new inventions; reads many scientific papers, and therefore notices almost everything new that comes out.

Cross-Q. 97. How do you fix the time as thirteen months ago, which would bring it in April, 1880?

A. Will you please notice that I said the man who noticed it was looking through my exchanges? Whether it was a paper of 1880, or an older one, I do not recollect—did not look at the date of it. The time at which Mr. Weaver was in my office was when he was plowing his ground for corn, and it being the first spring in which he came to my office, that fixes the time.

Cross-Q. 98. Was April, 1880, the first time that you ever heaad of the existence of the electric speaking-telephone, other than those which you say you saw at Mr. Drawbaugh's shop?

A. For that I would not like to say, for the fact that Drawbaugh had this machine, and me knowing it, mention might have been made of one, without attracting my attention, having plenty to do to keep myself a moving. I could not read or think as much as I would have liked to do.

Cross-Q. 99. Who was present at any of these times when you and Drawbaugh were experimenting with talking-machines, while you lived at Eberly's Mills?

A. I do not remember of any particular person.

Cross-Q. 100. While you were at Eberly's Mills, did not Drawbaugh say something to you, that he had heard somebody else had made a speaking-machine, or telephone?

A. Not to my recollection. If he had, I would undoubtedly have remembered it.

Cross-Q. 101. Did not he tell you that somebody else had got a patent for one?

A. He did not. I did not know that it was patented until within a few days ago—did not bother myself any about it. I did not ask Drawbaugh or Mr. Jacobs, last summer when they were with me, whether it was patented or not.

Cross-Q. 102. Did not they tell you what they wanted your affidavit for?

A. They told me that other parties were contending for the same invention and they thought that Dan's invention was made before the other parties, and they were trying to prove priority of invention.

Cross-Q. 103. Did they tell you that other parties were trying to get a patent on the machine?

A. I think not.

Cross-Q. 104. Did they tell you that other parties had got a patent on it?

A. No, sir; I would not have said I did not know that there was a patent on it.

Cross-Q. 105. Did Drawbaugh have any talk with you last summer about his chances for getting a patent on the machine?

[*Objected to as incompetent, irrelevant, and immaterial.*]

A. I asked Dan Drawbaugh about it. He said, "I do not know what the chances are;" that is all I know about that.

Cross-Q. 106. You told him you were glad that at last he had found somebody to take it up and furnish the money, did not you?

[*Same objection.*]

A. I did. I always feel glad when I see my friends get along—do yet, though that has nothing to do with his getting along.

Cross-Q. 107. You asked him how the people who were interested with him came to take it up, and agreed to furnish the money, did not you?

[*Same objection.*]

A. I think not. I don't know anything about it; at least I could not now state why it is so, nor how it is, at this moment. I do not know.

Cross-Q. 108. While you lived at Eberly's Mills, was not Drawbaugh capable of earning all he needed, if he would only work steadily?

A. Yes, sir. He did work steadily, intently—never lost one moment, but, influenced by some supernatural or other power, did not happen to work at such things as did, or would, bring him the required necessaries for the sustenance of himself and family.

Cross-Q. 109. What things did he work at?

A. He put a great deal of his time in experimenting on his talking-machine. In fact, so near all his time that he got very little earned.

Cross-Q. 110. What other inventions was he working on during the three years and a quarter that you lived at Eberly's Mills?

A. I do not remember of anything that he was working on, except a magneto-electric machine, but whether he worked on that as an invention while I was there, or only completing a former invention, I do not know. That is about the substance of what I know about his inventions.

Cross-Q. 111. You have described the wires which you say you and he talked over with these machines. Did you help him to put them up, or did you see him put them up?

A. I did not describe any wire. I did not help him put them up. He generally got things ready, then told me to come and help him.

Cross-Q. 112. Who run the grist-mill while you were there?

A. George Leonard was proprietor and employed different men. I could not say who they all were. This was when I went there. About the first of January, 1876, William Dellinger and a Mr. May,—I don't know his name,—on some conditions, bought the mill, and were running it when I left.

Cross-Q. 113. Did Mr. George Leonard own other property there, besides the mill and the house you lived in?

A. Yes, sir; he owned the house he lived in, and several other houses, and a few acres of ground—just how much, I do not know.

Cross-Q. 114. Who kept the store during the three years you lived there?

A. In full there was no store kept during the three years while I was there. Abner G. Wilson had store there for a while, but, having a keg of powder too near the fire, blowed him up, or the goods. Some lit, and some did not; some burned up before they lit. It so completely busted the shell of the house in which it was, that he left and never returned. After which, perhaps a year, a new shell was prepared to keep store, in which Jeremiah Fry kept some few articles. That is all I recollect of the store business at Eberly's Mills.

Cross-Q. 115. Who worked in the store when Fry kept it?

A. Mr. Fry and his family.

Cross-Q. 116. Who was with Wilson in keeping the store?

A. A circumstance, which I will not relate, caused a dissolution of partnership between Johnst. Leonard and A. G. Wilson, after which Wilson attended to it himself.

Cross-Q. 117. Who kept the Post Office, and where was it kept?

A. When I first went there, George Kissinger lived in the store house. I think that was his name,—and he kept it; next, Wilson kept it in the store; then Fry took it—had it when I left.

Cross-Q. 118. What railroad station did the Eberly Mills people use, and was there a mail-cart or any regular conveyance to it?

A. They used White Hill station on the Cumberland Valley road. They got their mail there every day—carried it by foot power. Kissinger carried it until he left—about the first of May, 1874. After that, witness was honored with the mail messengership. for the following two years. When I left, a young Mr. Fry carried it.

Cross-Q. 119. Was there a carpenter lived at Eberly's Mills? If so, who was he?

A. There was none there, that I know of.

Cross-Q. 120. Please tell me the rest of the householders who lived there while you did.

A. I am unable to do so. I could not tell. I could mention a few. There was continual moving there and away.

Cross-Q. 121. Name those whom you do recollect.

A. J. B. Drawbaugh, George Drawbaugh, Daniel Fettrow, Daniel Drawbaugh, ——— Frownfelter,—his first name I do not know,—Michael Kohn, John Rennard, Harry Lewis, Jacob Zimmerman, Daniel Wesley Smith, William Dellinger, George Leonard, Jacob Evans, John Smith, Sr., ——— Bowman. That is all I can recall now. There were others there, but I can't recollect their names.

Cross-Q. 122. Who kept the school that the children went to?

A. I am unable to call the names to my memory.

Cross-Q. 123. Who was the shoemaker while you were there?

A. No regular shoemaker there; a good many cobbled around a little sometimes.

Cross-Q. 124. Who kept the cobbler shop?

A. They had no shops. They done it in their kitchens. I suppose that is the cobbling.

Cross-Q. 125. Please look at the machines now shown you, marked "C," "H," and "J," and tell me whether you ever saw any of them before to-day.

A. I have some faint recollection of seeing this one ["C."] The others I know nothing about.

Cross-Q. 126. Please look at these now shown you, "K" and "N," and tell me whether you ever saw them before.

A. I never saw them.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 20th day of May, 1881.
FRED. M. OTT,
Examiner.

E. R. HOLSINGER.

Saturday, May 21, 1881, 10, A. M.

Examination resumed pursuant to adjournment.

Present, Mr. Storrow for complainants, and Mr. Hill, Mr. Abraham, and Mr. Jacobs for respondents.

ROBERT J. STRONG, *being produced, affirmed, and examined, saith:*

Examined by Mr. Abraham:

Q. 1. State your age, residence, and occupation.

A. I am twenty-seven years of age; reside at Shiremanstown, Cumberland county, this State; farming is my occupation.

Q. 2. What was your occupation in the years 1875 and 1876?

A. Teaching.

Q. 3. At what school were you teaching in those years?

A. The Cedar Spring school.

Q. 4. Besides the name of Cedar Spring, had that school any numerical denomination, or was it known by any other name, other than Cedar Spring?

A. It was—as Gorgas' school; it was also known as No. 2.

Q. 5. When did you commence and when did you discontinue teaching at that school?

A. I commenced September 13th, 1875. I discontinued in March, 1876.

Q. 6. While you were teaching at that school, did you ever pay a visit to Daniel Drawbaugh's, at the shop where he was working, at Eberly's Mills?

A. I did.

Q. 7. State when, and the object of that visit.

A. In November of 1875, to have a gun repaired.

Q. 8. While you were there, did you see any instruments called talking-machines?

A. I did.

Q. 9. Who showed them to you?

A. Mr. Drawbaugh.

Q. 10. Did he tell you whose invention they were?

A. I can't remember whether anything was mentioned in that respect.

Q. 11. What parts of the instruments, or their connections, do you recollect having seen?

A. Wires, or a wire and an armature magnet.

Q. 12. To what part of the premises were these wires attached?

A. To the wall or partition at the shop.

Q. 13. And from the wall or partition, whence were they led?

A. I do not know.

Q. 14. Did Mr. Drawbaugh explain to you the principle on which his talking-machine operated?

A. He did not.

Q. 15. Why were you specially attracted to the wires and the armature magnet?

A. Mr. Drawbaugh's mentioning it, and being studying in that part of philosophy that bore upon that subject.

Q. 16. Do you mean that you were at that time studying philosophy bearing upon that subject, and that that was the reason you were specially attracted to the wires and the armature magnets?

A. Yes, sir; I was studying the subject of magnetism.

Q. 17. Did you leave your gun with Mr. Drawbaugh that day?

A. I did.

Q. 18. When did you go for it again?

A. Several days after.

Q. 19. Have you ever been to the shop since?

A. No, sir.

Q. 20. Are you acquainted with Mr. D. A. Hamacher?

A. Yes, sir.

Q. 21. Do you recollect a visit that he made to your school while you were teaching in 1876, in company with some young men?

A. I do.

Q. 22. Do you recollect the month or the day?

A. I do the month; it was February.

Q. 23. Do you recollect how many persons were with him, or the names of any of them? If so, state them.

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A. I do not, how many, but those of John F. Rupp and Forrest Shank.

Q. 24. Did Mr. Hamacher say where he was going after he left you?

A. Yes, sir; he said he was going to Drawbaugh's machine-shop.

Q. 25. Did he call on you with his companions after his return from Mr. Drawbaugh's?

A. He did, in company with Mr. John F. Rupp.

Q. 26. Did he tell you what he had seen there?

A. Yes, sir; he said he had seen a talking-machine.

Q. 27. Did you say anything to him about your having seen such a machine there?

A. I said, Mr. Drawbaugh said that he had such a machine.

Q. 28. Whom did you tell Mr. Hamacher that Mr. Drawbaugh had said that to?

A. I said he told me it.

Q. 29. I will show you now a book called Teachers' Monthly Reports for School No. 2 in Lower Allen District, Cumberland county, Pennsylvania, and I will ask you to examine the report for the lunar month ending February 14th, 1876. State whether the certificate dated February 14th, 1876, is signed by you, and tell me in whose handwriting all the blanks are filled up that precede that certificate.

A. Yes, sir.

Q. 30. There is a receipt at the foot of the right-hand page, dated the 25th day of March, for forty dollars. Is that receipt signed by you?

A. Yes, sir.

Q. 31. I notice on the 31st day of January, in the days of the month, under the head of "Attendance," Monday stated to be the 31st of January. Monday is also stated to be the 1st of February. Will you please state how the error occurred?

A. It occurred by transferring it from a memorandum sheet to the report, by writing the wrong day of the week.

[*By consent, a certified copy of said report is put in evidence, to stand in place of, and have the same effect as, the record in the book. Said copy is marked "Hamacher's Exhibit."*]

Cross-examined by Mr. Storrow:

Cross-Q. 32. Then I understand that you kept your records on sheets of paper, and that this book is only a copy of them. Am I correct in that?

A. Yes, sir.

Cross-Q. 33. Can you tell me what day of the week the first of February, 1876, was? Look at the book if that will help you any.

A. It would be Tuesday, by the book.

Cross-Q. 34. Now, will you look at the boy's side, and tell me how you succeeded in getting the 28th of January into the same week in which you say the first of February came on Tuesday?

A. I did not get it in, by my understanding of this report.

Cross-Q. 35. Look on the boy's side and tell me what day represents Tuesday, the first of February.

A. Here, marked Monday, January the 31st.

Cross-Q. 36. The day before that, on the boy's side of the report, is marked Monday, January the 28th; what did you do with the intervening days?

A. This is a mangled report. I can't answer for that work there.

Cross-Q 37. I see you have testified that your name is "Robert J. Strong." Did you have any particular reason for omitting the "J," when you signed these reports? I notice that they are all signed "Robert Strong," and that the pages are all headed "Robert Strong."

A. No, sir; more than that, I occasionally write it "Robert Strong."

Cross-Q 38. Did Mr. Drawbaugh's children go to that school to you?

A. Yes, sir.

Cross-Q. 39. I notice the name of Ida Zacharias among the scholars. Was she a daughter of Mr. John J. Zacharias?

A. To my knowledge, she is a daughter of John Zacharias.

Cross-Q. 40. I suppose you mean that you don't know whether he had a middle name, or not?

A. No, sir; I do not know whether he had a middle name or not.

Cross-Q. 41. He used to visit your school occasionally, did not he?

A. He did several times.

Cross-Q. 42. Mr. Scherich used to visit your school occasionally, did not he?

A. He did once to my knowledge.

Cross-Q. 43. The report for the month of February, 1877, in the same book, records the names of Miss Ida Zacharias as pupil, and J. A. Scherich and John J. Zacharias as visitors, does it not?

[*Objected to as referring to transactions that happened one year after the witness had left the school, and cross-examination upon a subject which was not examined in chief is irrelevant and improper.*]

A. Yes, sir.

Cross-Q. 44. The handwriting of the list of visitors in the report for the lunar month ending February 14th, 1876, appears to my eyes somewhat different from the handwriting of the list of names of scholars in that report, and in the preceding report; and therefore I ask you to look at them carefully, and to say whether all of those lists are in your handwriting?

A. Yes, sir; I recognize that as my handwriting at that time—both of the lists of names.

Cross-Q. 45. Mr. Hamacher's name in the report of February, 1876, seems to be written with a finer pen and in a more free and hasty manner than the list of pupils' names. Do you remember whether you did all the writing on the two pages of that report at the same time?

A. I do not, as I fill out my report at leisure time, still.

Cross-Q. 46. Do you mean by that that you take your leisure time, running over a number of days, as may be convenient, to write the report in the book?

A. No, sir.

Cross-Q. 47. Do you mean that you wrote the whole of the report in that book for that month on one day?

A. I do not know whether I did or not.

Cross-Q. 48. I suppose you did not begin to write the report in the book until after the close of the month, did you?

A. I don't suppose I did.

Cross-Q. 49. And therefore, the date of your certificate, February 14th, 1876, is not the date when the report was written out and signed, but merely the date of the close of the month. Is that so?

A. I cannot tell.

Cross-Q. 50. Who was present on this occasion in Drawbaugh's shop when you say you saw the talking-machine?

A. No one except Mr. Drawbaugh.

Cross-Q. 51. When you left off teaching that school, where did you reside?

A. With my parents at home, in Shiremanstown, Cumberland county.

Cross-Q. 52. Have you lived in Shiremanstown ever since?

A. Except when I was at school, and teaching school.

Cross-Q. 53. On the two occasions when you went to Drawbaugh's shop about your gun, what kind of business was being carried on there?

A. I do not know exactly.

Cross Q. 54. Did not you see any men at work on either of those two occasions?

A. None except Mr. Drawbaugh.

Re-direct by Mr. Abraham:

Q. Q. 55. I notice in the book of monthly reports, pasted within the cover, some printed explanations. Had you read them prior to making up your reports?

A. I did not immediately, to my knowledge, before making out the reports.

Q. Q. 56. Had you read them at all?

A. Yes, sir.

Q. Q. 57. I notice the first paragraphs read as follows: "In the new edition of the teacher's monthly reports few changes have been made except those in reference to obtaining the percentage of attendance. To these special attention is directed. As this book is intended to be in use and last five years, it will be necessary as well as proper to have the utmost care taken of it. The marks and writing in it should be carefully made with ink and not with a pencil, and erasures and blots should not be permitted. It will be found safest and best in practice to keep the mouth's record on a sheet of paper ruled for the purpose, and at the end, when the average and percentage have been estimated and entered, to copy it into the book. This course is recommended. A teacher's character is in no small degree indicated by the manner in which the monthly report is kept." Did you in fact keep the record of your school on separate sheet or sheets of paper, and at the end of the lunar month ending February 14th, 1876, make up your report from the separate memoranda kept by you in accordance with the printed instructions within the cover of the report book?

A. That was my custom then, and, to the best of my knowledge, I filled out my report from these memorandum sheets.

Q. Q. 58. Then the entry on your report for that lunar month, which shows Friday, 26th January; Friday, 27th January; Monday, 28th January; Monday, 31st January, are simply clerical errors made by you in transcribing from your original memoranda?

A. They are; yes, sir.

Q. Q. 59. Is it not a part of the duty of the teacher, in making out his reports, to write down the names of the school-directors and citizens who visit the schools during the current month?

A. It is, as I understand it.

Q. Q. 60. You have testified, in reply to cross-question number 43, in regard to a record of certain names in the report of February, 1877; did you ever see that report before to-day?

A. I did not.

Q. Q. 61. Then you know nothing about what transpired in the month ending February, 1877?

A. No, sir.

Re-cross by Mr. Storrow:

Re-cross-Q. 62. The paragraph read to you from the printed explanations says that a teacher's character is in no small degree indicated by the manner in which the monthly report is kept; don't you think it would be rather an unfair criticism always to judge a teacher's accuracy about dates by the reports entered in this book?

[*Question objected to as improper, asking the witness for his opinion as to the effect of a general rule of the school-board on his character and as to the justice or injustice of the rule of the school-board.*]

A. I think it would be rather unjust on the teacher's qualifications as a teacher.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 21st day of May, 1881.
FRED. M. OTT,
Examiner.

ROBERT J. STRONG.

Recess for dinner until 2. 30, P. M.

May 21, 1881.

Examination resumed, pursuant to adjournment.

Present, same counsel.

ADAM HILER, *being produced, affirmed, and examined, saith:*

Examined by Mr. Abraham:

Q. 1. State your age, residence, and occupation.

A. My age is thirty-nine; residence, Fairview township, Cumberland county, Penna; occupation, a farmer.

Q. 2. Did you ever live at Milltown, sometimes called Eberly's Mills?

A. Yes, sir.

Q. 3. State when, and for how long.

A. One year, 1869.

Q. 4. What were you employed at during that year?

A. I worked by the day, at labor.

Q. 5. Who did you work for?

A. I worked wherever I could get work.

Q. 6. Did you ever work for Daniel Drawbaugh?

A. I did; yes, sir.

Q. 7. What did you do for him—what kind of work?

A. Planted his potatoes.

Q. 8. How long were you engaged planting potatoes for him?

A. One day.

Q. 9. Do you know why he employed you to plant his potatoes, and did not do it himself?

A. No, sir.

Q. 10. Did you go into his shop while you were down there at that time?

A. I was there once.

Q. 11. Did he tell you anything then in reference to a talking machine that he was working on?

A. No, sir.

Q. 12. Did he tell you anything at any time in reference to a talking-machine?

A. Yes, sir.

Q. 13. When was that?

A. In 1869.

Q. 14. Where was it that he told you?

A. On the mill-bench, at the mill.

Q. 15. What did he tell you that he intended to accomplish by his machine?

A. He had calculated to invent a machine to talk.

Q. 16. Did he tell you anything about the distance that he could talk through his talking-machine?

A. Yes, sir.

Q. 17. What did he say about the distance?

HONE COMPANY,-1

A. He said he could stand here at White Hill and talk to his brother, the 'Squire, at Mechanicsburg, quite handily.

Q. 18. Do you recollect what you charged him for planting his potatoes?

A. No, sir; not exactly I don't.

Q. 19. Tell us, as near as you can, how much he owed you for planting the potatoes.

A. Of course I would not work for less than a dollar a day.

Q. 20. You were only engaged one day?

A. At that time.

Q. 21. Did you work for him again?

A. Yes, sir.

Q. 22. At what kind of employment?

A. Dug his garden.

Q. 23. How long were you employed at that?

A. Two days and a half.

Q. 24. Do you know what your charge was for that second employment?

A. I suppose it was a dollar a day; two and a half for that job.

Q. 24½. Did he pay you pretty promptly for planting his potatoes and digging his garden?

A. I had to wait till I got it.

Q. 25. How often did you ask him for it?

A. Not less than three times, anyhow.

Q. 25½. Why didn't he pay promptly?

A. Because he did not have it.

Cross-examination:

Cross-Q. 26. Where did you go to live after you left Eberly's Mills?

A. Well, I moved within a mile of Lisburn;—about three miles from the place I did live, in the same county.

Cross-Q. 27. Do you mean three miles from Eberly's Mills?

A. There's where I did live; yes.

Cross-Q. 28. How long did you live there and where did you go to next?

A. I moved from there to York county.

Cross-Q. 29. To what place in York county?

A. Shoffnerstown.

Cross-Q. 30. How far is that from Eberly's Mills?

A. I suppose about two miles and a half.

Cross-Q. 31. How long did you stay there, and where did you move to next?

A. I staid four years there and moved within a mile of Lewisberry, which was about five miles from Eberly's Mills.

Cross-Q. 32. How long did you live there and where did you go to next?

A. Four years, and then I moved back on the same road.

Cross-Q. 33. Where did you move to?

A. I moved to Epply's place. Epply owned the property.

Cross-Q. 34. How far from Eberly's Mills was that?

A. That was about three miles and a half.

Cross-Q. 35. How long did you live there, and where did you move to then?

A. I lived there one year, and moved to where I live now.

Cross-Q. 36. How long have you lived where you are now?

A. One year in April. This is the second year.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 21st day of May, 1881.
FRED. M. OTT,
Examiner.

his
ADAM X HILER.
mark

Adjourned until Monday, May 23, 1881, at 10 o'clock, A. M.

Monday, May 23, 1881, 10 *o'clock*, A. M.

Examination resumed, pursuant to adjournment.

Present, Mr. Storrow for complainants, and Mr. Hill, Mr. Abraham, and Mr. Jacobs for respondents.

HENRY BONHOLTZER, *being produced, affirmed, and examined, saith:*

Examined by Mr. Abraham:

Q. 1. State your age, residence, and occupation.

A. Fifty years old the 7th of May last; Steelton, Dauphin county blacksmith.

Q. 2. Are you acquainted with Mr. Daniel Drawbaugh, of Eberly's Mills?

A. Yes, sir.

Q. 3. Are you a joint inventor for a reaper knife with some other gentleman?

A. Yes, sir.

Q. 4. State the name of that gentleman and the time when said invention was patented.

A. Jacob Shopp; May the 18th, '69.

Q. 5, Did you make another invention in connection with Mr. Shopp and have it patented? If so, please state the date of this latter patent.

A. Yes, sir; 14th of September, in the same year.

Q. 6. Who helped you prepare the model for this later invention?

A. I prepared them mostly myself, and, also, Mr. Drawbaugh gave me some instruction.

Q. 7. Where were you when Mr. Drawbaugh gave you the instruction; and who, if anybody, was with you at the time?

A. Well, I was at his shop—at his place at Milltown, and Mr. Shopp was along with me.

Q. 8. State, as nearly as you can, the time when this interview occurred at Mr. Drawbaugh's shop.

A. It was in June—the early part of June—can't just mention the date. I was working then at Lancaster City, making some of those knives at the time; Mr. Diller's shop in Lancaster City.

Q. 9. You mean, then, that that was after you got out your first patent, and before you got out your second one; am I right?

A. Yes, sir; after we got out our first patent and before we got out our second one.

Q. 10. Did you go there more than once to consult Mr. Drawbaugh in reference to your second invention?

A. Yes, sir.

Q. 11. About how many times?

A. From June to September, I sent Mr. Shopp there, and was there myself during that time half a dozen times. I sent Mr. Shopp there twice a week.

Q. 12. How many times did you go there with Mr. Shopp?

A. Well, I can't just state how many times I went with him. Every time I went, he was along with me, and every time he went, I was along with him, so we both went together.

Q. 13. At any one of these visits, do you recollect Mr. Drawbaugh speaking to either of you about a talking-machine?

A. He was speaking to Mr. Shopp—showing the machine to Mr. Shopp—and, at the same time, I paid small attention to it, but took notice that he was showing the machine to Mr. Shopp.

Q. 14. What did Mr. Drawbaugh say about his talking-machines to either of you?

A. He showed him a machine that he was going to invent for speaking through. He spoke something that he was inventing something to speak through wire—a box or telegraph wire at that time, or something or other at that time. Then, he didn't care about showing it to every one. He showed it to Mr. Shopp; didn't pay much attention to it myself because he was showing it to Mr. Shopp. I was more interested about my own machine. That was all that was spoke to me there at that time.

Q. 15. Did he say he didn't show it to everybody?

A. Yes, sir; he said he didn't show it to everybody, but he showed it to Mr. Shopp.

Q. 16. You were then more interested in your reaper bar more than you were in Mr. Drawbaugh's invention, were you not?

A. Yes, sir.

Q. 17. Did you after this go in company with Mr. Drawbaugh to Lancaster?

A. During that fall I went to Lancaster City with him.

Q. 18. Did you have any conversation in regard to his talking-machine then?

A. On the way coming home.

Q. 19. What did he say to you about his talking-machine?

A. Says he was working at a machine to talk to people through wire—on wire—in a box of some kind in place of telegraphing.

Q. 20. Were you looking at or talking about anything on the road that led you into this train of conversation?

A. Noticed the telegraph posts—speaking about telegraph

Q. 21. Did Mr. Drawbaugh say at what distance he could convey speech by means of his talking-machine?

A. Didn't mention just the exact distance, but it would be at a distance.

Q. 22. Do you know what business took you and Mr. Drawbaugh to Lancaster, at the time, and to what factory you were going?

PHONE COMPANY,-1

A. Getting a milling-machine up for to make this patent bar at the Lancaster File Company.

Cross-examined by Mr. Storrow:

Cross Q. 23. Where were you having the machine built?

A. Mr. Drawbaugh was to build it, and went to Lancaster to see a Lancaster party.

Cross-Q. 24. Were you and Mr. Shopp joint inventors of both of these patents?

A. Of one.

Cross-Q. 25. Which one, and who invented the other?

A. The one dated September, Shopp and myself; and the other,—then, there was three of us

Cross-Q. 26. Who were the three?

A. Mr. Delaney, of Mechanicsburg. He only got it up for us—fixed the slide and got the patent out for us. He improved the slide; that is all he had to do with it. We got it out in his name, because we already had patents on it. Mr. Stouffer, of Lancaster City, had ours in the office at the time.

Cross Q. 27. Did Mr. Stouffer make the specifications for both patents?

A. Only one. Mr. Delaney made the drawings and specifications for the other.

Cross-Q. 28. Where did you live at that time?

A. Churchtown, Cumberland county.

Cross-Q. 29. How far is that from Eberly's Mills?

A. Nine miles, as near as I can tell. I can't tell exactly.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 23d day of May, 1881.

FRED. M. OTT,
Examiner.

HENRY BONHOLTZER.

JACOB S. SHOPP, *being affirmed and examined, saith:*

Q. 1. State your age, residence, and occupation.

A. Well, I'll be forty-six on the 29th of this month; Monroe township, Cumberland county; farmer and stock-grower.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Penna.? If so, how long have you known him?

A. Yes, sir; I know him about twenty years.

Q. 3. Do you recollect visiting Mr. Drawbaugh's shop with Henry Bonholtzer, to have some work done upon a reaper knife?

A. Yes, sir.

Q. 4. When was that?

A. In '69.

Q. 5. How do you fix the date?

A. It was shortly after we received a patent on a harvester knife.

Q. 6. Can you give from memory the date of your patent?

A. The 14th of September, 1869, as near as I can tell.

Q. 7. You and Mr. Bonholtzer had taken out another patent before that, had you not?

A. Yes, sir; in connection with Delaney.

Q. 8. Do you remember whether your visit to Mr. Drawbaugh's shop was before or after your second patent was taken out?

A. After the second.

Q. 9. State what took place at Mr. Drawbaugh's shop during that visit, if anything, relating to talking-machines.

A. Well, he said that he was working at a machine by which he intended to convey voice.

Q. 10. In what part of his shop did that conversation take place?

A. In his office.

Q. 11. Was Mr. Bonholtzer present at the time?

A. He was.

Q. 12. How came Mr. Drawbaugh to refer to the matter at that time?

A. Well, he just simply said that he wanted to show what he had been working at.

Q. 13. Did he show it to Mr. Bonholtzer?

A. Well, he called my attention to it; he didn't mention Bonholtzer's name in the first place.

Q. 14. How did he call your attention to it—what did he say at the time?

A. Well, he said he had a thing here which he thought, if he could succeed, would be a good thing; said he wasn't in the habit, though, of showing it to everybody.

Q. 15. Did he tell you at that time how far he could talk through the machine?

A. No, sir; not at that time.

Q. 16. Please look at the machines now shown you, marked "A," "B," "C," "D," "E," "F," and see if you recognize any of them as the machines which Mr. Drawbaugh showed you at that time.

A. Well, I saw this one [indicating "B";] I saw this glass tumbler [indicating "F";] I didn't see the others at that time, that I recollect of.

Q. 17. Did you ever see this machine "C" at any time? If so, can you tell me about when you first saw it?

A. I saw it some time in '69. I don't recollect what time I was there, though; I was there every week or two.

Q. 18. When w s the last time that you were at Mr. Drawbaugh's shop?

A. It was either '74 or '5.

Q. 19. Did you get a pump fixed at that time?

A. No, sir.

Q. 20. You have never been there since, have you?

A. No, sir.

Q. 21. Did you see any talking-machines at that time?

A. Yes, sir; I saw some models.

Q. 22. Please look at the machines before shown you, marked from "A" to "F," and state whether you recognize any of them as seen by you at Mr. Drawbaugh's shop at the time of that last visit.

A. Well, I saw those two small ones [indicating "D" and "E."] That I saw also [indicating "A."]

Q. 23. Were you at Mr. Drawbaugh's shop a number of times from the year 1869 to the last visit referred to?

A. Yes, sir.

Q. 24. State whether or not you had seen this machine "A" before the time of the last visit referred to.

A. I may have seen it before. I can't say positively.

Q. 25. In any of those visits that you have referred to, did Mr. Drawbaugh talk through the machines, or did you hear anybody talk through them?

A. No, sir; I was always too much in a hurry.

Q. 26 After the time when you saw these two machines "D" and "E" at Mr. Drawbaugh's shop, when and where did you next meet Mr. Drawbaugh?

A. It was some time in the early part of '76. I think it was in the month of February; Mechanicsburg, Cumberland county.

Q. 27. At that time at Mechanicsburg, did you have any conversation with Mr. Drawbaugh about talking-machines? If so, what was it?

A. He said, "You ought to come down now and see my arrangements I have got now." I said, "I would if I had the time." He said, "talking-machine."

Q. 28. State all of the conversation that you remember.

A. I asked him whether he was going to exhibit at the Centennial. He said, "I would, provided I can raise funds enough to do it." He says, "I haven't got the money to go ahead as I would like." That is about all the particulars.

Q. 29. How long was that conversation after you had first seen these two machines "D" and "E?"

A. Well, I saw those two models some time in 1874 or '5, and this conversation was in the early part of '76, probably about February.

Q. 30. Did a person named Weeks visit you some time last summer or fall, for the purpose of taking your affidavit about Mr. Drawbaugh's talking-machine?

A. Yes, sir.

Q. 31. Who was with him at the time?

A. Mr. Weaver—Theophilus Weaver—of Harrisburg.

Q. 32. Did they say what they wanted your affidavit for?

A. Well, I can make an explanation here. The first time that I saw them, they were at my place of residence. We had no Justice of the Peace in our place at the time. I was just about going away at the time. They insisted having my deposition that day. I told them that it would not suit me that day; that is, to go with them a distance. I was going to Mechanicsburg in a few days, and if that would suit them I would meet them there. They said that would do. They would meet me at the American House. When I came to the American House, there was nobody there but Mr. Weeks. He then took my deposition. After he had taken it, I asked him in whose interest this was taken. He replied, "Not particular in anybody's." We then went to a Notary Public and I qualified to it.

Q. 33. When Mr. Weeks took your deposition, did you tell him that Mr. Drawbaugh had shown you his talking-machines in 1869 or '70?

LEPHONE COMPANY,-1

A. I said I seen it in '70 or probably earlier than '70.

Q. 34. Why did you not fix a time for him more closely?

A. Mr. Bonholtzer had our papers for our patent on harvester cutter, and I didn't recollect the exact date of the patent.

Q. 35. When Mr. Weaver and Mr. Weeks came to your residence to get your affidavit, did either of them say that they came as friends of Mr. Drawbaugh?

A. Mr. Weaver said he always was friendly to Drawbaugh.

Q. 36. Did what he said give you to understand that their visit was of a character friendly to Drawbaugh?

A. I inferred so from what Mr. Weaver said.

Q. 37. When Mr. Drawbaugh showed you and Mr. Bonholtzer his talking-machine in 1869, did he say whether it was operated by electricity or not?

A. I don't recollect that.

Q. 38. At the time he showed you the instrument "B," was this little electro-magnet on it to your recollection?

A. There was two of those little wire coils on it.

Q. 39. When he was showing you the talking-machines at any time at his shop, did he say what he was going to do with them, or how they were going to be used in talking to a distance?

A. Well, all he said to me was, that the object was to convey voice through it.

Q. 40. Did he say anything about telegraphing in connection with remarks about the talking-machines?

A. I inferred from his conversation that it would be a substitute to be used in place of telegraphing.

Cross-examined by Mr. Storrow:

Cross-Q. 41. Have you ever made any affidavit about these machines other than the one you have told?

A. I made an affidavit in the presence of Mr. Jacobs.

Cross-Q. 42. When was that?

A. That was in the fall of 1880.

Cross-Q. 43. What time in the fall?

A. I don't recollect the exact date; it was in the fall of the year.

Cross-Q. 44. What month?

A. I think it was in October.

Cross-Q. 45. Where did you make it?

A. At my place of residence.

Cross-Q. 46. Who came there with Mr. Jacobs?

A. Mr. Drawbaugh and Mr. Bowman.

Cross-Q. 47. Did they tell you what they wanted it for?

A. They said they wanted my testimony,—it might be needed.

Cross-Q. 48. Did they tell you what it might be needed for?

A. They said that there was opposition,—I think he said, called the Bell Company. I don't recollect the exact words he used.

Cross-Q. 49. Opposition about what?

A. I asked him no questions.

Cross-Q. 50. Did he tell you where the opposition was, or that there was going to be a trial?

A. He expected there would be.

Cross-Q. 51. Did they tell you that a suit had been brought?

A. I don't recollect that they did.

Cross-Q. 52. You say you understood that Mr. Weaver was friendly to Drawbaugh; I suppose you would not have taken the trouble to go to Mechanicsburg if you had not thought he was, would you?

A. I consider that an insult. I never asked Weaver the question whether he was friendly to Drawbaugh; it was an overture of his own.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 23d day of May, 1881.
FRED. M. OTT,
Examiner.

JACOB S. SHOPP.

Adjourned for dinner until 1.30, P. M.

May 23, 1881, 1.30, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

JOSEPH MUSSER WISLER, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. Thirty-seven; New Cumberland; I am a heater at the steel works, in Steelton.

Q. 2. Are you acquainted with Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Penna.? If so, how long have you known him?

A. Yes, sir; I have knowed him since about '61.

Q. 3. Did you build the house that you live in at New Cumberland? If so, when?

A. Yes, sir; I finished it in the spring of '77.

Q. 4. When did you commence it?

A. I commenced it about harvest, in '76, somewheres after the harvest—about August or September, I think it was.

Q. 5. What house did you live in before you finished that, and moved into it?

A. Mr. Brownwell's house at New Cumberland.

Q. 6. How long did you live in Mr. Brownwell's house altogether?

A. I lived in it about three years.

Q. 7. What time in '77 did you move into your own new house?

A. It was in the spring—latter part of March or first of April.

Q. 8. Then you lived in Mr. Brownwell's house from the spring of '74 to the spring of '77. Is that the fact?

A. Yes, sir; that is, as near as I can recollect.

Q. 9. Before you moved into Mr. Brownwell's house, where did you reside?

A. In New Market, York county.

Q. 10. How long did you live at New Market in all?

A. I lived there six years.

Q. 11. While you were living at New Market, were you ever in Mr. Drawbaugh's shop, at Eberly's Mills?

A. Yes, sir.

Q. 12. Did he show you a talking-machine?

A. Yes, sir; he did.

Q. 13. Please look at talking-machines now shown you, marked "A," "B," "D," "E," "F," and state whether you recognize among them the talking-machine, or machines, that Mr. Drawbaugh first showed you.

A. This [indicating "B"] is the first one he showed me.

Q. 14. Do you recollect whether you saw "F" at the same time?

A. Well, I might have seen it, but don't recollect of it.

Q. 15. Where were you living when you saw machine "B" for the first time?

A. In New Market.

Q. 16. Did you hear anybody talk through the talking-machine at that time?

A. No, sir; he merely explained the idea and his intentions what he expected to do with it.

Q. 17. What did he say he expected to do with it?

A. Well, he said the idea was to talk to a distance. He said that he could attach a wire to it and he could talk for ten miles. "Well," he said, "I might talk further." As far as he could have a circuit around, they would hear the same thing that he would talk into.

Q. 18. Please look at the machines "D" and "E," now shown you, and state whether you ever saw them at Mr. Drawbaugh's shop, at Eberly's Mills. If so, when did you first see them there?

A. These two machines [indicating "D" and "E"] I saw there,—the spring of 1875.

Q. 19. What did Mr. Drawbaugh say about them at that time?

A. Why, I came there and he says, "Here's something I want to show you." He said that he had just finished these [indicating "D" and "E".] He said the idea of these was to talk into one and listen at the other, at the same time. He just took them off the table in this way, [indicating,] and said you can put one to your mouth and talk, and the other to your ear and listen.

Q. 20. Please look at the instrument marked "A," and state whether you ever saw that at Mr. Drawbaugh's shop. If so, when first?

A. Well, I seen this one previous to the time I saw those others [indicating "D" and "E";] it might have been a year,—I am not positive how long, but I remember seeing this before the others.

Q. 21. Were you in Mr. Drawbaugh's shop in September, '76?

A. Yes, sir; I was.

Q. 22. What did you go there for, then?

A. I went there to get a pump fixed—the pipe of a pump.

Q. 23. Did you stop long at that time?

A. No, sir.

Q. 24. Did you see any talking-machines at that time?

A. No, sir; I did not.

Q. 25. How long were you there, then?

A. Well, I might have perhaps been there twenty minutes. I had borrowed a team, and I just went up there and got my pump, and had to return it, so I didn't stay long.

Q. 26. What did Drawbaugh do with the pump pipe?

A. Well, the pump was for a driven well pump, and he cut the thread on.

Q. 27. From the time that you were there about that pump, and down to the first of January, 1880, do you remember of being at Drawbaugh's shop at any time?

A. Well, I might have been there; I don't recollect. It's probable I was there; I used to visit there a good bit.

Q. 28. What was your employment from September, '76, to January 1, 1880?

A. I was working at the steel works, down at Steelton.

Q. 29. Did you ever see anybody talk through any of these machines at any time you went to Mr. Drawbaugh's shop?

A. No, sir; not more than he talked to me and showed me about the machines, as I have testified already.

Cross-examined by Mr. Storrow:

Cross-Q. 30. Who was present at any of these occasions, in Drawbaugh's shop, as you have testified?

A. No person, the last time that I have testified about.

Cross-Q. 31. Who was with you or who was present on any of the other occasions which you have testified about?

A. Harman K. Drawbaugh was there one time that I was there.

Cross-Q. 32. Do you remember anybody else?

A. No one else, except Daniel, of course.

Cross-Q. 33. When did you last see these instruments, before this week?

A. In 1875, I saw "D" and "E" last; I saw "A" previous to the others. I have not seen "B" and "F" since the first time I saw them.

Cross-Q. 34. How many times have you seen any of them this week before this afternoon?

A. I have not seen any of them this week, except to-day when I came to town here.

Cross-Q. 35 Were you summoned to come here by an officer, and, if so, when, and by whom?

A. I was summoned by Mr. Shank, on last Thursday evening.

Cross-Q. 36. And to-day is Monday, is it not?

A. Yes, sir.

Re-direct by Mr. Hill:

Q. Q. 37. Did Mr. Shank tell you to be here on Monday morning?

A. He first told me to be here on Friday. I said it did not suit me, that it would suit me better on Monday.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 23d of May, 1881.

FRED. M. OTT,
Examiner.

J. M. WISLER.

Adjourned until May 24, ten o'clock, A. M.

Tuesday, May 24, 10, A. M.

Examination resumed, pursuant to adjournment.

Present, same counsel as yesterday.

HENRY F. DRAWBAUGH, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. I am fifty-one, or near it; reside at Newville, Cumberland county, Pa.; am superintendent of lumber mills.

Q. 2. Are you a brother of Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pa.?

A. I am.

Q. 3. How long have you resided at Newville?

A. I lived in Newville, and then went to Perry county, and then went back to Newville in 1873, and have lived there ever since. I went to Perry county to build a distillery.

Q. 4. What business were you engaged in in the summer and fall of 1872?

A. Distilling in the fall,—from the last of August on until about the first of December.

Q. 5. Did you have occasion to have any work done that year by your brother at Eberly's Mills? If so, what and when?

A. Yes, sir; I got an apple cylinder and hoisting rigging made in the last of July and first of August, 1872. I was there about two weeks, waiting and helping him.

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Q. 6. Have you an entry of that transaction in any books on which it was entered at that time?

A. Yes, sir.

Q. 7. Please produce the book, and point out the entry to the examiner in order that he may copy it on to the record.

A. Here it is, and this is the entry:

"Repairs before starting to make Apple Jack 1872.
Expenses getting Sillender and hoist rigging at Eberly's Mills and passage there to - - - - - - - - - - 14.20
home. fixing up before starting, three weeks @ - - - - 25.00"

(Witness continues.) The date in 1872 is fixed by this other book, which is the day-book of the distillery, and which shows that the distillery started up on the 28th day of August, 1872. This last book shows that I paid my brother on the 9th day of November, 1872, for the work he had done in the summer of that year.

Q. 8. The charge "fixing up before starting, three weeks @ 25.00," was not a part of the work done at your brother's shop, was it?

A. No, that was another matter.

Q. 9. When you were there at your brother's shop in July or August, 1872, did he show you any talking-machines?

A. He did.

Q. 10. Please look at the machines now shown you, marked "B" and "F," and state whether you ever saw them before; and, if so, when and where you first saw them.

A. I seen them at my brother's shop at the time we was making that cylinder and hoist rigging, in 1872.

Q. 11. What was he doing with them at that time?

A. He was working at them and experimenting.

Q. 12. Do you recollect why it took two weeks for you to get your work done there at the shop at that time? If so, state.

A. He was turning up some walnut machinery for his talking-machine, different from these ["F" and "B"]; and I could not keep him at my work.

Q. 13. Did he and you talk through the talking-machines at that time?

A. Yes, sir.

Q. 14. Could you hear and understand what he said to you through the machines at that time?

A. Yes, sir.

Q. 15. Do you recollect any words that were spoken through the talking-machines ["B" and "F"] at that time—that you heard by means of them?

A. Yes, sir; "Harrisburg is the capital of the State, situated on the banks of the Susquehanna river."

Q. 16. Where were the two machines "B" and "F," when he talked and you listened—in what parts of the shop?

A. Part of the time one was in the shop and one was in the office; and part of the time one was in the cellar and one was in the office.

Q. 17. What business were you engaged in, in the years 1876, 1877, and 1878?

A. I ran a private line of cars of my own to Philadelphia, Baltimore, and New York—market cars.

Q. 18. Have you your books here to show when you commenced and when you stopped running that line of cars?

A. No, sir.

Q. 19. What is your recollection as to the time when you commenced and when you stopped running that line of cars?

A. I started running in May, 1876, and run until some time in the summer of 1878.

Q. 20. Do you recollect whether your nephew, Harman K. Drawbaugh, was employed by you on that freight train while you were running it?

A. He was.

Q. 21. At what time did your father die?

A. Eighth of December, 1878.

Q. 22. Did he die at your house at Newville?

A. Yes, sir.

Q. 23. What was his age at the time of death?

A. Near ninety-one.

Q. 24. What was his physical condition for a year or so before he died?

A. He was very bad—feeble and sick—required a great deal of attention.

Q. 25. How long did he live at your house before his death?

A. He was with me about four years before he died, except a few months that he spent with my brother John, at Eberly's Mills.

Q. 26. How far is Newville from Eberly's Mills?

A. Twenty-eight miles.

Q. 27. Why did you discontinue the freight line in the summer of 1878?

A. I could not get any one to attend to my father and had to stop and attend to him myself.

Q. 28. For some time before you discontinued the freight line, had you been obliged to neglect the freight business and attend to your father?

A. I had.

Q. 29. Between the time when you got your brother to do the work for the distillery in July or August, 1872, and the time when you started up the freight line, were you occasionally at your brother's shop at Eberly's Mills?

A. Yes, sir; quite often.

Q. 30. Did you, during that time from July or August, 1872, up to May, 1876, see your brother making any more experiments with the talking-machine? If so, how often?

A. Every time I was down he was working at it, more or less—experimenting.

Q. 31. From the time when you started up the freight line, in May, 1876, up to the time when you had to give nearly all your time and attention to your father, did you personally go with your trains, or any of them?

A. Yes, sir; myself and Harman Drawbaugh, or "Shorty," as we always call him, and my son.

Q. 32. When you were running with the trains, did you occasionally have to lay over a day, or part of a day, at Bridgeport, on the Susquehanna river, just opposite Harrisburg?

A. Nearly all the time when we came there, which was once a week, we laid over from 9 o'clock in the morning until 7 o'clock the next morning.

Q. 33. During a portion of that time when you were running with the trains, was your father with your brother John, at Eberly's Mills?

A. Yes, sir; a few months.

Q. 34. When your trains would have to lay over at Bridgeport, were you in the habit of going over to see your father and brothers at Eberly's Mills, while the train was so lying over?

A. Yes, sir; nearly every week.

Q. 35. Did you, during that time when you would go out to Eberly's Mills, on the days or nights when the train would be detained at Bridgeport, see your brother making any more experiments with the talking-machines? If so, how often?

A. As a general thing, he was working or experimenting on the talking-machine, the clock, and the motor, all three of them. He always explained them to me and showed me the improvements he was making.

Q. 36. After your father got so feeble as to require the most of your time, were you at Eberly's Mills as frequently as before, or not?

A. No, sir; not while he was so poorly.

Q. 37. How many times do you think you were at Eberly's Mills during the last six months of your father's life?

A. I don't think I was there more than twice. I was there once after some papers he had there.

Q. 38. Do you recollect being there at Daniel Drawbaugh's shop while the electric clock company were operating there?

A. Yes, sir; very frequently.

Q. 39. Was your brother doing anything with his talking-machines at that time, while the electric clock company were operating there?

A. While they were operating there, Grissinger and Dan went to Philadelphia to get some material for the clock company, and Dan wanted to get some materials for his talking-machines at the same time. Dan went with me in my car; Grissinger missed the car and went alone.

Q. 40. While the clock company were operating there at the shop, did you ever see Dan doing anything with the talking-machines at the shop? If so, how often?

A. I don't know whether I can tell you how often. Nearly every time I was down, he would be working at them,—generally at night, when no one was there but myself. He would be showing them to me and explaining them to me. When he would be working at them in day-time, and anybody would come in, he would shove them away quick, so they could not see what he was doing.

Q. 41. From the summer of 1872, down to the year 1879 or 1880, so far as you had opportunity for observation, was your brother continuously studying and working at the talking-machine, or not?

[*Objected to as leading.*]

A. Yes, sir; every time I was down there he was working at it and talking; and wanted me to go in with him and furnish means.

Q. 42. When did he first ask you to go in with him and furnish means for this invention?

A. In 1872, while I got that distillery work done.

Q. 43. And do you mean that he continued to urge you to do so down to 1879 or 1880?

[*Objected to as leading.*]

A. Yes, sir; 'till about 1879. I don't think he said anything in 1880; but he wanted me to lend him money. He asked me to lend him money to buy materials and things for it. I said I would not, but would lend him money to support his family, as he was very poor. This last conversation about lending money was in the fall of 1879. The fall of 1879 was the last time he asked me to go in with him on this invention. I did lend him money afterwards for the support of his family.

Q. 44. Did you give him articles for the support of his family at any time prior to 1879? If so, when and what?

A. I furnished him about seven hundred weight of pork about four years ago. He had not any money to buy it and was poor.

Q. 45. Why did not you go in with him on the talking-machine invention at any time during or after the summer of 1872, when he urged you to do so?

A. I was fearful there was no money in it—get my money out and would not get it back. My brother John said, "Don't encourage him or he will go crazy; he is half crazy now with studying." He was afraid he would lose his mind.

Q. 46. Did you ever hear your brother Daniel's wife talk about his spending his time experimenting? If so, how often, and during what years?

A. I have heard her make mention of it very often during the year 1876 and from that up, not from that back. She said she wanted him to stop his fooling and go off. He had good offers to superintend for other firms and then they would try and live better. They had been living so poor for many years on account of his experimenting.

Q. 47. Did she talk pretty strongly on the subject or not?

A. She did; very.

Q. 48. State whether or not Dan's experiments on the talking-machine subjected him to a great deal of ridicule from others.

[*Objected to as leading.*]

A. Yes; both that and the clock. They claimed he was going crazy. He said, if they was not so ignorant, they could see into it more—they would not think he was crazy.

Q. 49. Is he a man pretty sensitive to ridicule or not?

A. Very.

Q. 50. What effect did the ridicule to which he was subjected have upon him, so far as you know?

A. He would try to hide it from them—from all; really, unless there was some particular ones called in that would not laugh at him, then he would show it to them; but if anybody came in and said, "Oh, Dan, that is a humbug," that man never got to see any more of that thing.

Q. 51. What was your brother's financial condition from 1872 down to 1880?

A. He was poor. The greater part of the time his family was in need of money to buy household provisions; he had a large family. Part of the time he would have a little money and part of the time he was hard up. He would get some some day and use it up for his family, and then he would be always experimenting and not getting any in. At one time he sold a part interest in the clock, and got in some money, but it did not reach to square his debts; it took it all to square up, so that they were just as poor as ever.

Q. 52. State whether or not, during the last ten or twelve years, he has had a good deal of sickness in his family.

A. Yes, sir; scarcely ever without sickness—that family. He buried two children, I think, in one day, or near; and for a long time he had a daughter laying a living skeleton. I never heard of any person so light as she was. He had another daughter who might be called an invalid, as she was subject to spasms. She told me that they had been getting her a great deal of medicine from New York, and that it was doing her a great deal of good, and it was very expensive, and she wanted some more, but they had not the money to get it. Dan told me this, too.

Q. 53. That last mentioned daughter is now a young lady, is she not?

A. Yes, sir; I suppose she is twenty-one or twenty-two years of age.

Q. 54. Is she still subject to epilepsy?

A. Yes, sir; and her mind is disturbed.

Q. 55. How long has she been subject to this disease?

A. I can't tell exactly; I think the first they noticed it on her, was about the time of puberty.

Recess for dinner until 2 o'clock, P. M.

Examination resumed, pursuant to adjournment, at 2 P. M.

Suspended, by consent, to take the deposition of Peter Z. Zimmerman.

Q. 56. You have stated that your brother Daniel endeavored for a good many years to get you to go into the talking-machine with him. Do you know whether he tried to get others to go in with him, besides you?

A. He told me that he had asked a great many to go in with him. I was not with him when he asked them, but he got me to see others for him, and I have seen different parties for him.

Q. 57. Some time between 1867 and 1870, after your brother Daniel sold out an interest in the faucet patent to the faucet company, known as the Drawbaugh Manufacturing Company, did he and you buy a homestead for your aged father and mother?

A. Yes; we bought it in the fall of 1868.

Q. 58. How much money did he contribute towards the purchase of that homestead?

A. One thousand dollars.

Q. 59. And how much did you contribute?

A. About twenty-seven hundred.

Q. 60. When did your mother die?

A. She died in the fall of 1869.

Q. 61. After your father got through with that estate, was there anything left of it to divide among his heirs?

A. Owing to the depreciations in the value of property, and some money that my brother-in-law was to have put in and did not, he pleading the statute of limitations after my sister's death, and debts having accrued, the whole estate was exhausted, so that I had to bury my father myself; I never got a cent out of the property. I have had to pay some of the debts over and above what the property brought. After my father's death I had to get the grave-stones, and my brother Daniel promised that, whenever he was able, he would give me fifty dollars towards it, but he never has yet, because he has not been able.

Q. 62. Did your brother Daniel contribute anything to your father's funeral expenses, and if not, why not?

A. No, he did not. He said he did not have anything, but he said that if ever he was able he was going to repay me for what I did for our parents.

Q. 63. Was Daniel in the habit of showing his talking-machines much to his brother John, and if not, why not?

A. He did not show it much to John, because John was always jawing him for working at something like that, and for not working at something that would pay him regular wages. He said he needed it for his family, and here he was working and always experimenting at something that did not pay him, or something like that; that he would go crazy with it after a while, and Dan did not like to show it to him.

Q. 64. Were you ever in the shop with Dan when he was working with the talking-machines, and when he would hear somebody coming into the shop that he thought might be his brother John? If so, what have you observed him do on such occasions?

A. When he was working in the shop there at the telephone, or talking-machine—we had no other name for it then—and we would hear any one coming, he would bustle and hide it away; and several times, as I was there, I looked out of the window and seen it was John, and I said it was only John; he put it away all the quicker. He said: "John is always finding fault."

Q. 65 Why was he willing to show it to you more than to John?

A. There were two reasons for that. One was that he wanted me to furnish the money; the other reason is, that I would not discourage him, but would assist him, when no one was there, to experiment on it, and say nothing about it to any one.

Q. 66. After you saw the original machines in the summer of 1872. did you afterwards, from time to time, as you would be at the shop, down to the year 1880, see him working on any other talking machines?

A. Yes, sir; quite a lot of other machines that he was working at different times—different parts—it was intended for the same machine, I suppose.

Q. 67. Are you able to fix the dates of any other machines that you saw after the first ones?

A. Nearly every time I came to the shop from that up, he had some of his machines there. I saw he was experimenting. I often stayed there in the evenings with him or with my brother John. After supper in the evening, he would generally say, "Now, Harry, come along down to the shop, I want to experiment." We would go down to the shop, and lock the shop, and we would often stay there 'till midnight. Then he would adjust it and attach it to the wires, and then he would have me running down into the cellar, back and forth, listening

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and talking into it, until I got that tired that I thought I could not stand it, but I did not want to discourage him.

Q. 68. When you would be with him so late at night, while he was experimenting on the talking-machines, and while he was working at the machine and getting ready for some experiments, did you always keep awake yourself?

A. No; he had a large drafting board in the shop on trestles, and I would lie down on that and take a nap, and when he wanted me he would wake me up.

Q. 69. Do you remember others being in the shop in the evening?

A. No, sir; he would not have no one else in, at least when I was there. I don't know what he did when I was not there. When I was there, he did not want to be bothered, and did not want anybody to know anything about it.

Q. 70. Did you ever know him, when anybody was there after supper time, to shut up the shop and go away in order to get clear of them, and then afterwards return and spend the evening at his experimental work?

A. Yes. On several occasions, when parties were in there sitting around, and would not go away, he would say, "Well, I believe I will go home." He would go up to the house 'till they would get out of sight, then we would go back to the shop. He fooled Cal. Row away that way one night, and the miller at the lower mill—I don't know what his name was. The miller came in there to talk about a water-wheel.

Adjourned until May 25, 1881, at 10 o'clock, A. M.

May 25, 1881.

Examination resumed, pursuant to adjournment.

Present, Mr. Smith and Mr. Storrow for complainants, and Mr. Hill, Mr. Jacobs, and Mr. Abraham for respondents.

[*Examination of Henry Drawbaugh continued.*]

Q. 71. Please look at machines now shown you, marked "A," "C," "D," "E," "G," "H," "I," "J," "K," "L," "M," "N," "O," and see if you recognize any of them as machines which you have seen at your brother's shop heretofore. If so, please point out the particular machines which you are now able to identify positively.

A. "C" is one, and "I" is another. I seen those before I saw this ["A."] This machine "A," I recollect, came after "C" and "I." I saw all those three and "D," before I commenced running the cars. While running the cars and from that up, I was in the shop a great deal. These, [indicating "E," "G," "K," "L," "M," "N," "O,"] all look to me about alike. I can't tell tother from which. I identify this machine "A" by the mouth-piece on one side of the center, and this machine "D," by the curled magnet on the back of it. I identify the machine "H," also. I remember seeing him working at it in the shop. I was helping him on that machine, I remember. I don't remember anything about "J." I have seen all the others, "E," "G," "H," "L," "M," "N," "O," and helped him operate them, while I was running the cars and later. I remember talking through them and listening at them, but I can't tell which first, and which last. I can't remember the order in which they came along. I remember another machine, which I do not see here; that was among the first that he was working at. It was a shoe-blacking box, or of that order. It looked to me like a large shoe-blacking box. It had a drop of solder inside, and a point on a spring, and some fixings inside, and some wires. He was working at it and adjusting it; that was in 1872. Then he told me he was going to make a machine to talk instead of using the signal key to telegraph; that was among the first things he told me about it. I then asked him how far he could talk with it. "Oh," he said, "across the continent."

Q. 72. How many of these machines that have been shown you, and that you recollect seeing there at the shop from time to time, did you ever talk through, or hear anybody talk through, at the shop, from 1872 down to 1880?

A. I never seen anybody talking through them, but Dan and myself. He never would do anything with them, when anybody else was in the shop, when I was there, except that his little boy would be there sometimes. I guess we talked through pretty near all of them. I can't tell those machines, "E," "G," "K," "L," "M," "N," "O," apart. He was working at them, and we talked through them, nearly every time I was there, but I can't tell them apart.

Q. 73. To the best of your recollection, about what time did you first see this machine "H," with the bell on top?

A. I seen that while I was running the cars. My impression is that it was the first year; it may have been the latter part of the year.

Q. 74. Did you ever talk through it, or hear him talk through it?

A. He was experimenting a good deal on that. He was using that machine—was experimenting and trying it. He had a wire through into the office.

Q. 75. To the best of your recollection, about what time was it that you first saw this machine "A"?

A. Shortly after the time that I got that apple arrangement, or cylinder made; it might have been the next summer.

Q. 76. I understand you that you saw these two, "C" and "I," before you first saw the machine "A"; am I correct or not?

A. I seen "C" and "I," shortly after I got the apple cylinder made;—before I saw "A"; that is my recollection.

Q. 77. What is your best recollection as to the time when you first saw this machine "D"?

A. My impression is that I seen it before I started running the cars; I could not tell what year. I recollect it by that curve.

Q. 78. Did you and Harmon Drawbaugh conduct the same trains, or different trains, while he was in your employ?

A. The cars all run together to Reading. From there he would go to New York by way of Allentown, and I would go to Philadelphia.

Q. 79. Do you recollect talking through or listening to this machine "D" before you ran the cars?

A. Yes, sir; I think it was the summer before.

Q. 80. When you were experimenting with your brother Dan, during the time that you were running the cars, or before, did you use one instrument to talk into and another to listen at, or did you use the same instrument to talk into and to listen at, or did you use the instruments in both the ways that I have mentioned? State your recollection upon the whole matter referred to in this question.

A. When I helped him, there was always one at each end of the wire. When he was working at night, he always had the wire long enough, so that he could have it at the work-bench, and work, and file, and adjust it without disconnecting the wire. (Question explained to witness and explanation illustrated by machine "D." Witness continues.) We talked and listened in the same one. If we were using this one, "D," we would talk into it and then put it to the ear to receive the answer. I think we used "B" and "F" the same way, but I won't be positive about it, because it was so long ago. I know that we used "D" that way.

Cross-examined by Mr. Storrow:

Cross-Q. 81. Did you ever talk through "I" and "C?"

A. That is my impression, sir—yes, sir.

Cross-Q. 82. Were those two used together—one to be talked into and the other listened at?

A. I think so.

Cross-Q. 83. Which of them was talked into, and which one was listened at, if you remember?

A. It is so long ago. I recollect that we used them, but I can't tell how we used them—which way, or whether we used these two together.

Cross-Q. 84. Are they in the same condition now that they were when you used them?

A. Well, I did not look into them then. There was a wire attached, and [taking "I" in his hand and touching the mouth-piece] I think there was something in this hole. I don't know whether "C" is in the same condition now that it was then or not. I think there was something inside of it, too. When he was working at it, Dan would be taking them apart and putting them together every few minutes, until I was so tired that I was glad to have it over. I only did it to accommodate him, not because I wanted to.

Cross-Q. 85. I suppose that, in all the experiments with all the instruments, he was doing just that way--taking them apart and fixing them, and making you wait while he did it, and then making you try them again with him, was not he?

A. A great portion of the time. Then, sometimes, he would say, "Do you hear it plainer now?" and sometimes I would hear it plainer, and sometimes I would hear no sound at all. I was getting tired of it.

Cross-Q. 86. Did you ever have any talk with him about going in with him on any other of his inventions, or about manufacturing any other things that he had invented?

A. Yes, sir.

Cross-Q. 87. What was it?

A. The faucet; also the clock.

Cross-Q. 88. When did you have any talk with him about going into the faucet business with him?

A. That was the summer before father died; in fact, the two years before he died.

Cross-Q. 89. Did you make any plans about going into the faucet business with him, or make any arrangements with reference to it?

A. Yes, sir; I did. I made some plans, but they were not carried out.

Cross-Q. 90. What were your plans, and why were they not carried out?

A. There had been a bark-mill owned by Dr. Ahl, and it was turned into a splint factory. I wanted to buy it for to make it into a machine-shop. I wanted to buy it, and waited for about six months for a decision, whether I could get it or not. I only found out a few weeks before father died that I could not get it. "Shorty" was waiting about six months, or in that neighborhood. He was to be foreman of the shop. He was working part of the time in the telegraph office, but he did not like it, and then he started down to Houck's.

Cross-Q. 91. If you could have got that mill when you first tried for it, were you going to give up your freight line?

A. Yes, sir; I had given up the freight line a short time before that, on account of father.

Cross-Q. 92. Did your brother ever get anybody to go into the faucet business with him, on that faucet that you and he talked about?

A. I don't know whether he did or not. I think—at least they manufacture them—Chellis and him. I don't know whether he went in with him on the patent or not. Chellis and he are manufacturing them, any way.

Cross-Q. 93. When did Chellis go in with him?

A. Two years ago, I think. That was when they commenced manufacturing them.

Cross-Q. 94. When was it that your brother first asked you to go in with him on the clock?

A. That was the summer before Shettle and Grissingers' went into it.

Cross-Q. 95. Do you remember what year it was that he asked you?

A. I guess it was in 1875 or 1876; he asked me different times. He waited quite a while on me. I only gave him my decision about a week before Shettle went into it.

Cross-Q. 96. Is the instrument "D" in the same condition now that it was in along about the time that you first used it?

A. No, I think it had a kind of wooden bottom on it. I don't recollect how the wire was attached—it had a wire on somewhere, and a bottom on it.

Cross-Q. 97. Are you a mechanic? Do you understand the business of a mechanic?

A. Some branches, I do; yes, sir.

Cross-Q. 98. How much were you at your brother's shop before the summer of 1872—say from 1865 up to 1872?

A. I was there occasionally—not very much.

Cross-Q. 99. What made you go there in 1872 more than before?

A. I was getting work done in 1872.

Cross-Q. 100. Were you ever in the distilling business, except distilling apples in Perry county, as you have testified?

A. No, sir.

Cross-Q. 101. How long were you in that business in Perry county—from what year to what year?

A. I run about three months in the fall of 1869, and about three months in the fall of 1872. I commenced on the 28th of August and run 'till the apple season was over.

Cross-Q. 102. Did you ever hear of anybody, besides your brother, having made telephones that would talk?

A. I did not know what a telephone was until once I was in the shop. He then told me there was a man called Edison, who lived in New Jersey, at a place called Glenlo Park—at least that is the way that I remember the name—that had made a talking-machine, and that it was his invention, and he was going down to see him about it. He said it was called a "telephorn;" that was the meaning of it, but I don't give it the right pronunciation. He says then: "If you had give me the money, or helped me, or got somebody to go in with me, that man would not have got my invention." I then told him I would do as I had done before—that I would give him money if his family was in need, as I had done before, and would do again, but that I had worked hard for my money, and did not propose to put it into anything that I did not see the dollars and cents in.

Cross-Q. 103. When was it that he told you this about Edison?

A. This was about—well, it was while father was in my house. I guess it was in 1877 or 1878, along there.

Cross-Q. 104. Was it while you were running your cars?

A. I rather think it was during the latter part of the time I was running the cars.

Cross-Q. 105. Did he tell you how he had found out that Edison had a telephone?

A. He did not tell me. He said he had one; but I don't know that he told me how he had found it out.

Cross-Q. 106. Did he show you anything in a newspaper or book about it?

A. I don't think he did; I think he just told me.

Cross-Q. 107. Did he afterwards go and see Edison about it?

A. I don't know whether he did or not.

Cross-Q. 108. Did you ever have any more talks with him about Edison's telephone?

A. I may have; I don't recollect of anything.

Cross-Q. 109. Did you ever have any talk with him about any other person's telephone?

A. No, sir; I think not. I don't know that there is any.

Re-direct by Mr. Hill:

Q. Q. 110. Why were you more willing to go in with him on the faucet than on the clock or telephone?

A. As regards the faucet, I knew more about that. They had a faucet there, and I knew that the demand was great—that they sold high, and this faucet could be made for less money. It was a simpler faucet, and I knew that there could be a great many sold. There was money in it; that I could see. The old faucet was the one the old company sold to Hauck. Now, he kept at me quite a while about the clock. I knew that the clocks were good, because he had one running in the shop for a long time—for years—a little round thing. I thought I would go in with him and pay for the patent, and get a good clock for it, anyhow. When he told me that he thought he could get a thousand dollars for it from Mr. Shettle and others, I told him to let them have it quick. I wanted him to get the money to pay his debts.

Q. Q. 111. Did not you think there was any money in a machine by which one man could talk to another a long distance away?

A. No, sir; I did not think there was anything in that. I talked to an operator, and this is what he said: "It will never do. Telegraphing and this kind of news are strictly private. Everybody could take it off around at different points. There will never be a thing like that introduced. It won't be no good."

A. No, I think it had a kind of wooden bottom on it. I don't recollect how the wire was attached—it had a wire on somewhere, and a bottom on it.

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Q. Q. 112. Did your brother Dan at one time offer to make you a present of the faucet invention?

A. Yes, sir.

Q. Q. 113. Why did he do that?

A. Because I had taken care of my parents. He said he would give me that as his proportion as an equivalent, as he had not the money to give me.

Q. Q. 114. Did he say that before you endeavored to get the bark-mill for the purpose of manufacturing the faucet?

A. Yes; a couple of years before that.

Re-cross by Mr. Storrow:

Re-cross-Q. 115. Was not your brother's proposition to you about the faucet, that he would prepare the specifications, drawings, and models; that you should pay the cost of getting the patent and start the manufacture, and that both of you should have an interest in the patent?

A. Not on the faucet, but on the clock.

Re-cross-Q. 116. You mean that was the proposition on the clock?

A. He proposed that he would get up specifications and drawings; would have it patented, and he would go in partners; I would pay the expense. That was on the clock, but the faucet he would give to me for what I said before. At one time, it was spoken of that we should go in on both patents, the faucet and clock, but in the end he said that he would give me the faucet, as I have stated before.

Re-cross-Q. 117. Look at the machinery on the inside of the cover of "H;" there are there two brass springs over the center, and one blue steel spring off at the side. Were all these three springs on it when you first saw it?

A. I can't tell whether three springs were on it or not. At the time he was working at the machine he was adjusting it, and putting it together and experimenting. I know there was one spring he was working at that was to be so easily moved that he said you could scarcely tell how light it should be made. This is the one, I think, [indicating the outermost brass spring,] he was working at. He was putting plumbago in at the time, and I did not know what plumbago was, and I don't know yet. He was explaining it to me; I did not understand, but I only remember the name. I just looked at it when he was working at it, and I can't say whether it had three springs or not.

Re cross-Q. 118. When did you have the talk with the telegraph operator that you have spoken of?

A. I think it was about six years ago. The reason is that in 1875 I was not in any business at all and I think that was the time.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to, this 25th of May, 1881.
FRED. M. OTT,
Examiner.

HENRY F. DRAWBAUGH.

Recess for dinner until 2.30, P. M.

May 25, 1881, 2.30, P. M.

Examination resumed.

Present, same counsel.

HENRY F. DRAWBAUGH *recalled.*

Examined by Mr. Hill:

Q. 1. You have referred in your deposition this forenoon to a conversation with your brother Daniel about Mr. Edison's inventing a telephone. You have also referred to a conversation with your brother Daniel about the adjustment of the springs, and the use of plumbago, in the machine "H." Which of those two conversations occurred first?

A. Is the machine "H" that long one with the bell on? I want to know that. [Examiner informs witness that it is. Witness then continues his answer.] The conversation regarding the use of plumbago in that machine was before I knew anything about Edison having a talking-machine.

Q. 2. What is your best recollection as to how long before?

A. While I was running the cars yet, Dan wanted me to bring some chemicals with me from Philadelphia,—plumbago among the rest, for that purpose; and as he did not give me the money, I did not bring them, and I did not know anything about Edison until after I quit running the cars, or about the last of my running.

Q. 3. That does not quite answer my question. What I want to get at is this: how long the conversation with Dan about adjusting the spring, and about using plumbago in the machine "H," with the bell on it, was before the talk about Edison?

A. It was while Dan lived at Mechanicsburg that Dan came to my car at Mechanicsburg and wanted me to bring it with me. That was the first time I ever heard the name plumbago. On my return I found him working with some in his shop, and I suppose he got it at Harrisburg.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 24th day of May, 1881.

FRED. M. OTT,
Examiner.

HENRY F. DRAWBAUGH.

PETER C. ZIMMERMAN, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. Age, going on fifty-six; residence, Shiremanstown, Cumberland county; occupation, wheelwright.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Penna.? If so, how long have you known him?

A. I have known him for forty-five years, at least. We were schoolmates together.

Q. 3. How long have you lived at Shiremanstown, where you now live?

A. Ten years last April; since April, 1871.

Q. 4. Do you recollect being at Mr. Daniel Drawbaugh's shop, at Eberly's Mills, before you moved to Shiremanstown?

A. Yes, sir.

Q. 5. Did he ever show you any talking-machines there, before you moved to Shiremanstown?

A. Yes, sir.

Q. 6. How long before you moved to Shiremanstown?

A. Some time in February or March, 1871. I could not identify the month, except that it was one of those named. It was just a little while before I moved.

Q. 7. Describe the talking-machines that he showed you.

A. There were two spools like; two coils of wire rolled up together, on a little piece of board, and a copper wire attached to it, and under the end of it there was a little tin spring. There was a little box like a coffee essence box, with little drum-heads in it like—something like a drum-head. I think it had heads at both ends. I saw something like a cup, and a broken tumbler like, and these were lined inside with plaster-of-Paris.

Q. 8. After you saw those machines in Drawbaugh's shop in 1871, when did you see them again?

A. I saw them again when I saw Mr. Drawbaugh and Mr. Jacobs have them. I never saw them again 'till then. I then identified them, before ever I saw the machines.

Q. 9. Did Mr. Drawbaugh, or Mr. Jacobs, come to your house, or shop, at the second time that you saw them, as you have testified?

A. Yes, sir; to my shop.

Q. 10. You say that when Mr. Drawbaugh and Mr. Jacobs came to your shop, you identified the machines before you saw them. Explain what you mean by identifying them.

A. I mean to say that I knew it to be the self and same machine that I saw before.

Q. 11. How did you know that before you saw them?

A. Because I recollected and knew when they mentioned the talking-machine. I knew exactly what it was, and knew what I had saw, and knowed what to tell them, and it was in my mind fresh, just as though I had saw it the day before.

Q. 12. Did you describe the talking-machine to them before they had shown you the machines, or not 'till afterwards?

A. Yes, sir; before they showed it to me.

Q. 13. State whether you have ever seen those machines since the time Mr. Drawbaugh and Mr. Jacobs showed them to you at your shop.

A. No, sir; I have not saw them since.

Q. 14. Have you seen them to-day, since you came here to Harrisburg to testify?

A. No, sir; I have not saw them.

Q. 15. I will now show you two machines, marked "F" and "B," and ask you whether you ever saw them before; and if so, when and where, and are they the same machines referred to by you in your testimony?

A. Yes, sir; those are the same machines.

Q. 16. When you saw them in Mr. Drawbaugh's shop in 1871, did you hear anybody talk through them?

A. No, sir.

Q. 17. Did Mr. Drawbaugh tell you at that time that he had talked through them, and that the words talked through them could be heard and understood through the machines?

[*Objected to as incompetent.*]

A. Yes, sir.

Q. 18. Did he tell you how far anybody could talk through them so as to be heard and understood?

[*Same objection.*]

A. Yes, sir.

Q. 19. State what he said about it.

[*Same objection.*]

A. He said it could be heard hundreds of miles.

Q. 20. Did he tell you on what principle the machine operated? If so, state.

A. He said it was electricity that would pass it over the wires; that it would carry the sound right along.

Q. 21. Did he make any remark comparing it with the telegraph in any way?

A. Yes, sir; he said it would be much easier and better than the telegraph, and would supersede it.

Q. 22. Do you recollect whether anything was said about the copper wire on the spools at the time when you saw the machines in 1871? If so, what?

A. He said that the copper wire on the spools was to give a length to the wire. I asked him what the green stuff on the wire was for. He said that it was to keep one wire from another, and so that the electricity and sound would pass all over without interfering.

Q. 23. What, if anything, was said about the fineness of the copper wire?

A. I asked him where he got such fine copper wire. He said that he got fine wire and drawed it finer himself. He made it as fine as it is.

Q. 24. After you moved to Shiremanstown, did you tell anybody what you had seen at Drawbaugh's shop, and what he could do with the machine?

A. Yes, sir.

Q. 25. How long was that after you had seen the machine?

A. It might have been a month, or it might have been two. It was after I lived there a while.

Q. 26. What remarks were made about you in consequence of your telling about it and expressing your belief in it?

A. That I was crazy.

Q. 27. When did Mr. Drawbaugh and Mr. Jacobs visit you at the time you referred to?

A. Some time last winter. They were there in a sleigh.

Q. 28. Have you ever been visited by a couple of gentlemen who professed to be taking subscriptions for a book on telephones?

A. By one man, sir.

Q. 29. When was that?

A. It was this spring. There was snow on the ground, and it was sloppy weather.

Q. 30. Did he give his name?

A. No, sir.

Q. 31. What was said and done at the time when he visited you?

A. He handed me the book. I looked at it and turned the leaves over. Then he took the book and turned it over several leaves, and said, "Here is a telephone," saying, "This was Bell's invention." I said, "Ah, not so; this is Mr. Drawbaugh's invention. Some one is trying to steal his rights." Then I replied, "You had better leave; you can't make anything here." Then I stated to him, when he took the book, looking in the front of it where he took subscriptions, "Why, you have no subscribers." Then he replied, "I have a book in my pocket, where I have their names in." I told him I did not want to see his book, and advised him to leave. He left and I have not seen him since.

Q. 32. What impression did you get about him at that time, or about his business in coming to see you?

A. That he was a spy.

Cross-examined by Mr. Storrow:

Cross-Q. 33. Did you ever see anywhere else any spools of wire?

A. No, sir.

Cross-Q. 34. Where did you live before you moved to Shiremanstown?

A. At New Market, York county.

Cross-Q. 35. How long did you live there?

A. One year.

Cross-Q. 36. Did you ever go to Drawbaugh's shop, after the time you have testified about?

A. No, sir.

Cross-Q. 37. Did not you think it was a crazy thing to think of carrying sound over a wire, or any way except through the air, after the fashion of ordinary conversation?

A. No, sir.

Cross-Q. 38. It seemed to you quite natural, did it?

A. Yes, sir; the reason why, was, I knew it would pass through a piece of timber, no odds how long. I knew if you scratched at one end, you could hear it at the other end, quite distinctly.

Cross-Q. 39. Did you ever tell your neighbors that you knew that, and if so, was not that the reason they remarked that you were crazy?

A. Yes, sir.

Cross-Q. 40. Have you seen Mr. Drawbaugh or Mr. Jacobs to talk with them since the visit which you say they made to your shop?

A. I have seen them, yes, sir; several times since.

Cross-Q. 41. When and where?

A. In Shiremanstown, at my place of residence.

Re-direct by Mr. Hill:

Q. Q. 42. How happened you to see them in Shiremanstown since that first visit of theirs?

A. The reason was, my house and shop stands about a half a square from the tavern where they would stop to get their meals when they would come there. I have seen them standing on the porch, and I could also see them from my shop door. I have seen them drive by frequently when I did not speak to them. At other times, I would speak to them and bid them the time of day. The reason was that Drawbaugh and I have been intimate since we were boys. We have been like brothers.

Q. Q. 43. Have you had any talk with them about talking-machines since that first visit?

A. I have spoke to Mr. Drawbaugh about it, yes, sir; several times—talking about the machine, and about the idea of vibration, and a certain remark he made to me in conversation. The remark was this. That he heard Mr. Samuel Hertzler's daughter play on the organ probably a quarter of a mile from his place of residence. While she was playing the organ, he took notice that there was a sound of a cut-off in that organ, just like a tap, tap, tap—a cut-off in that sound. Being anxious to know what caused it, he went to Samuel Hertzler's, and found a break in the window

EPHONE COMPANY,-1

glass. Being loose, it would jar. From that, he seen what the cause was of that there sound,– cutting off like. Then, he said that that showed him that he was right; that give him an idea that he was right in his study.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 24th day of May, 1881.
FRED. M. OTT,
Examiner.

PETER C. ZIMMERMAN.

WILLIAM H. BATES, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. Forty-eight; Mount Joy, Lancaster county; occupation, blacksmith.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Penna.? If so, how long have you known him?

A. I have known him about thirty-five years.

Q. 3. Were you in his shop at Eberly's Mills at any time during the summer of 1874?

A. Yes, sir.

Q. 4. When was the last time that you ever were in his shop at Eberly's Mills?

A. In the fall of 1877.

Q. 5. From the summer of 1874 to the fall of 1877, how many times were you in his shop, in all?

A. I was there eight or ten times.

Q. 6. Were those visits scattered along through all the time, from the summer of 1874 to the fall of 1877?

A. Yes, sir.

Q. 7. Did you see any talking-machines there at those visits?

A. Yes, sir.

Q. 8. Did you ever talk through any of them, or hear anybody talk through them?

A. No, sir.

Q. 9. When did you first see talking-machines there at his shop?

A. In 1874, in the fall.

Q. 10. Please look at the machines now shown you, marked from "A" to "O," inclusive, except "J," and state whether you recognize any of them as having been seen by you at Drawbaugh's shop during the years referred to.

A. This machine here—these three, [indicating "B," "F," and "C,"] I saw the first time I was there; but this machine, "C," is not all here. There was something more attached to it at that time. I recognize this, ["A,"] and that, ["D,"] and that, ["E."] This one ["H,"] I recognize, too. I would not be just positive as to the date when I saw it. I saw it there.

Q. 11. When Drawbaugh first showed you these machines "B" and "F," did he tell you what they were for?

A. Yes, sir.

Q. 12. What?

A. Talking-machine—to take the place of telegraphing.

Q. 13. Did he tell you how they were operated?

A. Yes, sir; by electricity.

Q. 14. Did he tell you how far he could talk through them from one place to another?

A. Yes, sir; he said they could be used the same as a telegraph wire for a distance.

Q. 15. Did he at that time, or any other time during those years, say anything to you about patenting the invention? If so, what?

A. He told me he would get it patented if he had the means, and he had asked several men to assist him, and they just laughed at him.

Q. 16. When did he tell you that?

A. He told me that in '74,—first time that he talked to me about the talking-machine.

Q. 17. State, as near as you can, about when it was that you first saw this machine "A."

A. I saw that machine in August, '75.

Q. 18. State, as near as you can, about when you first saw these machines "D" and "E."

A. I saw them also in August, '75.

Q. 19. State, as near as you can, about when you first saw this machine "H."

A. I can't positively state just the time. It was in the summer of 1876, to the best of my recollection.

Q. 20. Did you see the inside of it?

A. Yes, sir; he also had a battery connected to it.

Cross-examined by Mr. Smith:

Cross-Q. 21. Have you told us all that Drawbaugh said to you about these talking-machines during the whole time that you have mentioned?

A. We had general conversation about it at different periods during that time.

Cross-Q. 22. Did you talk with him about the machines every time you were at the shop?

A. Yes, sir.

Cross-Q. 23. Will you state anything else that he said to you at these various times, besides what you have already stated?

A. It would be hard to tell what we talked about, every time I was there. His general conversation was about talking-machines. Several times that I was there his mind seemed to be taken up with it. He said he would like to get it patented, but he had not the means to do it. He said he could make a fortune out of it.

Cross-Q. 24. And did he tell you this a number of times?

A. Yes, sir; we were very intimate friends, and I went to see him pretty often, and we exchanged opinions about mechanism.

Cross-Q. 25. When he showed you the instrument marked "H," what did he say about it?

A. He said it was a talking-machine, worked by electricity.

Cross-Q. 26. Was that all he said about it?

A. He showed me how it worked—charged like a battery. It had a battery connected with it—charged with electricity—worked by a battery—that he could communicate sound with it, from one point to another.

Cross-Q. 27. Was that all he said about it?

A. That is about as much as I know that he said about it. It takes a good memory to connect a whole hour's conversation. It was the principal point, anyhow, that was talked of.

Cross-Q. 28. How many times did you see that instrument at his shop?

A. I may have saw it three or four times. I was there about that many times from the fall of 1876 to the fall of 1877.

Cross-Q. 29. What did he say to you about that instrument or about any of the other instruments, at any of those three or four interviews after the fall of 1876?

A. He told me it would take the place of telegraphing, and remark-

AMERICAN BELL TELEP

ed that if he had money enough to get it patented, he would be well fixed.

Cross-Q. 30. What did you say to him when he told you that?

A. I told him it was a grand pity he had not the money to get it patented.

Cross-Q. 31. When he first showed you the instruments "A," "D," and "E," what did he say to you about them, or either of them?

A. He told me he thought he had the talking-machine completed.

Cross-Q. 32. Was that all that he told you at that time?

A. That is about the sum and substance of it.

Cross-Q. 33. Did he say anything then about getting it patented?

A. I think the first time we ever spoke together about the talking-machine, he wished he had money enough to take out a *caveat* for a patent. I think that was when I first saw that machine, [indicating "C,"] when he first commenced to work on it. When he showed me the machines "A," "D," and "E," he said he thought he had the talking-machine perfected. That was after he showed me the machines "B," "F," and "C."

Cross-Q. 34. At the time when he showed you the machines "A," "D," and "E," did he say anything about getting them patented?

A. Yes, sir; he said he would get them patented if he had money enough to do it, but he had not the money. I knowed he was very poor at that time, too.

Cross-Q. 35. How many times did you see the machines "A," "D," and "E" at his shop after the first time?

A. I may have probably seen them a half a dozen times.

Cross-Q. 36. After you first saw these machines in August, 1875, how many times were you at Drawbaugh's shop before the fall of 1876, when you first saw the machine "H?"

A. That I could not tell you exactly how many times. I went there very frequently.

Cross-Q. 37. Did you see the machines "A," and "D," and "E" at each of the times when you went to the shop in the fall of 1875, and in the winter, spring, and summer of 1876?

A. That I could not say positive. I know I was there some times that I was not upstairs where the machine was; that I had not the time. He had this talking-machine upstairs in a private office room that he had there, and very often I did not go in there.

Cross-Q. 38. Did you during that time, between the summer of 1875 and the fall of 1876, see these talking-machines a number of times?

A. I was there in August, 1875, and I know I was there in the winter for a certainty, because I had business there.

Cross-Q. 39. Did you see these machines during that time, after the first time that you saw them?

A. Yes, sir.

Cross-Q. 40. How many times?

A. That I would not be positive in telling. I could not say how many times.

Cross-Q. 41. Did you, at any of your interviews with him, after you first saw the machines "A," "D," and "E," and before you saw the instrument "H," have any conversations with him about the talking-machines?

A. Yes, sir.

Cross-Q. 42. What did he say at those interviews?

A. He was talking about getting the talking-machine patented. All that kept him from it was that he had not the means of getting it patented. That was his general conversation on all the interviews that we had about it.

Cross-Q. 43. Did you know of his doing any work on talking-machines after you first saw the machines "A," "D," and "E," and before you saw the machine "H"?

A. That I could not say. I was not about him when he was working.

Cross-Q. 44. Did you know of his doing any work on talking-machines after you saw the instrument "H"?

A. No, that I don't know. I have not been in his place since the fall of 1877. I moved to Lancaster county in the spring of 1878.

Cross-Q. 45. Did you know of his doing any work on talking-machines before you moved away, and after he showed you instrument "H"?

A. That I don't know.

Cross-Q. 46. Did you ever, at any time, ask him to let you see any of the instruments tried, or hear them talk?

A. No, sir; I did not ask him.

Cross-Q. 47. Did he ever offer to let you hear them or try them?

A. We talked something about it one day there; he had it in operation, he said. I did not get him to use it at all. What little time I had there, he showed me a clock he had hanging against the wall there, run by electricity. What time I had, then, was consumed and I had to leave.

Cross-Q. 48. When was that?

A. That was some time in 1875 or 1876. I would not be certain which it was.

Cross-Q. 49. In your answer to the thirty-third cross-interrogatory, referring to the instrument marked "C," you used the expression, "when he first commenced to work on it." Did you see him when he first commenced to work on it?

A. No, sir; my idea was given wrong. I meant the first time he called my attention to it. I did not see him work at it at all. He may have worked on it a year before, or two. He never called my attention to it 'till that time.

Cross-Q. 50. At the time when he first called your attention to that instrument, what did he say about it?

A. He told me he was working on a talking-machine.

Cross-Q. 51. Is that all that he told you about it?

A. No, sir; he told me it was to take the place of telegraphing. That was his first idea—the way he conveyed it to me.

Cross-Q. 52. At that time, did he say anything about patenting it?

A. Yes, sir.

Cross-Q. 53. What was it?

A. If he had money enough he would take out a *caveat*, but he was too poor.

Cross-Q. 54. Was that the first time that he ever said anything to you about a talking-machine?

A. That was the first time he called my attention to it.

Cross-Q. 55. Was that the first time when he first showed you the instruments "B" and "F?"

A. Yes, sir; but it is not all here—not all to this machine ["B,"] nor to this, ["C."] There was some kind of a thing that closed up this, [indicating end of tin tube of "B" next to electro-magnet,] and there was something here, [indicating the portion of the board of instrument "C," marked "X" now by the examiner,] but I don't know what it was.

Cross-Q. 56. Was the instrument "F" in the same condition then that it is now?

A. Yes, sir; I think it was.

Cross-Q 57. Where did you reside at that time?

A. Shiremanstown, Cumberland county.

Cross-Q. 58. How long had you resided there, and how long did you continue to reside there?

A. I was born there. Then I was in the army four years and three months. I was away from home then. After I came home, I worked in Pittsburgh for J. C. Biddle from 1865 to 1868. I moved back to Shiremanstown in the spring of 1868, and remained there 'till the spring of 1871. Then I moved to Cleveland, Ohio, in 1871. Was there till the fall of 1873, when I moved back to Shiremanstown, where I remained 'till the spring of 1878. I then moved to Mount Joy, where I reside yet.

Cross-Q. 59. Were you accustomed to visit Drawbaugh's shop, or to see him from the fall of 1873, when you moved back from Cleveland, until the fall of 1874?

A. No, sir; I was not in his shop.

Cross-Q. 60. Were you accustomed to go to his shop before you went to Cleveland?

A. Yes, sir; I worked for him. That was in the fall of 1868, after I came back from Pittsburgh; I made the tools for that Faucet Company.

Cross-Q. 61. How long did you work for him, or for that company, and how often did you go to his shop until you went to Cleveland?

A. I suppose it took me about four months until I got everything fixed up that they wanted. How often I was at the shop, I could not say. Sometimes I would be there twice a day. The blacksmith-shop was about one eighth of a mile from Drawbaugh's shop.

Cross-Q. 62. What led you to make repeated visits to Drawbaugh's shop during the three years from the fall of 1874?

A. I had work for him to do. He made me taps several times, and he turned off several pairs of small axles for baby-coaches that I made. I visited him several times on Sunday, and went down to his shop.

Cross-Q. 63. Were you accustomed to see other people there at these visits?

A. There was nobody there on Sunday when I was there. During the week when I was there, there was sometimes several men employed, but it was oftener that there was nobody there.

Cross-Q. 64. What business was carried on in that shop during that time?

A. They were making Kline's patent axle there in 1875 and 1876—somewhere along there—working on that.

Cross-Q 65. How do you fix on August, 1875, as the time when you first saw instruments "A," "D," and "E?"

A. I got a pair of small axles turned. I think it was between the

11th and 15th. I could have known for a certainty, if I had looked in my book before I left home.

Cross-Q. 66. Did not you have small axles turned more than once?

A. Twice.

Cross-Q. 67. What makes you name the fall of 1876 as the time when you first saw instrument "H?"

A. During the fall of the Centennial, Mr. Drawbaugh stopped at my shop in Shiremanstown, and looked at a patent blower that I had there in use. After he got through with that, he invited me to come to see him. I went down to the shop on Sunday,—two weeks, I think, afterwards,—and he showed me this talking-machine "H," this large one. That is the way I fix the time.

Cross-Q. 68. Was there anything said by him or you at the time of his visit to you, or of your visit to him two weeks later, about the Centennial, in connection with instrument "H," which leads you now to connect them?

A. No, sir.

Cross-Q. 69. Why, then, do you connect them?

A. Him and I was talking about the Centennial at the door of my shop. He asked me whether I had been at the Centennial, and I told him no. I showed him my blower, and he said he had a better one, and wanted me to bring my blower down and he would make an improvement on the one I had.

Cross-Q. 70. Whereabouts in the room, where you saw the talking-instruments, were they when you saw them?

A. I think, from the way the building stands, they were in the north-west corner, on a table, in a place fixed off in the corner. I think you would call it the north-west corner. On the west side of the room, he had on a table different models and patterns of different things. I did not inquire what they were particularly.

Cross-Q. 71. Whenever you went to that room, did you see the talking-instruments there?

A. Yes, sir.

Examination taken, reduced to
writing, and by the witness af-
firmed and subscribed to before
me, this 25th day of May, 1881.
FRED. M. OTT,
Examiner.

W. H. BATES.

PHONE COMPANY,-1

Adjourned until May 26th, at 10, A. M.

May 26, 1881.

Examination resumed, pursuant to adjournment.

Present, Mr. Smith for complainants, and Mr. Hill, Mr. Jacobs, and Mr. Abraham for respondents.

DANIEL RUPP, *being produced, affirmed, and examined, saith:*

Examined by Mr. Abraham:

Q. 1. State your age, residence, and occupation.

A. Forty eight years; Spring Garden, Lancaster county; coachmaker.

Q. 2. Are you acquainted with Daniel Drawbaugh, of Eberly's Mills? If so, how long have you known him?

A. About thirty years.

Q. 3. Have you visited his shop frequently during the last seven years?

A. Yes, sir.

Q. 4. During your visits there, has he ever shown to you any instruments which he called talking-machines?

A. Yes, sir.

Q. 5. When was the first time that he showed you his talking-machines?

A. In 1874.

Q. 6. What time of the year 1874?

A. June or July.

Q. 7. Is there any circumstance or event in your memory that enables you to fix the time as in June or July, 1874? If so, state it.

A. Yes, sir; I was building that summer. I went down to a quarry, close to his shop, to see about getting some stone.

Q. 8. When you went down to get the stone from that quarry, did you go into his shop,—and what did he show you that he called a talking-machine?

A. Yes, sir; I went into his shop. He showed me tumblers, he showed me wire covered over, and he showed me a machine for covering wires; he showed me magnets that he had up against a partition or on a shelf, and showed me something round, made out of walnut wood, that was attached to the wire, and he showed me a number of the same kind of concerns that he had in a case, different sizes of them. He then was going to talk to me over this wire, and could not. He said it was out of fix then.

Q. 9. Did you visit his shop during the year 1874, subsequent to the months of June and July?

A. Yes, sir.

Q. 10. About how often?

A. Twice, I think, after.

Q. 11. Did he again, at these subsequent visits, show you these instruments that he called talking-machines?

A. Once, afterwards. I was there once when the shop was shut—locked—and I could not get in.

Q. 12. Did you visit him subsequently to June and July, in that year, and get into his shop?

A. Yes, sir.

Q. 13. Did he then show you his instruments that he called talking-machines?

A. Yes, sir.

Q. 14-15. Please examine the various machines now spread before you on the table, and tell the examiner which, if any of them, you identify as having seen as Mr. Drawbaugh's shop at the visits concerning which you have testified.

[*The instruments on the table are marked "A," "B," "C," "D," "E," "F," "G," "K," "L," "M," "N," and "O."*]

A. This ["F"] was the one I remember. Something like this ["A"] was the one attached to the wire. This ["C"] is one that was on a shelf up against the partition. Now, there were some having a mouth-piece like that [taking up "O," and indicating its circular mouth piece] that were in the case. I saw some with curled irons on like that, [indicating the curled magnet on "D,"]—something of that shape, I can't tell whether these are the identical instruments or not. Then, there were some large—I think some larger than this ["K"] in that case.

Q. 16. You spoke of an instrument like "A" being attached to the end of the wire. Please explain what wire you refer to.

A. That is the wire that went through the partition and came down to the—there was a magnet on this here [indicating the part of machine "C" previously marked "X" by the examiner,] and from that it came down to the table—the wire did—where there were tumblers like this here ["F"] standing.

Q. 17. How many tumblers were there, to the best of your recollection?

A. Two.

Q. 18. Did they each have a wooden cap, like the one on the tumbler before you now?

A. No, sir.

Q. 19. Did you notice any material inside of either or both of them?

A. They were coated inside with something white.

Q. 20. Was the bottom out of both of them?

A. No, sir.

Q. 21. I understand you to say that at the first visit, in June or July, 1874, Mr. Drawbaugh endeavored to operate his talking-machines, but that he told you they were not in proper condition then. Did he operate them when you visited him the second time?

A. Yes; the first time I went there, (it was in June or July,) we went to his office or room that he had partitioned off from the other part of the shop. When we got to the door, he says he wants to show me his talking-machine, and he gave me an instrument in my hand, something much like this ["A"] and told me I should put it up to my ear. He then went into his room and shut the door, and he was going to talk to me, but said he could not, it was out of fix. Then I was there afterwards, and then he spoke to me through the machine.

Q. 22. When he spoke to you through the machine, where were you and where was he?

A. I was outside of that room, as near as I can recollect, about eight feet from the partition. He was about seven or eight feet from the partition, inside, as near as I can remember.

Q. 23. Did you understand, through the instrument that you held to your ear, what Mr. Drawbaugh said to you?

A. Yes, sir.

Q. 24. Did you repeat to him the language you heard through the machine?

A. Yes, sir.

Q. 25. And what did he reply?

A. He said it was correct.

Q. 26. Do you recollect any of the language or words that you heard through the machine that you were listening at?

A. Yes, sir.

Q. 27. What do you recollect?

A. He mentioned the names of some of the cities in Pennsylvania, with a sentence that he spoke.

Q. 28. What cities do you recollect?

A. He mentioned Philadelphia or Pittsburgh, or may have mentioned both of them.

Q. 29. Did you recognize the voice as that of Daniel Drawbaugh?

A. There was not any person in the shop but him and I.

Q. 30. Could you have heard him speak, and understood what he said, situated as you both were, with a closed partition between you, except through the instrument you held to your ear?

A. Not unless he had spoken very loud. I could tell that the sound came to my ear through the instrument.

Q. 31. You have stated that you remember having heard the names of certain cities distinctly. Did you hear other words and language which you cannot now call to memory equally as distinct?

A. Yes, sir.

Q. 32. What description of wire was used to connect these instruments?

A. Copper, covered with silk or cotton. I rather think it was silk that they were covered with.

Q. 33. Did Mr. Drawbaugh tell you the uses to which his talking-machine could be put?

A. Yes, sir.

Q. 34. What did he say in this respect?

A. That it would take the place of telegraphing. I laughed at him at the idea of that, and he said, "Rupp, you will see it will."

Q. 35. Did he state what distance he could talk through by means of his talking-machines?

A. No; there was nothing said about distance. If it would take the place of telegraphing, it would include most all distances.

Cross-examined by Mr. Smith:

Cross-Q. 36. You say you have visited Drawbaugh's shop frequently during the last seven years. Where have you resided during that time?

A. At Shiremanstown, Cumberland county, Pa.

Cross-Q. 37. How far from Drawbaugh's shop?

A. About three miles.

Cross-Q. 38. How long have you resided at Spring Garden?

A. Since the 30th of March, 1881.

Cross-Q. 39. Where did you reside for the five or six years previous to the summer of 1874?

A. At Shiremanstown.

Cross-Q. 40. Did you, during that time, occasionally or often, visit Drawbaugh's shop?

A. Yes, sir.

Cross-Q. 41. What led you to go to his shop during that time, or during the seven years following?

A. I had been interested in a patent mill-bush, and they were manufacturing them there at that shop. They also manufactured patent molasses faucets, and I still went there to see. The reason, it was under my charge, and I seen them work at these faucets. I used them also, in my business of storekeeping in my barrels of molasses; and these mill-bushes I had the oversight of, seeing after them and sending them out, and so on.

Cross-Q. 42. During what years was this manufacture of the mill-bushes carried on in Drawbaugh's shop?

A. I think it was 1866 and 1867. If I had thought of it and looked at my books, I could have told exactly.

Cross-Q. 43. During what years was the manufacture of faucets carried on in that shop?

A. Those same years up until now. The last visit I paid there they were still working at them.

Cross-Q. 44. When was the last visit?

A. I think it was the commencement of last July, I was there last.

Cross-Q. 45. Has the manufacture of faucets been carried on during all the years from 1866 and 1867 to that time?

A. No, sir.

Cross-Q. 46. During what years, then, was that manufacture carried on?

A. There was one year that Mr. Drawbaugh lived at Mechanicsburg. That year there was no faucets manufactured, that I can remember. Some years there was very few manufactured. He was improving on them, and sometimes they would only make a few of some improvement that he would make on them.

Cross-Q. 47 Aside from the year when Mr. Drawbaugh resided at Mechanicsburg, do you think the manufacture of faucets was carried on, to a greater or less extent, during all the time from 1866 and 1867, to the summer of 1880?

A. Yes, sir.

Cross-Q. 48. How many men do you think were at any time employed in that manufacture?

A. I think at one time they had about eight men employed.

Cross-Q. 49. When was that?

A. I think that was in 1866 or 1867,—somewhere along there.

Cross-Q. 50. How many men do you think were employed there in that business during 1869, 1870, and 1871?

A. I think sometimes there were three in the shop, sometimes two, and sometimes only one.

Cross-Q. 51. Take the three following years, 1872–'3 and '4. How many were there?

A. Well, about the same way. Sometimes they had one man there, which was Mr. Drawbaugh; sometimes him and his brother; and sometimes they had one man there besides those two.

Cross-Q. 52. Do you remember what year it was that he lived at Mechanicsburg?

A. No, sir.

Cross-Q. 53. After he came back from Mechanicsburg, how many men were employed in the faucet business, during the next two or three years?

A. Last summer I think they had two men employed part of the time, besides Mr. Drawbaugh; and the summer previous, his brother was working in there.

Cross-Q. 54. What occasion had you to go to his shop frequently, during the last seven years?

A. Sometimes on business; sometimes out of curiosity to see what he was working at.

Cross-Q. 55. What did you see him working at during those years?

A. Sometimes he was making drafts; sometimes he was working on faucet patterns; sometimes at clocks.

Cross-Q. 56. At any of the visits after 1874, did you see any of his talking-machines?

A. Yes, sir.

Cross-Q. 57. When was that?

A. When I went there still to the shop, he would show me all that he had been working at, and improvements that he had been making.

Cross-Q. 58. What talking-machines did he show you during any of the years after 1874?

A. I don't remember any that he particularly showed me—any talking-machine. I was more interested in his clock that he was then making.

Cross-Q. 59. You saw talking-machines after 1874. What ones did you see during the years after 1874?

A. It was something about like what he had showed me before. I don't know that I paid any particular attention to it after that year.

Cross-Q. 60. Where in the shop did you see them, when you did see them?

A. I think it was the east corner, where he had his room, on the second floor.

Cross-Q. 61. In the same room where you first saw them?

A. I think so.

Cross-Q. 62. Did he say anything to you about them during the years after 1874?

A. No conversation that I can recall to remembrance. I generally was hurried somewhat, and we would talk over a number of things,—but there is nothing about those talking-machines that I can distinctly remember.

Cross-Q. 63. Have you told us all that he said to you about them at the first two times that he showed them to you?

A. No, sir.

Cross-Q. 64. What else did he say about them?

A. I urged him to get it patented. He said that he had not it completed yet, or in shape to get patented. That he wanted to make some improvements on it.

Cross-Q. 65. Did you ever, after that, say anything to him about getting it patented, or about his getting it in shape to get it patented?

A. I think I did.

Cross-Q. 66. When was that, and what did you say to him?

A. I can't tell the year when it was, but I urged him still to get it patented, and his plea was poverty, afterwards.

Cross-Q. 67. Did you ever talk with him about getting it patented more than once after you saw the instruments?

A. I can't tell how often I have talked to him about it. I spoke to him several times about getting it patented, but the number of times, I could not say how often.

Cross-Q. 68. At any of the times when you met him, after the first two times, when you saw the instruments, did you make any inquiries of him about the improvements on it, or say anything to him about the improvements?

A. I don't remember that we had any particular conversations about the improvements after those two first times.

Cross-Q. 69. Why were you more interested in the clock, that he was making after 1874, than you were in his talking-machines?

A. I had some notion of taking an interest in that clock.

Cross-Q. 70. In what years was that?

A. I don't know that I can give you the exact date. I think it was in 1878 or in 1879. It may probably have been earlier than that.

Cross-Q. 71. Did you talk with him about taking an interest in it? If so, in what way did you propose to become interested?

A. No, sir; I never said nothing to Mr. Drawbaugh about taking an interest in it.

Cross-Q. 72. Did you have any talk with any persons about taking an interest in it?

A. No, sir.

Cross-Q. 73. Why did you think of taking an interest in the clock rather than in the talking-machine?

A. I did not think it would take as much money to go into that as it would to go into the others.

Cross-Q. 74. Did you, at any time, talk to him about taking out a patent or patents on his clock?

A. I think I did.

Cross-Q. 75. When was that, and what did you say to him?

A. I can't tell what date that was. I can't call to remembrance the conversation, but I remember speaking to him something about getting the clock patented.

Cross-Q. 76. When he talked to you through the talking-machine, what instrument did he use?

A. Some of these [taking up "F" in his hand] was what he was showing me, and what he used. These—the door was shut and I could not see what he held in his hand, but the wires were connected from where I was, and I suppose that is what he used.

Cross-Q. 77. What instruments were the wires connected to in the room where he was?

A. There was a machine something of this kind [taking up "A,"] where there was one end of the wire fast, and then there was an end of

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the wire fast to some of those tumblers that he had standing on a table there.

Cross-Q. 78. Was the wire connected to any other instrument beside those you have named at the time he was speaking to you?

A. It appears to me there was a machine with a bell on, that they were attached to. I don't remember whether that was the first time I was in there or the second time.

Cross-Q. 79. You mean the second time when you saw the talking-machines?

A. Yes, sir.

Cross-Q. 80. Will you look at the instrument with a bell on it, marked "H," and state whether that is the instrument, or like the instrument with a bell on it, that you saw connected to the wires at either the first or second time that you saw the talking-machines?

A. I don't know whether that is the instrument. I seen an instrument in his shop there, but whether it was the first or second time, I could not tell. It was an instrument something like that. I can't tell what time it was that I saw it.

Cross-Q. 81. Did Mr. Drawbaugh open the instrument and show you what was inside?

A. Not that I remember.

Cross-Q. 82. What business were you engaged in in 1874, and from that time down to the present time?

A. Coach-making.

Cross-Q. 83. Before that time what was your business?

A. I was raised on a farm and worked on that 'till I was nearly sixteen years old. Then I was nearly five years on the railroad. Then I worked on the farm awhile again. Then I went to store-keeping in 1856, and remained at that business till the spring of 1874. I was also engaged in brick-burning, awhile. I commenced coach-making, the spring of 1869.

Cross-Q. 84. Had you any interest or connection with the faucet business that was carried on at Drawbaugh's shop, except that you purchased faucets?

A. No, sir.

Cross-Q. 85. Have you, at any time before this, made an affidavit in relation to Drawbaugh's talking-machine?

A. Yes, sir.

Cross-Q. 86. When did you make it and who was present when you made it?

A. I think it was in the fall of 1880, or early in the winter. Mr. Jacobs, Mr. Drawbaugh, and a Justice of the Peace—I don't remember his name—were present.

Cross-Q. 87. Do you know that the telephone is in use in Harrisburg and other places at the present time?

A. Yes, sir; I know they are in use in Harrisburg, here.

Cross-Q. 88. When did you first know of their use in Harrisburg here, either by seeing them or by hearing or reading about them?

A. As near as I can remember, I think it was about a year ago. Probably a little longer than that.

Cross-Q. 89. Had you ever, before you knew of their use here, known, or heard, or read of their use in other places?

A. Yes, sir.

Cross-Q. 90. How long before, should you think?

[*Question objected to, as well as all preceding questions and answers in reference to the use of the telephone, as not proper cross-examination and as hearsay evidence.*]

A. I think about two years ago.

Cross-Q. 91. Do you remember how you first learned about them?

[*Same objection.*]

A. From the papers.

Cross-Q. 92. What papers?

[*Same objection, and that it is improper and incompetent to prove the contents of a newspaper by the witness's memory.*]

A. I can't tell you in what paper I saw it first. I have been getting a number of papers.

Cross-Q. 93. Did you ever see anything about the telephone in the Harrisburg papers?

[*Same objection.*]

A. Yes, sir.

Cross-Q. 94. In what other papers have you seen anything about it?

[*Same objection.*]

A. I think I saw it in the *Messiah's Herald*, published in Boston.

Cross-Q. 95. How long ago was that?

A. I really can't tell definitely. I think something about like two years ago.

Cross-Q. 96. Have you been in the habit of reading the Harrisburg papers, or any of them, for the last four or five years?

A. Yes, sir.

Cross-Q. 97. Which ones?

A. I have been a reader of the *Telegraph*, I don't know how long, though. I don't know whether it is four years yet or not. Occasionally, I would read an *Independent* or a *Patriot*, but the *Telegraph* was the paper that I read nearly every day when I was home. I have read the *Messiah's Herald*, of Boston, for about twenty-five years.

Recess for dinner until 2.30, P. M.

May 26, 1881, 3, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Re-direct examination of Mr. Rupp by Mr. Abraham:

Q. Q. 98. Do you recollect where and when you first saw a telephone in public use?

A. Yes, sir.

Q. Q. 99. Where was it, and when?

A. At Philadelphia, at No. 945 Ridge avenue, I think,—just about two years ago, now.

Q. Q. 100. Who showed it to you?

A. Mr. Middleton.

Q. Q. 101. Now state the circumstance, and what was said in reference to it.

A. I was sitting in the office talking with Mr. Middleton. There was a gentleman came in, and asked them the price about iron pipe, I think, if I am not wrong. He said he would have to ask a party down Third street. He told me then he wanted to talk with that party a little, and then I asked him why—how he would do that. Then he said I should come into their private office, where they had this telephone. Then I asked him if he had the Drawbaugh machine. He said, "No, sir." He told me the name of the machine, but I don't recollect what that was any more. Then, after we came out again, I got talking to him about this Drawbaugh machine. I can't remember our conversation about it, any more.

Q. Q. 102. Did you listen at the telephone in Mr. Middleton's establishment?

A. Yes, sir.

Q. Q. 103. And did you recognize the character of the sound that came through it as in any way peculiar?

A. Yes, sir; like the sound that I heard through Drawbaugh's machine.

Q. Q. 104. In reply to your cross-question sixty-four, you stated that you had urged Mr. Drawbaugh to get his machine patented, and that he had not then it in shape to have it patented, and that he wanted to make some improvements on it, and afterwards, when further cross-examined, you testified that when you urged him at other times to get it patented, he put in a plea of poverty. Please state, as near as your recollection serves you, how many times you spoke to him about getting it patented and how often he plead poverty.

A. I could not state how often I spoke to him. I might have spoke three or four times, or a half dozen of times. I know he plead poverty several times that I spoke to him about it, after that first conversation, when he said he did not have it in shape yet.

Q. Q. 105. You have stated that you made several visits to Mr. Drawbaugh at his shop after June and July, 1874. What, in these subsequent visits, if anything, did Mr. Drawbaugh say in reference to improvements he was making in his talking-machine?

A. He told me several times that he was working at it.

Re-cross by Mr. Smith:

Re-cross-Q. 106. What is Mr. Middleton's full name, and what business was carried on at the place where you saw the telephone in operation in Philadelphia?

A. The one that I was talking with is, H. W. Middleton. They are iron merchants.

Re-cross-Q. 107. Who else was present when you were talking about the telephone?

A. In the private office, there was no one but Mr. Middleton and myself. In the other room, there was the clerk, behind the desk. Mr. Bell, I think, was his name.

Re-cross-Q. 108. After you came home, did you, at any time, have any talk with Mr. Drawbaugh about what you had seen in Philadelphia?

A. Not that I remember.

PHONE COMPANY,-1

Re-cross-Q. 109. In your answer to the one hundred and fifth interrogatory, relating to talks with him about improvements on his talking-machine, you say, "he told me several times that he was working at it." How many times do you think he told you that, and when did the conversation take place?

A. He may have told me two or a half dozen times. I could not tell the number of times. Some time between 1874 and 1878. I could not fix the time precisely. I usually went there in the summer time.

Re-re-direct by Mr. Abraham:

Q. Q. Q. 110. Do you mean to say, then, that the conversations in regard to improvements were on divers occasions, extending from the year 1874 to 1878?

A. Yes, sir.

Examination taken, reduced to
writing, and by the witness affirmed
and subscribed to before me, this
26th day of May, 1881.
FRED. M. OTT,
Examiner.

DANIEL RUPP.

WILLIAM S. DELLINGER, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. I am thirty-four years old; residence, York, Pa.; I am a Miller by occupation, but am not working at it at present. I am carpentering.

Q. 2. Did you formerly reside at Eberly's Mills, Cumberland county, Penna.? If so, from what time to what time?

A. From March 1, 1876, to April 4, 1881.

Q. 3. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Penna.? If so, how long have you known him?

A. I have known him since the first of March, 1876,—a little better than five years.

Q. 4. Did you ever see any talking-machines at his shop while you lived at Eberly's Mills?

A. Yes, sir.

Q. 5. Please state the time when you first saw talking machines at his shop.

A. Some time—I can't just say the exact time—in March, 1876.

Q. 6. How came you to go to his shop at that time?

A. Jeremiah Fry asked me to go along down to see some of the machineries that Mr. Drawbaugh was making. We went down together.

Q. 7. In what part of the shop did you see the talking-machines at that time?

A. It was in the first room that you entered, after going up-stairs.

Q. 8. The stairs,—outside of the building now,—only run up to the top of the basement, so that you enter on the first floor over the basement, or cellar. How were they arranged in 1876?

A. They run up to the second story, so that I entered on the second floor.

Q. 9. How frequently were you in Mr. Drawbaugh's shop from March, 1876, to April, 1881?

A. I have been there very often. Sometimes as high as twice a day.

Q. 10. Did you ever see any talking-machines there after March, 1876? If so, how often?

A. Yes, sir; I could not just say how often.

Q. 11. Give us as near a correct idea of it as you can.

A. Really, I could not state how often. I might possibly have seen it a hundred times.

Q. 12. Did you ever talk through it, and hear others talking through it?

A. Yes, sir.

Q. 13. Please look at the machines now shown you, marked from "A" to "O" inclusive, and see if you recognize any of them as the machines you saw in Drawbaugh's shop in March, 1876. If so, please point them out.

A. This is the one I first saw [taking up "E.] This was the next one that I saw in March, 1876, [indicating "B."] This I saw afterwards,—I can't just say exactly what month [indicating "A."] The fourth one was this [indicating "C."]

Q. 14. Did you first see the machines "E" and "B" at the same visit?

A. Yes, sir; at the same visit.

Q. 15. But saw "E" before you saw "B?"

A. Yes, sir.

Q. 16. Please look at this machine "H," and state whether you ever saw that at Mr. Drawbaugh's shop.

A. The one that I saw, I thought that it was square. It was not sloped off, but had a bell on it. It looked like this inside [looking at the inside arrangements of "H."]

Q. 17. Where was that machine that you saw that looked like this machine "H?"

A. It was in the next room to the left as I came in. It was either screwed or nailed on to the door of a closet, to the best of my knowledge.

Q. 18. About how long ago was it that you first saw the machine like "H," to the best of your recollection?

A. About two years, or a little better.

Q. 19. Before or after the Clock Company commenced operations there?

A. After the clock manufacture was going on.

Q. 20. Before or after the Clock Company stopped operations?

A. About the time the Clock Company was going on, I saw it first.

Q. 21. Did you ever see these machines there, marked "G" and "O?"

A. Yes, sir.

Q. 22. About what time did you first see them, to the best of your recollection?

A. I can't fix the date definitely. It was in the year 1877.

Q. 23. Did you ever talk through this machine "H," or hear any one talk through it, there at the shop?

A. Not this one; it was one as big as this,—I thought it was square. It looked like this.

Q. 24. I mean, did you talk through, or hear any one talk through, the machine that was fastened to the cupboard door, as you have testified?

A. Yes, sir; I heard Mr. Drawbaugh talk through.

Q. 25. Where were you when he was talking through it? In what part of the building were you?

A. I was down-stairs, at the receiver.

Q. 26. What kind of a receiver did you have down-stairs at that time—any one of these machines on the table?

A. I don't remember what kind of a one it was, any more. I could not say exactly, something like this ["N"] in shape and size.

Q. 27. Was it connected with the machine that was attached to the cupboard door, and if so, how?

A. It was connected by two wires. I can't exactly say where the wires were on—at what points they were attached to the instruments, I mean.

Q. 28. When Mr. Drawbaugh talked into the machine up-stairs, and you listened at the receiver down-stairs, did you distinctly hear and understand what he said through the machines?

A. Yes, sir.

Q. 29. When you were operating those two machines, did you ever change positions,—Drawbaugh going down-stairs, and you taking your position upstairs, at the machine attached to the cupboard door?

A. Yes, sir.

Q. 30. What was done then?

A. I talked then, and Drawbaugh was at the receiver.

Q. 31. Give us an idea of how many times you and Drawbaugh operated that machine attached to the cupboard door, and its receiver, in the ways you have mentioned.

A. I could not say how often; probably a half a dozen times.

Q. 32. Was it on different days, or not?

A. Yes, sir.

Q. 33. During the time that the Clock Company,—composed of Mr. Shettel and the Grissingers,—was in operation there at the shop, did you see Mr. Drawbaugh doing anything with his talking-machines, or not?

A. Yes, sir; he was working on them after night.

Q. 34. How frequently were you there after night, when Drawbaugh was working at his talking machines?

A. I was there pretty often till nine or ten o'clock.

Q. 35. How late was he in the habit of working at his shop at nights?

A. I have seen him come home at eleven and twelve o'clock at night.

Q. 36. How late have you seen his light in the shop at nights?

A. I have seen it as late as twelve o'clock.

Q. 37. How happened you to be up at that time of night?

A. I woke up generally about midnight, as I had occasion to.

Q. 38. Do you recollect seeing this machine "J" there at the shop at any time?

A. I don't remember of it. The one I saw, this mouth-piece was larger, I think, and had a bell on top. It was not the machine attached to the cupboard door that I refer to.

Q. 39. How did its size and shape compare with the machine "J?"

A. It was shaped like this, and its size was like it, only there was a bell on top.

Q. 40. Did anybody talk through it?

A. No, sir.

Q. 41. How many times do you think you were in Mr. Drawbaugh's shop during the year 1876?

A. I could not tell.

Q. 42. A great many times, or only a few times?

A. Pretty often.

Q. 43. During the year 1877, were you in Mr. Drawbaugh's shop a great many times, or only a few times?

A. Pretty often.

Q. 44. During the years 1876, 1877, 1878, and 1879, as you would be in Mr. Drawbaugh's shop from time to time, what would he generally be working at?

A. Experimenting on clocks and telephones

Q. 45. During all the years that you lived there at Eberly's Mills, what invention was Mr. Drawbaugh spending the most of his time and labor upon, so far as you have opportunity for observation?

A. The most was on the telephone. His whole heart and desire was on the telephone.

Q. 46. Did you talk with him about it a good deal during those years?

A. Yes, sir.

Q. 47. Did he ever say anything about patenting it? If so, when did you first hear him speak of that?

A. Not to my recollection.

Q. 48. Did he ever say anything in regard to his financial means, or want of means, in connection with the telephone or talking-machine?

A. He did not, to my recollection, in regard to the telephone. He always pleaded poverty to me, when I asked him for money. I sometimes asked him for fifty cents, and he said he could not give me ten.

Q. 49. Did you ever see the machine "F?"

A. I have no recollection of that.

Q. 50. Have you any recollection of the machine "B" being used at any time while you were there?

A. I have no recollection.

Q. 51. State whether Mr. Drawbaugh ever told you that he had perfected his talking-machine invention. If so, when first?

A. I don't recollect anything of it.

Q. 52. How many different talking-machines or instruments did you ever see at Mr. Drawbaugh's shop, in all the years 1876, 1877, 1878, and 1879? If you can't give the number exactly, give us an idea of it.

A. Indeed, I could not say how many.

Q. 53. You have testified that you saw instruments "E," "B," "A," "C," "G," and "O;" also an instrument about the size of "H," with a bell on top; also an instrument about the size of "J," with a bell on top; also a receiver, that was used down-stairs, about the size and shape of "N." Did you see any others there, that you cannot identify, or not?

A. Yes, sir.

Q. 54. Did Mr. Drawbaugh ever tell you how far he could talk through these machines from one place to another?

A. I have no recollection.

Q. 55. Did he ever tell you how they were operated—on what principle they worked?

A. He told me, but I could not remember.

Q. 56. Did he tell you whether they were operated by electricity, or not?

A. I don't remember.

Cross-examined by Mr. Smith:

Cross-Q. 57. You have spoken about Mr. Drawbaugh being engaged on clocks and telephones during the years you were there. Do you know of his doing anything on faucets during those years?

A. Yes, sir.

Cross-Q. 58. In what years was he at work on faucets?

A. I could not just exactly say. It was 1878 and 1879, to the best of my knowledge.

Cross-Q. 59. In what year did the Clock Company carry on its business?

A. I could not just exactly say.

Cross Q. 60. I noticed that you used the word "telephone" in speaking of what Drawbaugh did. Did you and Mr. Drawbaugh use that word, during the years you were there, while talking about his instruments?

A. In the beginning, we used the word "talking-machine," afterwards, "telephone."

Cross-Q. 61. Can you tell about when it was that you began to use the word telephone?

A. I could not.

Cross-Q. 62. I suppose you did not know, during any of those years, that telephones were in use in Harrisburg, and in other places, did you?

A. Within the last two years or two years and a half, I have heard and read about these telephones.

Cross-Q. 63. Did you know of their being in use in Harrisburg at any time?

A. Not 'till lately. About February last, I saw the first in Gross's drug-store. I saw one in P. A. & S. Small's store, in York, afterwards.

Cross-Q. 64. From whom did you first hear about telephones other than those of Mr. Drawbaugh, or where did you first read about them?

A. I can't remember from whom. If I mistake not, I first read of them in the Harrisburg *Patriot.*

Cross-Q. 65. Do you remember what the paper said about them?

A. I don't remember, but I know it was the Bell telephone, mentioned in the paper.

Cross-Q. 66. Do you remember about how long ago that was?

A. Indeed, I don't remember. It is probably two years, maybe a little more.

Cross-Q. 67. Do you remember anything that was said about it?

A. While I think about it, I remember it stated that the Bell telephone is better than Edison's.

Cross-Q. 68. Before that time, as I understand you, you had not heard anybody say anything about any other telephone than Drawbaugh's.

A. No, I had not.

Cross-Q. 69. Were you in the habit of reading the Harrisburg *Patriot*, or any other Harrisburg papers, during the time that you lived at Eberly's Mills?

A. Not very often.

Cross-Q. 70 And did you read any paper constantly during that time?

A. Yes, sir; the York *Daily*; also, the *American Volunteer* of Carlisle.

Cross-Q. 71. When you read the article in the *Patriot* about the telephone, did you talk with Mr. Drawbaugh about it?

A. I don't remember that I did.

Cross-Q. 72. Did you ever talk with him about anything that you read in the papers about the telephone?

A. I have no recollection.

Adjourned until 9.30, A. M., May 27, 1881.

May 27, 1881.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Examination of Mr. Dellinger continued:

Cross-Q. 73. You speak of asking Mr. Drawbaugh for money; what occasion did you have to ask him for money, and how often did you ask him for it?

A. I needed the money. I asked him pretty often. He owed me for flour and feed, and also for rent.

Cross-Q. 74. Do you remember how large your bill for flour and feed against him was at any time?

A. For flour and feed, I remember it was as high as forty-five and fifty dollars.

Cross-Q. 75. Did you own the building where his shop was?

A. No, sir.

Cross-Q. 76. What did he owe you rent for?

A. The house he lived in.

Cross-Q. 77. How much rent did he pay you a year?

A. The last year he paid me forty dollars. He paid me, I think, all along, forty dollars while he lived in my house, except the last year, 1880, he paid fifty dollars to the assignee.

Cross-Q. 78. How many years did he live in your house?

A. It was in the estate a year, that is, through 1880. For three years I collected the rent. The fourth year, which was 1880, the assignee collected it.

Cross-Q. 79. You used to meet him frequently, I suppose, not only at his shop, but at his house and other places?

A. Yes, sir.

Cross-Q. 80. Did he use to come to your mill-office frequently?

A. Sometimes.

Cross-Q. 81. Do you remember his getting up a model for the patent on his faucet, some time in the year 1878 or 1879?

A. I remember of him getting up a model, but could not exactly say what year, unless I would refer to my book-entry.

Cross-Q. 82. What occasion had you to make any book-entry about that model?

A. He got flour along at that time.

Cross-Q. 83. Did not he get flour during all the time that you lived there?

A. Oh, yes.

Cross-Q. 84. What, then, would your book-entries tell you as to the time when he made the model?

A. He had worked there, in my mill-office, on this model, for a few days. For the reason was, he had no coal at his shop to keep warm.

Cross-Q. 85. Do your book-entries contain a record of the fact, that he worked on the model at your mill-office?

A. It don't just exactly say he worked on the model. I charged flour at that time that he was working on the model.

Cross-Q. 86. But you charged flour at a great many other times, did you not?

A. Yes, sir.

Cross-Q. 87. Do any of your book entries say anything at all about his working at your office?

A. It don't say that he was working there, but I can show by the book-entry that Drawbaugh was working on his model right after I had discharged my miller.

Cross-Q. 88. Does your book-entry state anywhere that Drawbaugh was working on his model at your office?

A. I have answered that before, that it don't exactly state that he was working on the faucet.

Cross-Q. 89 Does it state anything about his working there?

A. No more than the book-entries, by what I take it from, charging flour.

Cross-Q. 90. Now, will you state what your best recollection is, as to the year when he worked on the model at your office?

A. To the best of my knowledge, it was in 1878.

Cross-Q. 91. In the latter part of 1878, or the early part?

A. In the latter part.

Cross-Q. 92. You speak of an instrument having a bell on it, which was fastened to the door of a closet. Was that closet in a room on the same floor that Mr. Drawbaugh's office was on?

A. I don't know as he had, just exactly an office, but it was in the same room that he generally took parties in.

Cross-Q. 93. Was the instrument fastened to the outside of the door, or to the inside?

A. The outside.

Cross-Q. 94. So that anybody who went into his room could see the instrument when the door of the closet was shut, could they?

A. Yes, sir.

Cross-Q. 95. How long was that instrument fastened to the door in that way?

A. That I don't remember.

Cross-Q. 96. Did you see it there a good many times?

A. Pretty often.

Cross-Q. 97. You say, in answer to the 18th interrogatory, that, to the best of your recollection, you first saw that instrument about two years ago, or a little better. Now, as that is not a great while ago, and you saw it pretty often, won't you try to remember how long it remained fastened to the door?

[*Objected to, as the witness has already stated that he can not remember.*

A. I don't remember.

Cross-Q. 98. Do you remember seeing it after it was taken down from the door?

A. I don't remember.

Cross-Q. 99. Do you remember that it was taken down from the door, or remember of seeing the door without the instrument on it, at any time after you did see the instrument on it?

A. I have no recollection.

Cross-Q. 100. When you and Mr. Drawbaugh first talked about that instrument, what did he say to you about it?

A. I don't remember what he was talking about I can't remember what the words were any more. He used language, or words, that I did not know what they meant.

Cross-Q. 101. Did not you understand anything that he said about the instrument at the time that he first talked to you about it?

A. I could not say.

Cross-Q. 102. Do you remember the substance of anything that he said to you about that particular instrument, at any time? If so, please state it.

A. I don't remember.

Cross-Q. 103. If I understand you correctly, you first saw this instrument fastened to the closet-door before the Clock Company stopped its operations at that shop. Do I understand you correctly?

A. To the best of my knowledge.

Cross-Q. 104. You speak of talking through that instrument, or listening when Mr. Drawbaugh talked, probably half a dozen times. Can you tell me how long a period it was during which those half dozen trials were made?

A. I could not remember.

Cross-Q. 105. Can't you tell me whether they extended over a period of one month or a longer period?

A. I don't remember.

Cross-Q. 106. Do you remember how it was that Mr. Drawbaugh first came to show you the operation of that instrument?

A. He just took me in and showed me the telephone, and told me I should go down-stairs and listen what he says through this telephone.

Cross-Q. 107. Was that the first time you had seen that instrument?

A. To the best of my knowledge, it was.

Cross-Q. 108. How came he to show you the operation of the instrument at the several subsequent times?

A. That I don't remember.

Cross-Q. 109. At the several trials which you made of the instrument, did it operate just the same at one time as at the other times—that is, could you hear just as well what was said?

A. Could hear better the last; that is, I could understand better.

Cross-Q. 110. Did he say anything about having been improving the instrument or working on it in any way?

A. To the best of my knowledge, he did.

Cross-Q. 111. What did he say about it?

Cross-Q. 90. Now, will you state what your best recollection is, as to the year when he worked on the model at your office?

A. To the best of my knowledge, it was in 1878.

Cross-Q. 91. In the latter part of 1878, or the early part?

A. In the latter part.

Cross-Q. 92. You speak of an instrument having a bell on it, which was fastened to the door of a closet. Was that closet in a room on the same floor that Mr. Drawbaugh's office was on?

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A. The outside.

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A. Yes, sir.

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A. Pretty often.

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[*Objected to, as the witness has already stated that he can not remember.*

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A. I have no recollection.

Cross-Q. 100. When you and Mr. Drawbaugh first talked about that instrument, what did he say to you about it?

A. I don't remember what he was talking about I can't remember what the words were any more. He used language, or words, that I did not know what they meant.

Cross-Q. 101. Did not you understand anything that he said about the instrument at the time that he first talked to you about it?

A. I could not say.

Cross-Q. 102. Do you remember the substance of anything that he said to you about that particular instrument, at any time? If so, please state it.

A. I don't remember.

Cross-Q. 103. If I understand you correctly, you first saw this instrument fastened to the closet-door before the Clock Company stopped its operations at that shop. Do I understand you correctly?

A. To the best of my knowledge.

Cross-Q. 104. You speak of talking through that instrument, or listening when Mr. Drawbaugh talked, probably half a dozen times. Can you tell me how long a period it was during which those half dozen trials were made?

A. I could not remember.

Cross-Q. 105. Can't you tell me whether they extended over a period of one month or a longer period?

A. I don't remember.

Cross-Q. 106. Do you remember how it was that Mr. Drawbaugh first came to show you the operation of that instrument?

A. He just took me in and showed me the telephone, and told me I should go down-stairs and listen what he says through this telephone.

Cross-Q. 107. Was that the first time you had seen that instrument?

A. To the best of my knowledge, it was.

Cross-Q. 108. How came he to show you the operation of the instrument at the several subsequent times?

A. That I don't remember.

Cross-Q. 109. At the several trials which you made of the instrument, did it operate just the same at one time as at the other times—that is, could you hear just as well what was said?

A. Could hear better the last; that is, I could understand better.

Cross-Q. 110. Did he say anything about having been improving the instrument or working on it in any way?

A. To the best of my knowledge, he did.

Cross-Q. 111. What did he say about it?

A. I don't know as I can recall the words that he expressed.

Cross-Q. 112. State, as nearly as you can, the substance of what he said.

A. I don't remember.

Cross-Q. 113. Did you see the other instruments which you saw in the same room where the closet was?

A. No, sir.

Cross-Q. 114. In what room were they?

A. The first room I entered after I got up the stairway.

Cross-Q. 115. Whereabouts in the room were they?

A. To the right as I came in, on a bench.

Cross-Q. 116. What other machines or instruments did you see in that room, or in the room where the closet was?

A. I saw the clock, also the faucet.

Cross-Q. 117. In which room was the clock?

A. In the same room where the telephone was fastened to the closet-door.

Cross-Q. 118. Were there any workmen employed on the clocks or the faucets while you were in the habit of visiting Drawbaugh's shop?

A. Yes, sir.

Cross-Q. 119. In what room did they work?

A. The first room, or large room, rather. The first room that we entered on going up-stairs.

Cross-Q. 120. Who worked on the clocks, and who worked on the faucets?

A. George Drawbaugh worked on the clocks, and also Daniel Drawbaugh. J. B. Drawbaugh, Mr. Heiges, (I don't remember his first name, but think it was G. W. Heiges, if I mistake not,) George Rupley, and another whose name I can't recall, who lives in Harrisburg, worked on the faucet.

Cross-Q. 121. You speak of seeing another instrument with a bell on it, besides the one which was fastened to the closet-door. Did you first see that instrument before or after you first saw the instrument fastened to the closet-door?

A. That was afterwards.

Cross-Q. 122. What did Mr. Drawbaugh say to you about that instrument?

A. I don't remember what he said about it.

Cross-Q. 123. You say that you saw the instrument "G" and "O" in the year 1877. How do you fix the time when you first saw them as being in that year?

A. I know by my two brothers being to see me in that year.

Cross-Q. 124. How does the circumstance that your brothers came to see you in that year help to fix the time when you first saw these two instruments?

A. It was the first time they visited me.

Cross-Q. 125. What are the names of those two brothers, and where did they reside?

A. Henry and Michael. They lived in York county.

Cross-Q. 126. Did Mr. Drawbaugh say anything to you about these two instruments when you first saw them?

A. I don't recollect of him saying anything in particular with regard to these here [indicating "G" and "O."]

Cross-Q. 127. How many times did you see those instruments after the first time, and did Mr. Drawbaugh say anything to you about them at any time?

A. I don't remember how often I saw them. He said something to me about them, but I could not remember what.

Cross-Q. 128. Did you see them a good many times?

A. Pretty often.

Cross-Q. 129. Do you remember anything that he said to you about instrument "C" at any time?

A. I don't remember that he said anything about it.

Cross-Q. 130. How often did you see it?

A. Not very often.

Cross-Q. 131. How often did you see the instrument "A?"

A. I seen that very often.

Cross-Q. 132. What did Mr. Drawbaugh say to you about that instrument at the first time you saw it, or at any subsequent time?

A. I have no recollection what he said.

Cross-Q. 133. In your forty-fifth answer you say, "His whole heart and desire was on the telephone." What made you think his whole heart and desire was on the telephone?

A. Because he always talked to me about it, and experimented on it.

Cross-Q. 134. Were you with him when he was experimenting or working on the instruments?

A. I was in the shop.

Cross-Q. 135. Did you see him experimenting with them or working on them?

A. I seen him work on them.

Cross-Q. 136. What instruments did you see him work on?

A. I seen him work on wood-work and on these curled magnets [taking up "D;"] also, on these wires. He had a machine that he was working on that was putting thread or something on the wires. I don't know what it was.

Cross-Q. 137. When was it that you saw him working on the curled magnets?

A. That I am not able to say.

Cross-Q. 138. Can't you tell whether it was during the first year, 1876, or some of the later years?

A. I don't remember.

Cross-Q. 139. Do you remember what he was doing on the curled magnets?

A. He was working on them with a file, if I mistake not. He had a tool, anyhow, that he was working with.

Cross-Q. 140. Did you see what he did with them after he had done working on them?

A. He fitted them into the wooden boxes here on this pivot, [illustrating with machine "E."]

Cross-Q. 141. You say you saw him work on wood-work. What wood-work do you refer to?

A. I mean the wood-work on these telephones. I would not say it was on these. I know it was not on this one ["E,"] for this was the first one that I saw when I came in in 1876, and it was already made when I came there.

Cross-Q. 142. Do you remember his doing anything else on either of the instruments "D" and "E," except working on the curled magnets?

[*Objected to, as assuming that the witness has testified that Mr. Drawbaugh was working on the curled magnets of "D" and "E," whereas his testimony was only that he was working on curled magnets.*]

A. I don't remember.

Cross-Q. 143. When you say you saw him working on wood-work, do you mean that you saw him turning up round pieces of wood similar to the wood-work of "D" and "E"?

A. Yes, sir.

Cross-Q. 144. Did you see him doing that at many different times, or only once?

A. I did not see him do it very often.

Cross-Q. 145. You saw the instruments "D" and "E" a good many times, I suppose?

A. Yes, sir.

Cross-Q. 146. Did Mr. Drawbaugh ever say anything to you at any time about these particular instruments?

A. I can't remember, as I have already stated before.

Cross-Q. 147. You say that you think his whole heart and desire was on the telephone, because he always talked to you about it, and experimented with it. Can't you remember any particular thing that he said about the telephone which led you to think that his whole heart and desire was in it?

A. I don't remember no more than that he was always talking to me about it, and had worked on it after night, and it was always about telephones to me.

Cross-Q. 148. Did not he ever say anything to you about why he kept at work on it, and experimenting on it, and what he hoped to accomplish by his experiments?

A. He may have. I have no recollection of it.

Cross-Q. 149. In your direct examination, you stated that you had seen other instruments in Drawbaugh's shop besides those which you had especially designated, but that you could not recollect how many Can you tell me whether or not there were quite a number of them?

A. I could not say how many. There was not a great many.

Cross-Q. 150. Are you willing to give any estimate of the number?

A. I could not give an estimate.

Cross-Q. 151. Did you see Mr. Drawbaugh at any time doing anything on any instruments except working on the wood-work and on the curled magnets and wires?

A. Yes, sir.

Cross-Q. 152. What did you see him doing?

A. I seen him work on these kind of screws and brass pieces like that [indicating the milled screw and the brass bracket on the back of instrument "A."] I could not say that this is the one that I saw him working at.

Cross-Q. 153. Do you remember what he was doing on the brass bracket?

A. He was polishing it off with a little machine that had a leather pulley on. He used something to put on his leather pulley to polish it bright.

Cross-Q. 154. What did he do with the piece after he had got it polished?

A. I left the shop. Afterwards when I came down, he had it attached to a machine like the machine "A," to the best of my knowledge.

Cross-Q. 155. Did you ever see more than one machine at Drawbaugh's shop like machine "A"?

A. I don't remember that I did.

Cross-Q. 156. What did you see Mr. Drawbaugh doing on wires?

A. I seen him putting thread around it.

Cross-Q. 157. Did you ever see him at work making coils of covered wire similar to those on instrument "A" and in instruments "D" and "E"?

A. I seen him make these kind of wires, though I did not see him put them on this cylinder [indicating the electro-magnet in "E."]

Cross-Q. 158. Do you remember any other work that you saw Drawbaugh doing on telephones, except what you have spoken of?

A. Not that I remember.

Cross-Q. 159. You said you saw the work on the inside of the instrument attached to the closet-door. Do you remember seeing the inside of any of the other instruments which you have identified?

A. I saw the inside of this one ["E."] This is the first one I saw, and it was taken apart when I seen it. He had taken it apart to show it to Mr. Fry.

Cross-Q. 160. Do you remember when it was that you saw him at work on the curled magnets?

A. I don't remember.

Cross-Q. 161. You could not say whether it was in 1876, or in some following year, could you?

A. I could not say what year it was in—that is, between 1876 and 1881.

Cross-Q. 162. Could you give us any idea of when it was that you saw him at work on a brass bracket like that on instrument "A"?

A. I could not say exactly; I could not give no time how long.

Cross-Q. 163. When you saw instrument "E" open, the first time you saw it, were the parts apparently the same as they are now, in all respects?

A. I don't remember any more whether they were all the same or not.

Cross-Q. 164. Now, will you tell us, as nearly as you can, when it was that you saw Mr. Drawbaugh at work on the wood-work of instruments—turning them upon a lathe?

A. I could not tell.

Cross Q. 165. You could not tell whether it was in 1876, or in some of the years following that?

A. I could not tell the exact year.

Cross-Q. 166. Have you, at any time before this, given an affidavit with reference to Drawbaugh's telephones?

A. No, sir.

Recess for dinner until 2, P. M.

May 27, 1881, 2, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Re-direct by Mr. Hill:

Q. Q. 167. What was the name of your mill firm when you lived at Eberly's Mills?

A. Dellinger & May.

Q. Q. 168. What was its business?

A. Manufacturing flour, cornmeal, chops, etc., at the mill known as Eberly's mill.

Q. Q. 169. Did that firm fail in business? If so, when?

A. In 1879, it failed.

Q. Q. 170. You say Mr. Drawbaugh got flour all along during the time you were running the mill. What was his general condition, as to being able to pay for it, when he got it?

A. He always plead poverty, and we had to trust him along for the flour.

Q. Q. 171. You spoke of a talking-machine that you saw at Mr. Drawbaugh's shop attached to a closet-door. Do you recollect whether you saw that attached to the closet-door before or after Mr. Drawbaugh made the model of the faucet, in 1878?

A. Shortly before.

Q. Q. 172. Could you give us any idea how long before—whether it was a year before, or not?

A. I could not.

Q. Q. 173. Do you think you saw that instrument when it was first made, or might it have been at the shop some time before you first saw it? What do you think about that?

A. I don't know what to think about that Whether it was at the shop or not, I don't know.

Q. Q. 174. Was it in the same room where the workmen were working on the electric clocks?

A. No, sir.

Q. Q. 175. You are somewhat hard of hearing, are you not?

A. Yes, sir.

Q. Q. 176. How long has your hearing been defective?

A. It was either since 1857 or 1858.

Q. Q. 177. You say you recollect seeing the instruments "G" and "O" in 1877 because your brothers came to visit you that year. Was that the first time they had been there to visit you after you moved there?

A. Yes, sir.

Q. Q. 178. Did they both visit you at the same time?

A. Yes, sir.

Q. Q. 179. Did they see the instruments "G" and "O" while they were on that visit?

A. They saw these instruments "G" and "O."

Q. Q. 180. Where did they see them?

A. Down at Drawbaugh's shop.

Q. Q. 181. Were you there with your brothers when they saw "G" and "O?"

A. Yes, sir.

Q. Q. 182. I want to know whether you remember all the work that you saw Mr. Drawbaugh doing on telephones while you lived there, or whether you saw him doing other work on them which you are not now able to describe; what is the fact about that?

A. I don't remember.

Q. Q. 183. You stated, in your direct examination, that you had been at the shop, while you lived there, a great many times, and had seen talking-machines there possibly a hundred times. You have also stated that you frequently saw him at work on talking-machines, and that, during the years 1876, 1877, 1878, and 1879, he was generally experimenting on clocks and telephones, when you were there at the shop,

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and that more of his time and labor was spent on the telephone invention than on any other invention. In cross-examination, you state that you saw him turning the wooden boxes on a lathe, but not very often; that you saw him wrapping wire; also brightening up a brass bracket, also doing something to a screw. What I want to know is, whether the turning of the boxes, the wrapping of the wire, the rubbing of the brass plate, and the working on that screw took all those years, 1876, 1877, 1878, and 1879, or whether there was other work done, the nature of which you do not now particularly recall.

A. There was other work done on the faucets and clocks.

Q. Q. 184. Did you ever see him do any other work on telephones?

[*Objected to because the witness has already stated that there was work done on curled magnets.*]

A. I have already testified that I did not see all the work on telephones.

Q. Q. 185. Do you mean;—did not see all the work that he did on telephones in those years?

A. Yes, sir; that is what I mean.

Q. Q. 186. And do you remember everything that you did see him do on telephones in those years?

A. I don't remember everything.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 27th day of May, 1881.
FRED. M. OTT,
Examiner.

WILLIAM S. DELLINGER.

Adjourned until May 28th, 1881, at 9.30 o'clock, P. M.

May 28, 1881.

Examination resumed, pursuant to adjournment.

Present, Mr. Smith for complainants, and Mr. Hill, Mr. Jacobs, and Mr. Abraham for respondents.

HIERONYMUS GEISTWEIT, *being produced, affirmed, and examined, saith:*

Examined by Mr. Abraham:

Q. 1. State your age, residence, and occupation.

A. Fifty-five years old; residence, New Cumberland, Cumberland county, Pa. I have been working laboring work for the last few years; running an engine is my business, generally.

Q. 2. What business were you engaged in in the year 1870?

A. I was working at mill-wrighting then.

Q. 3. For whom and at what place?

A. I was working for Mr. Musser at New Cumberland. The works were just across the creek in York county, but I lived in New Cumberland.

Q. 4. When did you commence there? I mean the month.

A. I commenced in the month of July. I could not tell the day.

Q. 5. How long were you engaged as mill-wright for Mr. Musser?

A. After we got the mill done, I worked on the mill, I suppose a year and a half.

Q. 6. In what capacity were you working after the mill was done?

A. After we had the saws both put up, I run one of the saws, on until I quit.

Q. 7. How long were you running one of the saws?

A. I can hardly say exactly how long it took us to finish up the mill, but I think I run one of them a full year, anyhow.

Q. 8. When did you discontinue working at this mill?

A. I went there in 1870, and worked a year and a half there, and then went up to the steam-mill, and run the engine there for Mr. Lee and Bayler, on up to 1876. I then quit business and since then have been around at different things.

Q. 9. While you were engaged, during the year 1870, as before testified to, did you ever pay a visit to the shop of Daniel Drawbaugh, at Eberly's Mills?

A. Yes; in the year 1870, when I went to fix that mill, that was the first time that I ever saw that talking-machine.

Q. 10. Do you recollect what was the business that took you down to Mr. Drawbaugh's shop first in 1870? If so, state.

A. Yes, sir; I do, indeed. We had to have a tool that mechanics that travel out very seldom carry—a ratchet-drill. The shaft of the mill was an iron shaft, and we had to drill a hole in that. Finally, Mr. Musser sent it back by another man. I did not take it back.

Q. 11. How long have you known Daniel Drawbaugh?

A. I have known him ever since I have known anybody, I guess; we went to school together when we were little boys.

Q. 12. Do you recollect what time of the year 1870 it was that you went to borrow the ratchet-drill?

A. Yes, sir; it was in the month of July.

Q. 13. Did Drawbaugh then show you any instruments that he called talking machines?

A. He did, yes; when I went for that rachet-drill he showed me that machine.

Q. 14. Please examine the two instruments now shown you, and state when, if ever, you have seen them before.

A. I saw these two machines then when I went there [indicating "B" and "F."] He had these two in use then—these two by the wire.

Q. 15. Were they connected? If so, how?

A. This here one, ["F"] I think, he had on the inside of the building. The wire ran up along the building, and it ran out the opposite corner. This one [indicating "B"] he had on the outside—not outside of the building, but outside the office.

Q. 16. Did he tell you what they were for?

A. Yes, sir; he explained to me about his talking-machine that he was getting up. He had it up for some time then, but, of course, every day he was putting something to it, and wanted to find out how far he could talk with it—told me that he thought he could talk across the sea with it, just as well as not.

Q. 17. Did he operate his talking-machine while you were there in July, 1870?

A. Yes, sir; he did. He got me to go out of the room to the other end of the wire. I think that he talked into that glass there, [indicating "F,"] and I held my ear to this end of it [indicating end of "B" farthest from the electro magnet.] He spoke some few words, and then hollered out whether I heard it. I told him I did, quite plain and distinct.

Q. 18. Do you mean to say that you heard plain and distinct through the instrument?

A. Oh, yes; no doubt about that.

Q. 19. Did he then speak to you more through the instrument, after the first time, on that day?

A. No, sir; I don't think he did.

Q. 20. You have spoken of connecting wires. Will you please tell us, as nearly as you can, the course and direction of these wires that led from one instrument to another?

A. He had some quite small wires wrapped with colored thread. I could not say what use they were, but they were connected by a wire. I remember his telling me that he had not the wires lapped enough, that he intended to lap them more, that he could then talk through them still better. It was fastened up to the wall, like that, [indicating the wall of the room,] then along the ceiling, near to it, then turned the corner, above the door, and through the board partition until it reached this instrument ["B,"] fastened to the other end.

Q. 21. Do you recollect whether this glass part of "F" was lined or coated with anything?

A. Indeed, I could not say whether it was or not.

Q. 22. Please examine instrument "B," and state whether you remember that there were then any attachments to it that you do not see now.

A. No, I don't think there was, more than the wire is not to it now. I don't think he used either of them long on the wire. He got something better on the wire.

Q. 23. Did you visit Mr. Drawbaugh's shop after July, 1870?

A. Yes, sir; from that on to 1876. I was back and forward there several times; I could not tell how often.

Q. 24. What part of the year 1876 was it when you paid your last visit?

A. I don't know—towards fall, though.

Q. 25. Have you ever been there since the fall of 1876?

A. No, sir; I was not in Dan's shop since. I have been in Milltown a couple of times, but I was not in his shop.

Q. 26. Please examine these three instruments, "C," "D," and "E," and state whether you have ever seen those before at Mr. Drawbaugh's shop.

A. Yes, sir; I saw one of these, or one like them [handling "D" and "E."] I could not say which one, may be both; that is all I know.

Q. 27. Do you recognize any particular parts of those instruments "D" and "E"?

A. I don't know as I do, more than that he had one of those in use. If I had known that I was to come before a justice and take an oath, I would remember it more. I saw many things at his shop that I do not see on the table now.

Q. 28. After Mr. Drawbaugh had spoken to you through his talking-machine in July, 1870, did he operate his talking-machines in your presence?

A. No; I don't know that he ever talked to me through it, but he showed it to me after that.

Q. 29. What did he tell you about them afterwards, when he showed them to you?

A. He still said that he wanted to have it so that he could still talk to a further extent; that he had not as much room there as he wanted to stretch his wire, so he could not get to see how far he could talk. After he had taken that glass off, he put a box on it.

Q. 30. Please examine the instrument "H," and state whether you have ever seen that before. If so, where and when?

A. He had a box like that on his wire, but whether it was that one or not I would not be positive. He showed it to me one day when I drove up there one evening after quitting time, to have some little job done. This may be the very box, but I would not be positive. I did not examine it very close.

Q. 31. When you went there on this occasion that you referred to, he had taken away the glass tumbler and had substituted, in lieu thereof, this box machine "H," or one like it. Is that what you mean?

A. Yes, sir.

Cross-examined by Mr. Smith:

Cross-Q. 32. Whereabouts in the shop was the box machine with the bell on it when you saw it?

A. It was fastened up against the wall.

Cross-Q. 33. What did Mr. Drawbaugh say to you about it?

A. I don't know. He said it would make more of a sound of talking, by talking into a box, larger—something of that amount he talked to me about.

Cross-Q. 34. When you first saw the instrument "F," was it in the same condition as it is now?

A. I judge it was by the look of it. I can't see much difference, for my part, as far as I can see; of course, it has not the wires attached to it.

Cross-Q. 35. Where did you live in 1870?

A. I lived right in New Cumberland.

Cross-Q. 36. Have you lived there ever since?

A. Yes, sir.

Cross-Q. 37. How far is New Cumberland from Drawbaugh's shop?

A. Full two miles and a half.

[*Signature written by Examiner, by consent, owing to his hand being disabled.*]

Examination taken, reduced to writing, and by the witness affirmed to, and his signature subscribed by the examiner, as above stated.
FRED. M. OTT,
Examiner.

HIERONYMUS GEISTWEIT.

LEVI A. BOWEN, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. Age, forty-two; residence, New Cumberland; occupation, by trade, a blacksmith. At present I am working at the steel works, Steelton, Dauphin county.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Penna.? If so, how long have you known him.

A. Yes, sir; I have known him for about twenty-three years.

Q. 3. Did you ever see any talking-machines in his shop at Eberly's Mills? If so, when?

A. Yes, sir; I saw them about the latter part of September, 1878.

Q. 4. How do you fix the time when you saw them?

A. I went there to get a nurse. My child will be three years old, the 24th day of November. The nurse was to attend my wife during confinement, and I went there about eight weeks before her confinement.

Q. 5. Please look at the instruments marked "D" and "E," now shown you, and state whether you do or do not recognize them as the instruments that you saw at Mr. Drawbaugh's shop at that visit?

A. Yes, sir; I recognize these as the ones that I saw.

Q. 6. Did anybody talk through them while you were there?

A. No, sir.

Q. 7. Where did he keep them?

A. In a cupboard.

Q. 8. And took them out of a cupboard to show them to you?

A. Yes, sir.

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Q. 9. Did you see any other talking-machines there besides "D" and "E"?

A. No, sir.

Q. 10. What did Mr. Drawbaugh say about other talking-machines, if anything?

A. He said he had other ones.

Q. 11. Where was that cupboard from which he took out the talking-machines?

A. About the east corner of the building, as near as I can tell. I think it stands about east.

Q. 12. Was it in a small room partitioned off from the rest of the building?

A. Yes, sir; it was a room adjoining his work-shop.

Cross-examined by Mr. Smith:

Cross-Q. 13. What did Mr. Drawbaugh say to you about these instruments "D" and "E" when he showed them to you?

A. He said it was a talking machine, that he could convey sound any distance.

Cross-Q. 14. Is that all he said?

A. He said he could attach them to a telegraph wire and communicate with a person in Philadelphia, and would not interfere with the telegraphing.

Cross-Q. 15. Was that all that he said about them?

A. That is about all that I can remember.

Cross-Q. 16. What did he say about the other instruments which he said he had?

A. Nothing more than he said he had other ones.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 28th day of May, 1881.
FRED. M. OTT,
Examiner.

LEVI A. BOWEN.

Adjourned until Tuesday morning, May 31st, 1881, at 10, A. M.

Tuesday, May 31, 1881, 10, A. M.

Examination resumed, pursuant to adjournment.

Present, Mr. Storrow for complainants, and Mr. Hill and Mr. Jacobs for respondents.

WILLIAM D. SHOOP, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. I am in my sixty-seventh year; my birth-place and residence is near Shiremanstown, Cumberland county. I have been working for the last year at laboring principally.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Penna.? If so, how long have you known him?

A. Yes, sir; from the time that he was a boy. Yet I never was very intimate with him. His father and my father occupied a double house together, at one time, at Milltown.

Q. 3. Did you visit his shop at Eberly's Mills at one time in the year 1878? If so, at what time in said year?

A. Yes, sir; I visited it in 1878. It was about the 31st day of August, towards evening.

Q. 4. What did you find Mr. Daniel Drawbaugh at work upon, when you visited his shop, as above stated?

A. I think he was working at a clock.

Q. 5. Did you have any conversation with him about the clock?

A. Yes, sir; he told me that he had invented a clock that would go without weights. My impression is that he called it a magnetic clock.

Q. 6. While he was talking to you about his clocks, did he say anything about any other inventions of his? If so, what other invention?

A. Yes, sir; he told me that he had invented a talking-machine, which would far exceed the clock, and would supersede the telegraph; that, instead of operating with a telegraph key, you done it simply by talking from one to the other. I asked him how far he could talk, and he said distance made no difference.

Q. 7. Did he say anything about patenting the invention? If so, what?

A. Yes, sir; he said he was too poor to get it patented at that time, but as soon as he could get the means, he would have it patented.

[*Answer objected to as hearsay and incompetent.*]

Cross-examined by Mr. Storrow:

Cross-Q. 8. Have you told us all that passed between you on that occasion?

A. All he said about the invention, as near as I can remember.

Cross-Q. 9. Are you sure that nothing else passed between you about talking-machines?

A. No; not that I recollect of at the present.

Cross-Q. 10. What talk did you have about any other inventions besides the talking-machines and what you have told us about the clock?

A. None that I recollect of.

Cross-Q. 11. Who was present at this interview?

A. No person but him and me.

Cross-Q. 12. What machines did you see on this occasion which you understood had been invented by him or made by him?

A. None that I recollect of except the clock.

Cross-Q. 13. Were you ever at that shop at any other time?

A. I was there once before that.

Cross-Q. 14. Do you mean that you were never there but once before that?

A. I mean that I have no recollection of having been there but once before that.

Cross-Q. 15. How many times have you seen Mr. Drawbaugh within the last ten years?

A. Pretty often; I would not undertake to enumerate; frequently.

Cross-Q. 16. Where have you been in the habit of seeing him?

A. From home; I met him out.

Cross-Q. 17. Whereabouts?

A. I have met him in Shiremanstown, Mechanicsburg, White Hill, and I have met him in a store at Milltown, that I recollect of; on the road, and at other places.

Cross-Q. 18. Do you live on the road between Eberly's Mills and Mechanicsburg?

A. No, sir.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 31st day of May, 1881.
FRED. M. OTT,
Examiner.

W. D. SHOOP.

GEORGE H. BOWMAN, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. I am forty-two; residence, Hummelstown, Dauphin county; my regular trade is millwright; I am milling now.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Penna.? If so, how long have you known him?

A. I have known him since 1876.

Q. 3. How came you to make his acquaintance in 1876?

A. I was working with my brother at Eberly's Mills. He was milling there, and I done the millwright work there, and my brother had no place to work in, and so I went to Drawbaugh's shop to do the work. The work was for the large grist-mill known as Eberly's mill.

Q. 4. In what months of 1876 were you at Mr. Drawbaugh's shop?

A. In February.

Q. 5. Did you see any talking-machines there while you were there at Mr. Drawbaugh's shop?

A. Yes, sir.

Q. 6. Was anybody talking through them?

A. Yes, sir.

Q. 7. Who was talking and listening?

A. I can't tell you who was talking through them. Mr. Drawbaugh was listening.

Q. 8. Where was he, when he was listening?

A. He was on the machinery floor of the shop on the side towards Eberly's mill near the corner, somewhere about the corner, I could not exactly say.

Q. 9. Do you know where the other person was that was talking into the machine?

A. No, sir; I don't.

Q. 10. Did you hear any of the sounds that came through the machine?

A. Yes, sir.

Q. 11. How happened you to hear sounds coming through the machine?

A. I guess there must have been some person at the other end of the wire. I was up close to it—to the machine.

Q. 12. How close were you to the machine when you heard sounds coming through it?

A. I don't think I was over two foot off of it.

Q. 13. How close was your ear to the machine when you heard the sounds coming through it?

A. I could not just tell; may be eighteen inches or two feet, or something like that. I was very close to him, standing right aside of him.

Q. 14. By "him," do you mean Drawbaugh?

A. Yes, sir.

Q. 15. What was he doing with the machine when you heard the sound come through it?

A. He had a kind of an instrument or machine at his ear.

Q. 16. Did you see him talking into a talking-machine while you were there at the shop?

A. Yes, sir; on the same occasion.

Q. 17. Did he listen to hear what came through the machine, and then talk back through the machine to the person at the other end of the line?

[*Objected to as leading.*]

A. Yes, sir; he listened when the sound came back. He talked in and then he listened when the sound came back.

Q. 18. What did it sound like when you heard the sound through the machine?

A. It sounded much like as if you were talking into an empty barrel. I heard the sound, but could not understand what was said.

Q. 19. Did you notice whether the machine was attached to any wires, or not?

A. Yes, sir; I did.

Q. 20. State what it was attached to.

A. It was attached to a kind of a square box.

Q. 21. Was the box attached to anything, or was it so that it could be taken up in the hand?

A. No, sir; it was again the wall somewheres—stationary.

Q. 22. How many wires did you see connected to the talking-machine?

A. I saw one to the machine that he was talking in, but then, as near as I can recollect, there was two other wires run down from the machine to the floor—had some weights or something on, or some kind of stuff in below, I can't tell.

Q. 23. What was the appearance of the stuff in below? What did it look like?

A. Indeed, I can hardly tell you myself. It looked kind of white and greenish stuff.

Q. 24. What was that stuff in?

A. I don't know myself yet, what it looked like—kind of a bottle or jar—maybe it was tin, for all I know. It was so long ago, it has slipped my memory entirely. I did not examine it closely.

Q. 25. Did Mr. Drawbaugh say anything about the talking-machine to you?

A. Not in particular. He showed it to me; that was about all—showed me how it worked.

Q. 26. When were you next at Mr. Drawbaugh's shop after March, 1876?

A. Not till November, 1880.

Q. 27. Please explain what you mean by your twentieth answer.

A. The wire was attached to the square box, and the square box is what he called the talking-machine.

Q. 28. Did he talk into or listen at the square box?

A. He talked into that.

Q. 29. How large was that square box?

A. I could hardly tell you. It must have been about eight or ten inches long, as near as I can recollect, and about four or five inches wide, I guess.

Q. 30. What was its color?

A. I could not tell you that any more.

Q. 31. Do you remember whether its outside was made of wood or not?

A. It was made of wood, but what kind I could not tell you—whether of black walnut or pine, or what kind.

Q. 32. What kind of a contrivance did it have for him to talk into?

A. It was some kind of a machine that was hollowed out that he put his mouth to.

Q. 33. How large was the thing that was hollowed out that he put his mouth to?

A. I could not tell you that any more.

Q. 34. Did you talk into it?

A. No, sir.

Q. 35. How many times did you see that talking apparatus in 1876?

A. Only once; the time I worked there.

Q. 36. Did you work there only once?

A. Just once.

Q. 37. You have given us your recollection of the machine that Mr. Drawbaugh talked into. Do you remember the size of the machine that he listened at when the other man was talking to him?

[*Objected to on the ground that the witness has already testified, particularly in his seventeenth answer, that on that occasion Mr. Drawbaugh listened at the same machine he talked into, and that the whole testimony of this witness, so far, has tended to prove only one machine as in their presence.*]

[*Question withdrawn and following question substituted:*]

Q. 38. Did he talk into and listen at the same machine or different machines?

[*Same objection.*]

A. He talked into one and took another to listen at.

Q. 39. I now repeat the thirty-seventh question.

A. I can't remember that, I don't know what it looked like any more.

Q. 40. Did he take it in his hand and hold it to his ear when listening?

A. Yes, sir.

Q. 41. Was that the machine that you heard the sounds coming through?

A. Yes, sir.

Q. 42. How long were you at Mr. Drawbaugh's shop doing that work on that day?

A. As near as I can mind, about a half a day.

Q. 43. What was going on in the shop at the time, besides Mr. Drawbaugh's operations with his talking-machine?

A. They were working on wagon axles.

Cross-examined by Mr. Storrow:

Cross-Q. 44. What did Drawbaugh tell you he was trying to do with his talking-machines at that time?

A. I can't recollect no more what he told me. He was talking about it, but I can't recollect what he said.

Cross-Q. 45. I suppose he did not just talk into it steadily, without stopping, the whole half a day you were there, did he?

A. No, sir; it was only a few minutes—just showed me how it worked. That was about all.

Cross-Q. 46. You mean that all he did while you were there, about the talking-machines, was just to show them to you, as you have described?

A. As near as I can recollect.

Cross-Q. 47. What was he working on that day?

A. That is more than I can tell, what he was working at. His hands were working on axles. He went after what he was working at, but I did not follow him up. I was attending to my work.

Cross-Q. 48. Was not there a bell on top of the talking-machine that you saw fastened up against the wall?

A. Not that I can mind of.

Cross-Q. 49. Was your brother running the mill on his own account at that time, or what did he have to do with it?

A. Yes, sir; he had the mill rented from Mr. Leonard, and run it on his own hook.

Cross-Q. 50. Did he have a partner; and, if so, who was it?

A. No, sir; he kept a hand.

Cross-Q. 51. Who was the hand?

A. That I am not able to say. A man from Franklin county, as near as I can mind.

Re-direct by Mr. Hill:

Q. Q. 52. How long did your brother run the mill on his own hook?

A. Two years within a month.

Q. Q. 53. Do you remember when he took the mill?

A. In 1874, if I am not mistaken.

Q. Q. 54. Do you know who run the mill after he gave it up?

A. Dellinger & May bought the mill, and Jake Evans was miller. He took the mill when my brother left it.

Re-cross by Mr. Storrow:

Re-cross-Q. 55. What was your brother's name?

A. Cyrus.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 31st day of May, 1881.

FRED. M. OTT,
Examiner.

GEORGE H. BOWMAN.

Adjourned until 2, P. M.

ELEPHONE COMPANY,-1

May 31, 1881, 2, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

CHARLES LINCOLN FREE, *being produced, sworn, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. I am twenty; residence, Camp Hill, Cumberland county; I am a coach-maker by trade.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Penna.? If so, how long have you known him?

A. I have known him for about eight or ten years.

Q. 3. Did you ever see any talking-machines at his shop at Eberly's Mills? If so, when?

A. Between the spring and winter of the year 1879.

Q. 4. State, to the best of your recollection, what time of the year it was when you first saw them.

A. It was in the fall of the year.

Q. 5. How are you able to fix the time as being in the year 1879, between the spring and the following winter?

A. That spring I quit working at the trade. I then stayed with father that summer and winter, and as I had very little to do, I went down to his shop occasionally; and I often got down there, but he only showed it to me once.

Q. 6. State, as near as you can recollect, all that took place with regard to the talking-machine at the time he showed it to you.

A. He showed me in what way—what sound it made, but I can't recollect what he said through it. He opened the case in the corner where the machine was. He told me, then, to go down-stairs. I went down. He told me where it was. Then I listened, to see what he said. The first couple of words I could not understand very plainly, but after that I understood every word he said, plain. Then he told me to go upstairs and talk, and he would listen. He halloed back to me then that he could hear every word I said, through the machine, plain. That is about all that was said then, and I went home.

Q. 7. What was the size and shape of the machine upstairs into which you and Mr. Drawbaugh talked on that occasion?

A. It was something on the order of that machine before you [indicating "J." Something very much like it, if that is not the one

I do not say that is the one; but one like it. He did not show me the inside of the machine, that I recollect.

Q. 8. Do you remember and can you describe the appearance of the machine that you listened at down on the lower story?

A. It was a little round box to put over your ear. It was not very large. It was about two or three inches, I suppose, in diameter.

Cross-examined by Mr. Storrow:

Cross-Q. 9. Who are you working for now, and where?

A. Walmer & Fox, coachmakers, Hummelstown, Dauphin county.

Cross-Q. 10. How long have you been with them?

A. Almost a year.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 31st day of May, 1881.

FRED. M. OTT,
Examiner.

CHARLES L. FREE.

Adjourned until June 1, 1881, at 10 o'clock, A. M.

Wednesday, June 1, 1881.

Examination resumed, pursuant to adjournment.

Present, Mr. Storrow for complainants, and Mr. Hill, and Mr. Jacobs for respondents.

GEORGE LEWIS HALE, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. Born August 13th, 1835; reside in Harrisburg on Balm street; occupation, tinner and coppersmith.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pa.? If so, how long have you known him?

A. I have known him since about 1860,—somewhere along there. I got acquainted with him while I was in Shiremanstown, and that was between 1858 and 1860. I think it was in 1860, though, that I got acquainted with him.

Q. 3. Did you formerly work for Hauck Brothers, at Mechanicsburg, Cumberland county, Penna.? If so, from what time to what time?

A. I commenced working there the last of May or first of June, 1873, and worked there until some time in February, 1876. I think it was the last week in February that I left there and come over to Harrisburg, where I have resided ever since, and have been working for Zollinger & Burke, 307 Market street, during the whole time. While working for Hauck Brothers, I lived at Mechanicsburg.

Q. 4. While you were working for Hauck Brothers, were you ever at Mr. Daniel Drawbaugh's shop, at Eberly's Mills? If so, when were you first there?

A. Yes, sir; it was in the fall of 1873.

Q. 5. Do you remember how you happened to go down there in the fall of 1873?

A. I went down there for a lot of molasses faucets.

Q. 6. While at Mr. Drawbaugh's shop at that time, did he show you any talking-machines?

A. Yes, sir; he showed me a machine there that he called a talking-machine.

Q. 7. Please look at the machines now shown you, marked "B," "F," and "C," and state when and where you first saw them.

A. I saw them in Milltown, there in his shop. I think it was on the second floor in a small room there that he kept for himself. I saw them in the fall of 1873, at the time of the visit above referred to. I don't know the month or the day, but I know it was in the fall, and I know what kind of weather we had when I was there; it was slushy weather; there was snow and wet, and the roads were so bad that I broke a spring of the wagon with the load that I had on.

Q. 8. Did Mr. Drawbaugh at that time talk through the machines to you, or did you hear anybody talk through them?

A. No, sir.

Q. 9. Did you have any conversation with Mr. Drawbaugh about the talking-machine at that time? If so, state, so far as you recollect, what was said.

A. He explained the machine to me and said that he was trying to get up a machine that any person could talk through it or use it; that it would do away with the telegraphing; that any person could talk to another without using any instrument or anything that not every person could understand. He said that he could talk with this machine to the house or any place—to the stores there in Milltown.

Q. 10. At the time when you saw this machine "B" there in the fall of 1873, were the ends of the tin box open, or was either of them closed, and if closed, which end, and how?

A. The end toward the coiled wire here was closed with what I thought was sheepskin or bladder.

Q. 11. Was this machine "C" in the same condition then as now, and if not, how did its condition then differ from now?

A. It had a magnet on here, [indicating the board about the point marked "X,"] when I saw it.

Q. 12. What was the shape and size of that magnet?

A. A horse-shoe magnet. As near as I can get at it, it was about six inches long, and about three inches wide. Somewheres along there.

Q. 13. Which end of that magnet was towards the metal diaphragm?

A. The open end.

Q. 14. Show us how that magnet was arranged.

A. Just in this way, [indicating with two fingers the magnet arranged in a horizontal position, with the two poles in the same horizontal plane, and extending towards the middle of the diaphragm.]

Q. 15. After that visit in the fall of 1873, did you ever again see any talking-machines at Mr. Drawbaugh's shop? If so, when, to the best of your recollection?

A. I think it was in the fall of 1875, as near as I can recollect, that I again saw a talking-machine there.

Q. 16. Please look at the machine marked "D," now shown you, and state whether you recognize it as ever seen by you before, and if so, state when and where you first saw it.

A. This machine I saw there in the fall of 1875, when I was there. He said it was an improvement on his first machine.

Q. 17. Since you stopped working for Hauck Brothers, in February, 1876, have you, or not, ever been at Mr. Drawbaugh's shop, at Eberly's Mills?

A. Not that I can recollect of.

Q. 18. When you saw this machine, "C," at Drawbaugh's shop, in the fall of 1873, do you remember whether there were any wires connected to the magnet on the machine?

A. There were some copper wires connected with it.

Q. 19. Do you remember where you were residing at the time of the Centennial Exposition at Philadelphia?

A. I lived in the same house, on the same street, that I live on now.

Q. 20. Did your family attend the Centennial?

A. Yes, sir; we were all down.

Cross-examined by Mr. Storrow:

Cross-Q 21. Who was present at Drawbaugh's shop on the first occasion you have testified about?

A. There was no person there but Mr. Drawbaugh; that is, not where I saw the machine—where him and I were talking together.

Cross-Q. 22. Who was at work in the shop?

A. His brother, 'Squire Drawbaugh; I think his name is John.

Cross-Q. 23. Who was present on the second occasion you have testified about?

A. No person, but Mr. Drawbaugh.

Cross-Q. 24. Who was at work in the shop at that time?

A. No person; no one there but Mr. Drawbaugh and myself.

Cross-Q. 25. When you saw the instrument "C," did he give you to understand that it had always had that magnet on it?

A. Yes, sir.

Cross-Q. 26. Did you notice whether the two upright pieces of wood were cut out, or hollowed out, at the back sides as they are now?

A. Yes, sir.

Cross-Q. 27. What fitted into that hollow at the time you saw it?

A. I can't tell exactly. That magnet was fixed on here some way, but I don't recollect how it was. I remember that it was on this platform here, but how it was fastened I can't tell. It has been so long, and I did not pay much attention to it, so that I forgot how it was fixed there. Generally, when I see a thing that way, I look at it, and I don't remember much about it, unless it is something very interesting.

Cross-Q. 28. Did you ask him to show you a talking-machine, or did he just offer to show it to you, and make the first motion?

A. He offered to show it to me.

Cross-Q. 29. Tell me everything else he said to you about it on that occasion, that you can remember.

A. He told me to come into the room there. He was working in the outside room. I don't recollect; I think it was on the second story, where the machinery was. He had a little room there he kept for himself,—always kept it locked. I don't know whether it was on the second or third story. I think it was on the second story, the first floor above the basement, that he had his room. He showed me the machine, and said he was getting up a machine to answer in place of telegraph. That two persons could talk to each other without using any machinery that other persons did not understand; any person could talk through it.

Cross-Q. 30. Can't you recollect anything else he said to you about it? If so, please state it.

A. I mind of him saying it was driven by a magnet,—in that way—same as the telegraph. I did not have time to talk with him much—too short a time.

Cross-Q 31. Please state all that he said to you about talking-machines at the second visit that you have testified about.

A. He showed me this machine here, ["D"] and he said that it was an improvement on the old machine that he had.

Cross-Q. 32. Is that all he said to you?

A. He showed me different things, and, as we walked along there, he picked this ["D"] up from the bench, and said, "This is an improvement on my old talking-machine." That is all the explanation he gave me about it.

Cross-Q. 33. Was that the whole of your conversation about talking-machines on that occasion?

A. Yes, sir; times that I went down there I always went on business—for faucets; time was always precious. We would slip through, and he would show me the things, and then I would load up my load and be off.

Cross-Q. 34. What work did you do for Hauck Brothers at Mechanicsburg?

A. Worked at tinning.

Cross-Q. 35. Where did you work?

A. Mechanicsburg, Cumberland county.

Cross-Q. 36. In what shop?

A. In Hauck & Co.'s stove and tin establishment.

Cross-Q. 37. You mean you worked on stove and general tinware?

A. I worked on roofing, spouting, and general tinware.

Cross-Q. 38. Who were the firm of Hauck Brothers?

A. George and Samuel Hauck, Jrs.; that was the firm I worked for. There was another firm of George and Samuel Hauck, Sr., but that was a different concern.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 1st day of June, 1881.
FRED. M. OTT,
Examiner.

G. L. HALE.

WILLIAM B. STONE, *being produced, affirmed, and examined, saith:*

Q. 1. State your age, residence, and occupation.

A. Fifty-one; residence, Siddonsburg, York county; occupation, farmer.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pa.? If so, how long have you known him?

A. I have known Daniel Drawbaugh for about twenty years.

Q. 3. Please state whether or not you ever saw any talking-machines in his shop at Eberly's Mills, and if so, when.

A. I did; on the fifteenth of October, 1871.

Q. 4. How do you fix the date?

A. On that day I went over to George Free's, near White Hill station. I took over a couple of papers of chicken powder. Then I went from Mr. Free's down to 'Squire John Drawbaugh's, a brother of Dan Drawbaugh, and from the 'Squire's down to Dan Drawbaugh's factory. He was in the factory.

Q. 5. Did you make, at the time, any written memorandum or book-entry of your visit to Mr. Free?

A. Yes.

Q. 6. Will you please produce the book and point out the entry to the examiner, in order that he may copy it upon the record?

A. Here it is.

[*The witness produces a book and points out a memorandum, which the examiner copies, as follows:*

"*Sold Mr. George Free*
2 *packages of chicken*
powder, 25 *cts.*=50.
Oct. 15*th*, 1871———"]

Q. 7. Was this entry made in your own handwriting at the time?

A. Yes, sir; in my handwriting.

[*Objection to the use of the entry in the book, unless the book itself is put in evidence.*]

[*Witness states that there are a few pages containing private entries, which he prefers not to exhibit, and by consent, those pages are cut out by the witness and retained by him. The book is then put in evidence by Mr. Hill, marked on the outside, and also on the page containing the memorandum above referred to, with the words "Exhibit Stone."*]

Q. 8. Will you please look at the machines marked "B," "F," and "C," now shown you, and state whether you ever saw them before today, and if so, when and where?

A. This machine ["F"] I did and this one ["C"] also, and I saw this machine ["B"] also, at the same time. It was at Mr. Drawbaugh's factory, the 15th of October, 1871.

Q. 9. Did you ever see any talking-machines at Mr. Drawbaugh's shop after that day?

A. I don't recollect. I was in his shop once afterwards. I was only there a few moments, and then he was very busily engaged, and did not appear to have time to look around, and so I left him.

Q. 10. At the time when you saw those three machines, on the 15th of October, 1871, did you have any conversation with Mr. Drawbaugh about the talking-machine? If so, state all that you can remember of it.

A. I told Mr. Drawbaugh, I heard he was getting up a talking-machine. He said he was; then he showed me this ["F,"] and also this ["C,"] and this ["B,"] at the same time. I asked him whether he thought it would work. He said he was satisfied that it would. He said it was something that would astonish the world. That is about all the talk we had about it, at that time.

Q. 11. Did you ever have any talk about it with him afterwards, when you saw him for a few moments, as you have testified?

A. No; we did not talk any about it then.

Q. 12. Did he talk through the machines for you, at the time when you saw them in 1871?

A. No; he did not talk through them. He just merely showed them to me.

Q. 13. Do you recollect whether you saw anything belonging to the machines in 1871 that you do not now see on them?

A. No, I don't; it appears to me they are about the same as they were then. I don't think there is any change on them. This old glass [" F, "] particularly drawed my attention—the bottom being out.

Cross-examined by Mr Storrow:

Cross-Q. 14. Where did you live in 1871?

A. In Harrisburg.

Cross-Q. 15. Which street and number?

A. At four fifty-eight Cumberland street. I made my home with my sister, whose name is Mary E. Jones. I have been a widower for fifteen years.

Cross-Q. 16. Where do you live now?

A. I live about a mile from Siddonsburg.

Cross-Q. 17. In which direction from Siddonsburg, and on what road?

A. It is on the road leading from Mechanicsburg to Pinetown and Lewisberry. I live south of Siddonsburg.

[*Mr. Storrow asks the examiner to note the following things from the book " Exhibit Stone." It is entitled on the cover: " Pierce's Memorandum and Account Book,' "A present from the People's Medical Servant, R. V. Pierce, M. D." It consists of alternate pages of printed advertisements and recommendations of his medicines, and blank pages for memoranda; on the outside of the cover the following is printed: "Entered according to act of Congress, in the year* 1876, *by R. V. Pierce, M. D., in office of Librarian of Congress, at Washington." Under the head of " consumption," the first letter of recommendation, which is printed, is dated, " Shipman, Ill., June* 13, 1876."]

Re-direct by Mr. Hill:

Q. Q. 18. This memorandum book, which I had not examined until during your cross-examination, was not printed until as late as 1876 or 1877. Explain how you could make a memorandum in a book in 1871, when the book was not printed for five or six years afterwards?

A. I had an old book that I carried in my pocket for a long while. It became almost worn out; it was nearly all destroyed and obliterated that I hardly could read it. I took and copied this out of that book into this.

Q. Q. 19. What has become of that old book?

A. It is all worn out. It may be lying around home somewhere, or leaves of it, but I don't know where it is. My attention was particularly called to this, because this chicken powder, that I sold to Mr. Free, was the first I ever sold; it is my own invention.

Q. Q. 20. How long ago did you copy off the memoranda from the old book on to this one?

A. About two years ago; I think in 1879.

Q. Q. 21. In your fifth answer, you stated that you made a written memorandum at the time of your visit to Mr. Free. In my sixth question, I asked you to produce the book in which you made it, and in reply you produced this book. Did you, or did you not, understand my question as calling for *the* particular book in which you first entered the memorandum?

[*Question objected to as leading and improper.*]

A. No; I did not understand it.

Q. Q. 22. What is your recollection as to the time when you invented the chicken powder which you refer to?

A. The time I invented the chicken powder I was living here—in Harrisburg.

Q. Q. 23. When did you move away from Harrisburg?

A. About October, I think, 1879, I permanently took my things over there from here.

Q. Q. 24. How certain are you that when you copied the entry about the visit to Mr. Free, from the old book into the new one, you copied it correctly?

[*Objected to, unless the old book is produced, or its absence accounted for.*]

A. I am very well satisfied in my own mind that I did,—that I copied it just as it was in the old book.

Q. Q. 25. When you return home, will you make thorough search for the old book or its leaves, and if you can find it, or any part of it, will you produce it here?

A. I will.

Re-cross by Mr. Storrow:

Re-cross-Q. 26. Who told you to bring this book with you to-day?

A. No person, to day. Yesterday I was asked the question about what time I was over at Mr. Drawbaugh's. I said I could not say just the day and time. I thought it was in 1871 or 1872, but I knew that I had made a memorandum of the time that I went over to Mr. Free's with the chicken powder, for on that same day I went down to Mr. Drawbaugh's. I had to go home yesterday to bring this book.

Re cross-Q. 27. Did the gentleman you were talking with yesterday tell you that you were to go home and get this book, and then come back and testify?

A. Yes; they said it would be better for me to get it, that they would like to know the time.

Re-cross-Q. 28. Where was it that you had this conversation yesterday?

A. Up in Mr. Jacobs' office.

Re-cross-Q. 29. Was it in the forenoon or in the afternoon?

A. I think it was in the afternoon. No, I am mistaken, it was just about dinner-time, at noon.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 1st day of June, 1881.
FRED. M. OTT,
Examiner.

W. B. STONE.

Recess for dinner until 3, P. M.

E. B. HOFFMAN, *being produced, sworn, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. Age, thirty-five; residence, 1335 Ridge Road, Harrisburg; occupation, machinist.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pa.? If so, how long have you known him?

A. I have known him since 1861 or 1862,—around there some time.

Q. 3. State whether or not you worked at Mr. Drawbaugh's shop, at Eberly's Mills, prior to 1870, and if so, state for whom you worked, what you were working upon, and at what time you began.

A. Yes, sir; I worked there in 1868, for the Drawbaugh Faucet Company, if I am not mistaken in the name of the firm. Mr. Gorgas and others were connected with it. I was working upon molasses faucets and rotary pumps. I think I began the latter part of March or the beginning of April. It was pretty cold yet I can't tell the exact date. The firm had gone to work there before I came.

Q. 4. How long did you continue to work for said Faucet Company?

A. Until the latter part of September of the same year.

Q. 5. While you were working there for said Faucet Company, did you or not have any knowledge of Mr. Drawbaugh's talking-machines?

A. I did. I seen him working on one. He called it "a talking-machine at the time."

Q. 6. Do you see the instrument here which you then saw him working upon?

A. I do, or one like it. This here [indicating "F."]

Q. 7. What was he doing to the instrument "F," or any part of it, at that time?

A. I seen him turning this wooden top, and fitting it on. At that time there was nothing but the clear glass. There was no coating inside.

Q. 8. How happened you to see him turning that top and mouthpiece?

A. I was down at the shop. I used to go down there in the evening, after working hours.

Q. 9. Do you recollect a freshet that occurred in that locality some years after the time you have referred to, which washed away several bridges on the Yellow Breeches creek?

A. I do; there was a freshet in 1873, in the latter part of the summer. I can't remember the exact time. I was on the creek at the time. It washed away the foot-bridge at the mill known as Dittler's mill at that time; and also the red bridge up at Heck's.

Q. 10. How happened you to be out on the creek at that time, and how long were you there in that vicinity?

A. I was up there fishing for fish and turtle. I was there four days.

Q. 11. During any of those four days, were you at Mr. Drawbaugh's shop, at Eberly's Mills?

A. I was; once or twice in the four days.

Q. 12. State whether you saw any talking-machines at that shop at that time.

A. I did; at least he told me they were talking-machines. I did not examine them.

Q. 13. Please look at the machine marked "C," now shown you, and state whether you ever saw it before to-day. If so, when you first saw it.

A. I saw that machine, but I can't tell the date. It was a good while ago. I saw this other machine [indicating "I"] at the time I was up there fishing; and I saw "C" before that. There is not all of this machine "C" here that I saw at that time.

Q. 14. Please state what part or parts of the machine "C" that you saw at that time are not now here.

A. There was a large horse-shoe magnet that extended out about two inches over the back end of the base board that is not here now. I should judge it was about eight inches in length. It was made of four pieces of steel, about one eighth of an inch thick, riveted together, one on top of another.

Q. 15. What, if any, conversation did you have with Mr. Drawbaugh at the time he showed you the machine with that magnet?

A. We had been talking about machinery on the lower floor of the shop. He told me that he had made a new powerful magnet for his talking-machine, and that I should come up stairs and see it.

Q. 16. Did you at any time see this machine "B," whilst you were in the shop? If so, when first?

A. I might have seen it, but I can't recollect of seeing it—can't name no time. I am not positive on that question. He had so much there that I could not recollect.

Q. 17. Did you ever talk or hear anybody talk through his talking-machines while you were there?

A. I never talked through one at that time. I have since, but I heard Mr. Drawbaugh talk through one at that time.

Q. 18. Were you at Mr. Drawbaugh's shop several times between the summer of 1868 and the time of the freshet?

A. Yes; I was there once or twice between that time.

Q. 19. When did you first hear Mr. Drawbaugh talk through the talking-machine?

A. In the fall of 1871.

Q. 20. Did you understand what he said through the machine?

A. Yes, sir; he asked me through it what I thought of the machine. I was down-stairs at the time, and he spoke through it.

Q. 21. You say that you afterwards talked through one of his talking-machines. Do you remember when that was?

A. I think it was in October, 1874.

Cross-examination waived by Mr. Storrow.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 1st day of June, 1881.
FRED. M. OTT,
Examiner.

E. B. HOFFMAN.

Adjourned until June 2d, 1881, at 10, A. M.

June 2, 1881.

Examination resumed, pursuant to adjournment.

Present, Mr. Storrow for complainants, Mr. Hill and Mr. Jacobs for respondents.

GEORGE FREE, *being produced, affirmed, and examined, saith:*
Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. Forty-one; residence, White Hill, Cumberland county; occupation, at present, dealer in cattle, horses, and all kinds of stock.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pa.? If so, how long have you known him?

A. Yes, sir; I have known him for thirty-five years or more.

Q. 3. Do you remember visiting Mr. Drawbaugh's shop, at one time, in company with Mr. John A. Oyster, who is now present?

A. Yes, sir; I do.

Q. 4. Are you able to fix the day or year of that visit?

A. Of my own memory, it was either in 1874 or 1875. I am positive that it was not later than 1875, and I think it was in May or June, but am not positive.

Q. 5. Do you remember on what day of the week it was?

A. On the Sabbath.

Q. 6. Did Mr. Drawbaugh, on that occasion, exhibit any talking-machines to you and Mr. Oyster?

A. Yes, sir; he did.

Q. 7. Did he talk through them to you?

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A. Yes, sir.

Q. 8. Where was he when he was talking through them, and where were you when you were listening at the machine?

A. Mr. Drawbaugh was up on the second story of his machine-shop, and I was down below in the cellar, under the machine-shop.

Q. 9. How many floors were there between you and him?

A. Two.

Q. 10. Were there any doors, and if so, were they closed while the talking was going on?

A. There were two doors. I can't be positive about them both being closed, but one of them was.

Q. 11. From where Mr. Drawbaugh was to where you were when you were listening, could you or could you not have heard what he said without the aid of the machine?

A. No, sir; you could not have heard it, unless he would have hollowed very loud.

Q. 12. Did you hear and understand what he said through the machine?

A. Yes, sir; I did, part of it. I could not understand him—all. I remember of him singing "Yankee Doodle" in it. That I can remember as distinctly as if it was to-day yet.

Q. 13. Did he sing the words of "Yankee Doodle," or only the tune?

A. He sang the words.

Q. 14. Did he talk, or ask any questions through the machine, besides singing through it?

A. Yes, sir; he did, but the words and the questions I can't remember any more what they were.

Q. 15. How did you know that it was Mr. Drawbaugh who was talking through the machine while you were listening?

A. I could understand his voice—that it was his voice. When I put the machine to my ear, I could understand it very distinctly.

Q. 16. If there had been a good many other persons in the room above with Mr. Drawbaugh at the time, could you or could you not have recognized his voice, as distinguished from any other voice through the machine?

[*Question objected to, because the question is hypothetical, and because the witness has no means of answering it.*]

A. Yes, sir; I could have distinguished his voice.

Q. 17. Please look at the machines, "A," "B," and "F," now shown you, and state whether you ever saw them before, and if so, when you first saw them, so far as you recollect.

A. I have seen them before, or something like these These might be the machines. I first saw them on that Sabbath, when I was at the shop, as I have above testified.

Q. 18. Was it any one of these machines, that you listened at in the cellar? If so, which one?

A. This one, [indicating "A,"] or one like this one, I listened at.

Q. 19. Was that the one, or like the one you were listening at, in the cellar, when you heard him singing "Yankee Doodle," and talking and asking questions through the machine?

A. Yes, sir; this is the one, or one like it.

Q. 20. Was that machine at which you listened in the cellar connected in any way with anything in the room where Mr. Drawbaugh was, on the second floor above? If so, how was it connected?

A. Yes, sir; it was connected with wires. Two wires run from where Mr. Drawbaugh was down into the cellar, where I was, and connected to this machine "A."

Q. 21–22. While in the room where Mr. Drawbaugh was, on the second floor, did you see any vessel or vessels shaped like jars, and containing a green and white substance or liquid?

A. Yes, sir; I did. After I came up from the cellar, Mr. Drawbaugh showed it to me then.

Q. 23. What did he say about them when he showed them to you?

A. I can't remember his conversation any more. He explained to me, but I can't remember what it was.

Q. 24. Did they have anything to do with the talking-machine or not?

A. Yes, sir; they had.

Q. 25. Do you remember whether they were in any way connected with the talking-machine up on that floor, and if so, what do you remember about the connection?

A. Yes, sir; they were connected by two wires, to the best of my knowledge.

Q. 26. From the time when you were there at the shop with Mr. Oyster, as you have testified, down to the beginning of the year 1880, were you or not occasionally in Mr. Drawbaugh's shop again?

A. Yes, sir; I was.

Q. 27. Were you there during the time that Mr. Chellis has been manufacturing faucets and motors at that shop?

A. Yes, sir; I have been there since.

Q. 28. Did you see Mr. Drawbaugh doing anything with talking-machines during that time, since Mr. Chellis began manufacturing faucets and motors there?

A. Yes, sir; I did.

Q. 29. Were you there at the shop at any time or times when the Electric Clock Company, consisting of Mr. Shettel and the Grissingers, were carrying on business there at the shop?

A. Yes, sir; I was.

Q. 30. How often, to the best of your recollection, were you there while that Clock Company were carrying on business there?

A. May be five or six times, or perhaps more, in a year.

Q. 31. On Sundays, or week days, or both?

A. Principally on Sundays; I have been there on both.

Q. 32. What, generally, caused you to go there?

A. In the summer time we would go there to bathe in the creek, right close to the machine-shop, and Mr. Drawbaugh and I have been intimate friends, and I would always stop in to see him.

Q. 33. While the Electric Clock Company were carrying on business there at the shop, did you ever see Mr. Drawbaugh doing any work on his talking-machines?

A. Yes, sir; I did. He had a machine made to cover the wire, and I remember distinctly seeing him work at that part of it, and I asked him what it was for, at the time, and he told me it was for his talking-machine. That is the reason I know what it is for. I saw him frequently working at it, but principally on Sunday. The most work that I saw him doing at the talking-machine was on the Sabbath. This was the case that year and other years. In fact, I was oftener there on the Sabbath. He would attend church in the morning and go to work in the afternoon.

Q. 34. When you would be there at the shop from time to time between the summer of 1875 and the time the Clock Company started up, did you see Mr. Drawbaugh doing anything with his talking-machines?

A. Yes, sir; I did.

Q. 35. How often during that time?

A. Yes, sir; I could have distinguished his voice.

Q. 17. Please look at the machines, "A," "B," and "F," now shown you, and state whether you ever saw them before, and if so, when you first saw them, so far as you recollect.

A. I have seen them before, or something like these. These might be the machines. I first saw them on that Sabbath, when I was at the shop, as I have above testified.

Q. 18. Was it any one of these machines, that you listened at in the cellar? If so, which one?

A. This one, [indicating "A,"] or one like this one, I listened at.

Q. 19. Was that the one, or like the one you were listening at, in the cellar, when you heard him singing "Yankee Doodle," and talking and asking questions through the machine?

A. Yes, sir; this is the one, or one like it.

Q. 20. Was that machine at which you listened in the cellar connected in any way with anything in the room where Mr. Drawbaugh was, on the second floor above? If so, how was it connected?

A. Yes, sir; it was connected with wires. Two wires run from where Mr. Drawbaugh was down into the cellar, where I was, and connected to this machine "A."

Q. 21–22. While in the room where Mr. Drawbaugh was, on the second floor, did you see any vessel or vessels shaped like jars, and containing a green and white substance or liquid?

A. Yes, sir; I did. After I came up from the cellar, Mr. Drawbaugh showed it to me then.

Q. 23. What did he say about them when he showed them to you?

A. I can't remember his conversation any more. He explained to me, but I can't remember what it was.

Q. 24. Did they have anything to do with the talking-machine or not?

A. Yes, sir; they had.

Q. 25. Do you remember whether they were in any way connected with the talking-machine up on that floor, and if so, what do you remember about the connection?

A. Yes, sir; they were connected by two wires, to the best of my knowledge.

Q. 26. From the time when you were there at the shop with Mr. Oyster, as you have testified, down to the beginning of the year 1880, were you or not occasionally in Mr. Drawbaugh's shop again?

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A. Yes, sir; I was.

Q. 27. Were you there during the time that Mr. Chellis has been manufacturing faucets and motors at that shop?

A. Yes, sir; I have been there since.

Q. 28. Did you see Mr. Drawbaugh doing anything with talking-machines during that time, since Mr. Chellis began manufacturing faucets and motors there?

A. Yes, sir; I did.

Q. 29. Were you there at the shop at any time or times when the Electric Clock Company, consisting of Mr. Shettel and the Grissingers, were carrying on business there at the shop?

A. Yes, sir; I was.

Q. 30. How often, to the best of your recollection, were you there while that Clock Company were carrying on business there?

A. May be five or six times, or perhaps more, in a year.

Q. 31. On Sundays, or week days, or both?

A. Principally on Sundays; I have been there on both.

Q. 32. What, generally, caused you to go there?

A. In the summer time we would go there to bathe in the creek, right close to the machine-shop, and Mr. Drawbaugh and I have been intimate friends, and I would always stop in to see him.

Q. 33. While the Electric Clock Company were carrying on business there at the shop, did you ever see Mr. Drawbaugh doing any work on his talking-machines?

A. Yes, sir; I did. He had a machine made to cover the wire, and I remember distinctly seeing him work at that part of it, and I asked him what it was for, at the time, and he told me it was for his talking-machine. That is the reason I know what it is for. I saw him frequently working at it, but principally on Sunday. The most work that I saw him doing at the talking-machine was on the Sabbath. This was the case that year and other years. In fact, I was oftener there on the Sabbath. He would attend church in the morning and go to work in the afternoon.

Q. 34. When you would be there at the shop from time to time between the summer of 1875 and the time the Clock Company started up, did you see Mr. Drawbaugh doing anything with his talking-machines?

A. Yes, sir; I did.

Q. 35. How often during that time?

A. That I can't recollect how often. I saw him work at it, but the number of times I can't really say, and I did not see him just every time I came into the shop.

Q. 36. During that time, from the summer of 1875 to the spring of 1878, did you, or did you not, see him working at the talking-machine, or doing something with it, quite a number of times?

A. Yes, sir; I did.

Q. 37. As you would be in his shop from time to time, from the summer of 1875 to the beginning of 1880, did you see other talking-machines there that you had not seen in the summer of 1875?

A. Yes, sir; I did.

Q. 38. During those years, from the summer of 1875 to the year 1878 or 1879, did Mr. Drawbaugh ever state to you what he desired to accomplish by any of his improvements on his talking-machine? If so, state as nearly as you can what he said about it.

A. Yes, sir; he did. He stated to me that he wanted to accomplish, and could do it, to make a machine that you could stay in one corner of the room, and put the machine in the other corner, and hear as distinctly what was said in the machine, as well as putting it to his ear. He stated also that he was working at it on that principle, to improve it that he could hear across the room from one corner to the other.

Q. 39. How many times during the years 1875, '6, '7, '8, and '9, did you hear Mr. Drawbaugh make remarks to that effect?

A. I could not say how many times. Different times, when I would be in there, he would talk about it, and I have asked him questions about it, whether he had it accomplished. That I have done frequently, and his answer would always be, "No, sir; I am working at it, and I am going to get it accomplished." I can remember his words yet.

Cross-examined by Mr. Storrow:

Cross-Q. 40. Please tell me anything else that you remember that you heard Mr. Drawbaugh say about his talking-machine.

A. Indeed, I can't. He did say a good deal about it, but I can't remember it. He always had a great deal to say about it.

Cross-Q. 41. Please tell me all that you can remember, or anything that you can remember.

A. I have told about all that I know about it, that I can get into my memory at present.

Cross-Q. 42. Are these instruments, "A," "B," and "F," now on the table before you, in the same condition that they were in when you first saw them at Drawbaugh's shop?

A. No, sir; they are not quite in the same condition. The coating inside of this ["F"] was heavier and thicker than it is now; and also the coating in this one ["B"]; they seem to be the same in other respects. This machine ["A"] is the same, to my knowledge, that it was when I had a hold of it.

Cross-Q. 43. On that first Sunday, when you say that you and Mr. Oyster went to Mr. Drawbaugh's shop, who else was there besides you three?

A. No person, to my recollection, but us three.

Cross-Q. 44. Can't you recollect anything else that Mr. Drawbaugh said to you on that day about his talking-machines?

A. There is something came into my memory since I have been studying over it that I do recollect. It was that very day, too, Mr. Drawbaugh said that the talking-machine could be used to talk at a long distance; "from Philadelphia to California," are the very words that he used. I heard so much of it that I can't keep it in my memory.

Cross-Q. 45. What did you and Mr. Oyster go there for that Sunday?

A. To get a small cone, I think they term it, to put on the mowing-machine.

Cross-Q. 46. Do you mean it was one of Kline's conical patent axle fixings that you went there for?

A. Yes, sir; it was to connect to a mowing-machine, also. I don't think it was more than two inches long. It was only a small affair.

Cross-Q. 47. Were they making those Kline patent conical spindles there at the shop at that time?

A. Yes, sir; they were.

Cross-Q. 48. How far is White Hill from Drawbaugh's shop?

A. About one mile.

Cross-Q. 49. Who did you ever meet there on any of these Sundays, when you say you went there?

A. I declare if I can remember any person just personally. I have met different persons there, but to name them, I can't tell you who they were. I did go from my place direct to the shop one Sunday with a gentleman. Mr. Drawbaugh showed us the machinery that time. There were two of us together that time.

Re-direct by Mr. Hill:

Q. Q. 50. At the time you saw this machine "B" there, in the summer of 1875, on that Sunday when Mr. Oyster was there with you, do you remember whether the tin box was open at both ends, as it is now?

A. Indeed, I don't. I can't remember whether it was open or whether it was shut.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 2d day of June, 1881.
FRED. M. OTT,
Examiner.

GEORGE FREE.

Recess for dinner until 2, P. M.

June 2, 1881, 2, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

JOHN A. OYSTER, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. Twenty-nine; residence, Camp Hill, Cumberland county; occupation, farmer.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Penna.? If so, how long have you known him?

A. I have known him about twelve years.

Q. 3. You were present this forenoon and heard a part of the testimony of George Free, I believe. Am I correct?

A. Yes.

Q 4. Do you recollect the incident that he mentioned of his being at Mr. Drawbaugh's shop one Sunday in company with you?

A. I do.

Q. 5. Are you able to fix the time of that occurrence? If so, when was it?

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A. Yes; it was on or about the 21st of June, 1875.

Q. 6. What did you go there for on that occasion?

A. Bear, Kline & Co. were manufacturing the compensation spindle and offered to put a journal on the connecting rod of my reaper and mower, and I took the machine there, used it, after taking it home, part of a day, which was on Saturday. I lost the cone from the journal, and could not use the machine until I got another. Not wishing to be detained on Monday, I drove to Mr. Drawbaugh's on Sunday, to get the lost part, and on my way I picked up George Free, who accompanied me to Mr. Drawbaugh's shop, where we found him working on what he called a talking-machine.

Q. 7. Was that repair made on the grain-cutting or grass-cutting part of the machine?

A. It was made on the grass cutting-part.

Q. 8. Was it your understanding at the time that Bear, Kline & Co. were to make such repair free of charge, or not?

A. They were to make it free of charge.

Q. 9. How are you able to fix the year 1875 as the year of that visit?

A. I began farming in 1874, and bought a second-hand reaper and mower, the pitman of which was about worn out, and I was required to get a new one before the machine could be used again. Bear, Kline & Co. suggested that, as I was getting a new one, I should use one of theirs to test the practibility of it. I believe that was about the way they spoke.

Q. 10. Did you have any further repairs made on that machine in the year 1876? If so, what and when?

A. In 1876 my grain-bar required the same attachment as the grass-bar had, which I had had put on in 1875. It was then put on to the grain-bar in 1876. It was some time either in May or June, because I cut wheat in the latter part of June.

Q. 11. Was that attachment to the grain-bar to be paid for?

A. No, sir; it was not to be paid for. It was part of the contract that they were to put it on, and I was to test it.

Q. 12. Did that firm of Bear, Kline & Co., or M. M. Grove & Co., do any other work for you in 1875 or 1876, except what you have stated?

A. No, sir.

Q. 13. Their books show a charge against you for some work done in June, 1876. Was that charge entered at the time of the first work or the second work which you had done?

A. I don't know. There was to have been no charge at all. If entered in June, 1876, it was at the time of the second work.

Q. 14. With whom—that is, with what member of the firm—did you make the arrangement to have the devices put on your reaper and mower without charge?

A. First, with Mr. Bear; afterwards, with the full consent of Mr. Kline and Mr. Grove.

Q. 15. When you and Mr. Free were in Mr. Drawbaugh's shop on that Sunday in June, 1875, do you recollect the circumstance of Mr. Free going into another part of the shop to listen, while Mr. Drawbaugh talked through his talking-machine?

A. I do.

Q. 16. Did you go with Mr. Free, or remain with Mr. Drawbaugh?

A. I remained with Mr. Drawbaugh.

Q. 17. Please look at the instruments now shown you, marked "A," "B," and "F," and state whether or not you remember seeing them there at Mr. Drawbaugh's shop on that day.

A. I recollect seeing instrument marked "A" and "B," and a machine that looked very much like the one marked "F." I think this ["F"] is the glass or machine that I seen.

Q. 18. Did you talk into any of the machines yourself?

A. I don't think I did.

Q. 19. From that Sunday in June, 1875, down to the beginning of 1880, were you occasionally at Mr. Drawbaugh's shop again? If so, how often, as near as you can remember?

A. About twice or three times a year, I think.

Q. 20. How far from Mr. Drawbaugh's shop did you live during those years, from the summer of 1875 down to the beginning of 1880?

A. About two miles.

Q. 21. As you would be there from time to time during all those years, did you see any more talking-machines that you did not see at the time of your visit in 1875?

A. I did see some instruments.

Q. 22. Give us your best recollection as to about how many.

A. There may have been two, three, four, or five; perhaps more.

Q. 23. Did they resemble the machines "A," "B," and "F" in form, or were they of a different form?

A. I remember a larger box or machine, perhaps eight inches in diameter. I can't say now whether it was a round machine, or octagonal; I think it was an octagonally shaped machine. Also some smaller machines or boxes.

Q. 24. I now show you instruments marked "D," "E," "G," "K," "L," "M," and "O," and ask you whether or not the smaller instruments that you saw at Mr. Drawbaugh's shop between the year 1875 and 1880 resemble these, or any of these, in general appearance.

A. I have seen a quantity of instruments about the size of these, and I think, perhaps, more than there are here, from time to time, at Mr. Drawbaugh's shop. The dates of my visits there are only fixed by the circumstances of my connection with the spindle company. I don't mean to say that I saw all these at one time, but that I saw them from time to time. The date of the only visit that I can fix, is fixed by my connection with the spindles, as I have already testified.

Cross-examined by Mr. Storrow:

Cross-Q 25. On the occasion of your visit with Mr. Free, did you see Mr. Drawbaugh talk into any of these machines, and if so, which one?

A. He may have talked through the machine. I can't remember positively that he did, but think he did. I could not answer which one, not remembering positively that he did. I remember distinctly his showing them to us, and explaining the principles on which they were to act, comparing the film, or thin substance spread over the end of a tin can, as I remember it, to which a wire was attached, or came close to it, the sound to strike that and be conveyed in the same manner that the sound strikes the ear, and that I know took place on that day, because that is one of the points I took notice of. I think I did not take so much account of the test as I did of the principles. I was more interested in the explanation of the principle than I was in the test, and that is the reason I do not remember distinctly of his speaking through it.

Cross-Q. 26. Please tell me everything else you recollect that Mr. Drawbaugh said to you about his talking-machine on that occasion.

A. He spoke about improvements that he thought of making and was experimenting.

Cross-Q. 27. You and Mr. George Free have talked over this visit a little in the last six months or a year, have not you—or talked about it a little to each other?

A. No, sir; not within the last nine months.

Cross-Q. 28. When did you and he last mention it?

A. That I can't tell you. If you can tell me when this litigation first began to be talked about and agitated, then I can tell you. I will give you the substance of the conversation and the circumstances, and you can judge for yourselves. One evening I had gone to our store, where Mr. Free was sitting. He came to meet me, and asked me if I remembered the Sunday that he and I drove into Milltown to get my reaper fixed; and I told him I did, and I asked him why. He refused to tell me, and I told him if it was a secret, he had better not divulge it, and that was the way we quit, and I walked into the store. That is the only conversation I ever had with Mr. Free on the subject.

Cross-Q. 29. Did you tell him then, or any time after, what the date was, according to your recollection?

A. I never told him, that I can remember. I never spoke to him about it, because we very seldom meet.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 2d day of June, 1881.

FRED. M. OTT,
Examiner.

J. A. OYSTER.

Dr. JOHN W. MOFFITT, *being produced, sworn, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. I am forty-six years of age; live in Harrisburg, Penna., No. 7 North Market Square, and am a Dentist by profession.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pa.? If so, how long have you known him?

A. I have known him twenty-five years, at least.

Q. 3. During the past seven or eight years, have you been in the habit of frequently visiting his shop, at Eberly's Mills, or not?

A. I have.

Q. 4. What caused you to go out there frequently?

A. Trout fishing, and the interest I took in the various and numer-

PHONE COMPANY,-1

ous inventions that Daniel Drawbaugh was making and experimenting on.

Q. 5. Did you ever see any talking-machines there, and if so, when did you first see them, to the best of your recollection?

A. I have; and as near as I can recollect, in 1873 first, and from then till now.

Q. 6. Did you at one time purchase an interest in his measuring faucet, and undertake its manufacture? If so, about when was that?

A. I did; as near as I can recollect, November or December, but I am not certain whether it was 1879 or 1880.

Q. 7. Was it the November or December before or after the interference of Drawbaugh against Hauck?

A. It was before. I was already engaged in the business when that interference was in progress.

Q. 8. You testified as a witness in that interference, did you not?

A. I did.

Q. 9. I have in my hand a printed copy of your deposition in said interference, which purports to have been taken on the 25th day of June, 1879. Was it the November or December before that, that you went into business in connection with the faucets?

A. It was.

Q. 10. How long did you continue to own an interest in that faucet manufacturing business?

A. I think about six or eight months.

Q. 11. To whom did you dispose of your interest?

A. To Mr. E. W. Chellis.

Q. 12. At the time when you first saw the talking-machines, about 1873, did you see any of the instruments now on the table before you? If so, please point out which.

A. I did, and saw this one, ["F,"] and this, ["C,"] and this ["B."] Those are all I saw the first time.

Q. 13. Do you remember whether Mr. Drawbaugh talked through the instruments at that time?

A. I can't give any definite time when he talked through any of these instruments, whether it was the first time or a short time after. The first time that he talked through them to me was shortly after I had any knowledge of his having a talking-machine, when he handed me an instrument similar to this [indicating, "A,"] which he directed me to place to my ear, stating that he would go down-stairs or in some other part of the building, and that I should listen. He went, and I heard Mr. Drawbaugh's voice asking me if I heard him talk. "Do you hear me talk?" was the way he put it. I was surprised and looked around, expecting to find Mr. Drawbaugh behind me, but did not find him. He came in presently and attempted to explain to me the principle on which the machine operated. I did not understand his explanation. He alluded to the vibration of a bee's wing to illustrate how the diaphragm operated to produce the sound. That is about all that I remember distinctly on that occasion. There was a great deal more said that I do not remember.

Q. 14. About how long do you think that was after he showed you the machines "B," "F," and "C"?

A. As I visited Mr. Drawbaugh's shop frequently, some weeks two or three times, I cannot state positively whether it was two days or two weeks thereafter. But I am positive that it could not have been one month thereafter.

Q. 15. From that time down to the time when you went into the faucet business with him, did you, from time to time, see other talking-machines in his shop?

A. I did.

Q. 16. Please look at the machines "D" and "E," now shown you, and state whether or not you recollect seeing them, or either of them, in his shop, and if so, give us your best recollection as to the time when you first saw them.

A. I did see an instrument of this kind, shape, or style. This one ["D"] looks like the one I saw. I cannot state positively the time, because I took so little interest in the machine that I only gave it a passing notice. I should have said, instead of the machine, the whole talking-machine business,—I took very little interest in it. I will sum the whole matter up in this way, in regard to seeing the different instruments. That I recognize nearly all the instruments on the table as those I saw in Mr. Drawbaugh's shop, from time to time, as I would be there, but cannot give any definite date as regards any of them, except the first three, and that is not very definite.

[*The examiner certifies that the instruments on the table at the time of the witness' answer are "A," "B," "C," "D," "E," "F," "G," "H," "I," "J," "K," "L," "M," "N," and "O."*]

[*The witness, after looking over the machines, continues:*]

I am not certain about having seen the instrument marked "J." I may have confounded that with the one that has the bell on, ["H,"] which I know I saw.

Q. 17. As you would be at his shop from time to time, from the time when you first saw the three talking-machines, "B," "F," and "C," down to the time when you were in the faucet business, would you, from time to time, see talking-machines or instruments that you had not seen at previous visits?

A. Yes, sir; I suppose so, because Mr. Drawbaugh would have something to say to me about his improvements and his talking-machine, and I remember that he showed me different forms of curved iron or steel on pieces of wood turned up, resembling this [holding up "D."] and also showed me one that he had improved what he had called the diaphragm, stating that he was making it of heavy metal, and showed me the machines from time to time with these improvements.

Q. 18. How heavy were the heaviest diaphragms that he showed you at any time or times?

A. I should say, at least ¼ of an inch, and of metal.

Q. 19. Did you ever hear him talk through the machines that had the heavy diaphragms?

A. No, sir.

Q. 20. Was Mr. Drawbaugh doing any work on his talking-machines during the time when you were connected with the faucet business?

A. Yes, sir; our trouble was to keep him away from it.

Q. 21. Were you at his shop frequently when the Electric Clock Company of Messrs. Shettel & Grissinger were manufacturing Electric Clocks there?

A. Yes, sir.

Q. 22. Did you see him doing any work on his talking-machines at any time or times while said Clock Company were carrying on their business there?

A. Yes, sir; but what particular part of the machines I could not say. I saw a machine—I think he called it a transmitter—made in the shape of a funnel, of paper, with threads passing through from one wall to another. That was while the clock company was in operation, and was one of the last things I saw him working on that I can describe.

The reason I remember that is, that he wanted me to go in with him to get it patented and get it into use.

Q. 23. When did Mr. Drawbaugh first ask you to go in with him and furnish means for getting the talking-machine patented and introduced into use; and if he asked you more than once, how often after the first time did he ask you to do so?

A. Considerable time before I went into the faucet business he asked me to go into the talking-machine. It was before the Centennial year, and on nearly every occasion we would meet, he would try to induce me to go in, and ask me if I had not enough money, to try and get some other person to go in with him.

Q. 24. Why did you finally decide to go into the faucet, rather than the talking-machine?

A. Because I understood the faucet business better than the talking-machine, and having asked Mr. Cheilis what he thought of the talking-machine as a speculative enterprise, he discouraged it, and encouraged the faucet business, because, as he stated, there was more prospect of making money out of it—the faucet—in a short time than out of the talking-machine.

Q. 25. When Mr. Drawbaugh first asked you to go into the talking-machine with him, had you heard it talk, and did you know that it would operate as he claimed for it?

A. I heard it talk, but, up to the time that I went into the faucet business, looked upon it more as a toy, or matter of amusement, than an instrument of any utility.

Q. 26. Did not you, during those years, think there was any money to be made out of invention by which a person could talk from one place to another, instead of telegraphing?

A. I did, towards or during the latter part of the time; but, I suppose, from my knowledge of telegraphing, that I did not put the telephone, or talking-machine, in its stead. In other words, it never occurred to me that the thing would ever amount to anything as a telegraph. At an early stage of the proceedings, I had seen at Mr. Drawbaugh's shop a dial telegraph, with letters around the dial, to spell out the words. This was to be worked entirely with magnets, without a battery. This was one of the things that made me think that the talking-machine would not amount to much as a speculation.

Q. 27. When did Mr. Drawbaugh invent the faucet that you became interested in?

A. As near as I can remember, in the year 1869 or 1870. In one of those years; the exact time I cannot remember.

Cross examined by Mr. Storrow:

Cross-Q 28. How long before you went into the faucet business did you have the conversation with Mr. Chellis about the relative merits of the talking machine and faucet?

A. As near as I can remember, a month or two.

Cross-Q. 29. Your conversation must have been somewhere in the fall of 1878, I suppose?

A. I think so.

Cross-Q. 30. Did he tell you why he thought there was more prospect, &c., as you have stated?

A. Yes, sir; I remember that one of the leading points he stated was that the telephone was already in use, and that Dan would have a hard time to establish his claim on it, and that there would be more money in the faucet than in the telephone business. His meaning was that Drawbaugh would have to establish priority of invention, &c.

Cross-Q. 31. Did you and Mr. Chellis go into this faucet business as partners together, and at the same time?

A. Yes, sir; with Mr. Drawbaugh, one third interest each.

Cross-Q. 32. Did you ever have one of Drawbaugh's electric clocks?

A. I had one in my house.

Cross-Q. 33. When?

A. I lived on Market street at the time. It was while the clock company was in operation. I think it was in 1878.

Cross-Q. 34. Did it ever trouble you by stopping and not keeping good time?

A. No, sir.

Cross-Q. 35. Did it always keep good time and not stop?

A. No, sir; it did not always keep good time.

Cross-Q. 36. Did it always keep going?

A. Yes, sir.

Cross-Q. 37. Did you ever make any complaint about it to the company or to Mr. Drawbaugh?

A. Yes, sir; I did.

Cross-Q. 38. Did you ever complain of it more than once?

[*Mr. Hill says, that not being able to see what this line of cross-examina-*

tion has to do with talking machines, he objects to it as immaterial and irrelevant.]

A. I don't remember. I remember of one time.

Cross-Q. 39. Whom did you buy it of?

A. No one.

Cross-Q. 40. Do you mean that you only borrowed it?

A. Neither one. I did not own it, nor I did not buy it, nor I did not borrow it.

Cross Q. 41. How did it come into your possession?

A. It was put there by the Company with my permission.

Cross-Q. 42. Did you tell them that they must come and make it go better, or come and take it away?

A. I don't remember. I wrote to one of the Company—not to Drawbaugh—that if the clock did not run better, they must take it away.

Cross-Q. 43. Did Drawbaugh or any of the Company come over to see you, in consequence of that complaint?

A. Mr. Shettel came to see me.

Cross-Q. 44. Did not Mr. Drawbaugh come, too?

A. Mr. Drawbaugh did not come at that time.

Cross-Q. 45. Did he come alone to see you about it, on a different day?

A. He came alone one time. I don't remember whether it was at that time, or on that call, or not.

Cross-Q. 46. Please look at your fourth answer, and tell me what are the inventions there referred to.

A. Various inventions. I could not state which ones. I was interested in almost any mechanical pursuit the man was working at, being inclined that way myself, to some extent.

[*Mr. Hill renews his objection to the cross-examination about the clock.*]

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 2d day of June, 1881.

FRED. M. OTT,
Examiner.

JOHN W. MOFFITT.

Adjourned until June 3d, 1881, at 10 o'clock, A. M.

Friday, June 3, 1881, 10 *o'clock*, A. M.

Examination resumed, pursuant to adjournment.

Present, Mr. Storrow for complainants, and Mr. Hill and Mr. Jacobs for respondents.

Recess for dinner until 1.30, P. M.

1.30, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

CHARLES L. DRAWBAUGH, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. Twenty-six; residence, Todd, Huntingdon county, Penna.; occupation, lumber business.

Q. 2. Are you a son of Henry F. Drawbaugh, who testified a few days ago in this cause?

A. Yes, sir.

Q. 3. How long have you lived at Todd, and how far is it from Eberly's Mills?

A. I have been there one week next Monday.

Q. 4. Where did you live just before that?

A. At Three Springs, Huntingdon county.

Q. 5. How far is Three Springs from Eberly's Mills?

A. About one hundred and eight miles, and Todd is one hundred and eighteen miles from Harrisburg.

Q. 6. How long did you live at Three Springs?

A. I moved to Three Springs about the last of January, 1881.

Q. 7. Where did you live before that?

A. At Newville, Cumberland county, in the same town with my father, but not in his family since April, 1878. Before that time, I lived in my father's family. Newville is twenty-eight miles from Eberly's Mills.

Q. 8. Your father testified that he commenced running a line of market cars on the railroad, about May 1, 1876, and run them until the summer of 1878. Were you employed on that line of cars while he run them?

A. Yes, sir.

Q. 9. Prior to that time, had you ever heard your uncle, Daniel Drawbaugh, say anything to you about his talking-machines? If so, how long before you commenced running the cars did you first hear him say anything about them, and what did he say, to the best of your recollection, the first time?

A. Yes, sir; to the best of my recollection, it may have been a year, and it may have been three or four years before we commenced running the cars. I can't just recollect. I understood him to say that he had a machine to talk to a distance. I understood that it was to work pretty much like telegraphing. I can't recollect that he showed me the machines at that time.

Q. 10. When do you recollect first seeing his talking-machine, and who showed it to you?

A. It was some time before we commenced running cars. I can't tell exactly how long. It may have been a year, and it may have been two or three years. It was shown to me by my cousin, Harman K. Drawbaugh, at my uncle's shop.

Q. 11. Did Harman talk through the machine to you at that time?

A. Yes, sir.

Q. 12. Explain what floors you and Harman were on while he was talking and you were listening to the machine.

A. I was on the first floor, and he was above me somewheres, but I don't recollect just exactly where he was; he was on a floor above.

Q. 13. Did you hear and understand through the machine what was said?

A. Yes, sir.

Cross-examined by Mr. Storrow:

Cross-Q. 14. Were you ever at your uncle's shop on any other occasion?

A. Yes, sir; I was there quite a number of times; I could not say how often.

Re-direct by Mr. Hill:

Q. Q. 15. How many times do you think you were there during the three years before you commenced running the cars?

A. I may have been there three or four times, or I may have been there more; I can't tell exactly. I may not have been there that many times.

Q. Q. 16. How many times were you there during the two years and a quarter that you were running the cars?

A. I was there three or four times, and may be oftener; I can't tell.

Q. Q. 17. How many times have you been there since you stopped running the cars?

A. I think it was but once, if I recollect right. I think it was about January, 1880.

Q. Q. 18. Did you ever hear your uncle say anything more about talking-machines after that first conversation?

A. I think the last time that I was down at his place he was talking about it. I can't recollect what it was that he said. I can't recollect whether or not I heard him say anything about it between the first conversation and the one last mentioned. I never took much interest in it.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 3d day of June, 1881.
FRED. M. OTT,
Examiner.

C. L. DRAWBAUGH.

Adjourned by consent of both parties until Monday, June 27th, at two o'clock, P. M.

Monday, June 27, 1881, 2 *o'clock,* P. M.

Examination resumed, pursuant to adjournment.

Present, Mr. Hill and Mr. Jacobs for respondents, and Mr. Storrow for complainants.

DANIEL C. JONES, *being produced, sworn, and examined, saith:*

Examined by Mr. Hill:

Q. 1. State your age, residence, and occupation.

A. Age, thirty-one; residence, 110 Buttonwood avenue, Harrisburg; occupation, clerking for Mr. Knisely, in the hat business.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pa.? If so, how long have you known him?

A. I do; I got acquainted with him in 1870.

Q. 3. Did you at one time live at or near Milltown, or Eberly's Mills, Cumberland county, Penna.? If so, when did you commence to live there, and to what time did you continue to live there?

A. I moved there in the spring of 1870, and left in the spring of 1871.

Q. 4. During the time that you lived there, were you ever in Daniel Drawbaugh's shop? If so, how often?

A. I was there a great many times; I can't tell the exact amount of times.

Q. 5. Have you ever been in that shop since you moved away from Milltown, in 1871?

A. No, sir.

Q. 6. When you were in that shop, during the time when you lived there, did you see any talking-machine, or talking-machines, there?

A. I saw a machine there. I was told it was a talking-machine.

Q. 7. State how you came to see it there, and what was said about it at the time.

A. I had been looking around the shop and seen something that resembled this very much, [indicating "B,"] and I asked what it was Harman Drawbaugh told me it was a talking-machine.

Q. 8. Did you talk through it, or hear anybody talk through it?

A. No, sir; I did not.

Cross-examined by Mr. Storrow:

Cross-Q. 9. Whose house did you live in?

A. Mr. Martin Best's; my father farmed Mr. Best's farm one year.

Cross-Q. 10. Who run the grist-mill while you were there?

A. Mr. Leonard.

Cross-Q. 11. Who had the blacksmith-shop then?

A. Mr. Fettrow.

Cross-Q. 12. Who kept the store?

A. Mr. Kissinger.

Cross-Q. 13. Who had the post-office?

A. Mr. Kissinger; the post-office was in the store.

Cross-Q. 14. Where did you go when you left there?

A. From there we moved to York county, back of Lewisberry.

Cross-Q. 15. How long did you live in Lewisberry?

A. We moved there April 1st, and left the first of the following March.

Cross-Q. 16. How far is it from Lewisberry to Newberry?

A. I can't tell you that distance.

Re-direct by Mr. Hill:

Q. Q. 17. State whether or not Harman Drawbaugh had recently returned from the West at the time when you saw the machine which he told you was a talking-machine.

A. He had returned some time before that. It might have been about two months, as near as I can tell.

Re-cross by Mr. Storrow:

Re-cross-Q. 18. What work was going on at Mr. Drawbaugh's shop at the time you refer to?

A. There was no one working in his shop, that I recollect of, except himself.

Re-cross-Q. 19. What house did he live in at that time?

A. He lived in what we called the corner house, a kind of a double house, next to the blacksmith shop. He and Fettrow lived in the same house.

Re-cross-Q. 20. Did you ever talk with anybody, outside of Drawbaugh's shop, about the talking-machine, or did you ever mention it to anybody while you lived there?

A. I don't remember of ever hearing anything outside, nor of ever mentioning it to anybody.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 27th day of June, 1881.
FRED. M. OTT,
Examiner.

DAN'L C. JONES.

Adjourned until June 28th, at 10 o'clock, A. M.

June 28th, 1881, 10, A. M.

Examination resumed, pursuant to adjournment.

Present, Mr. Storrow for complainants, and Mr. Hill and Mr. Jacobs for respondents.

DAVID H. GOOD, *being produced, sworn, and examined, saith:*

Examined by Mr. Hill:

My age is forty one years; residence, Yocumtown, York county, Pa.; occupation, merchant. I am acquainted with Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pa. I learned to know him in 1867.

Q. 1. How long have you lived at Yocumtown?

A. I moved there in the fall of 1870.

Q. 2. Before you moved there, where were you doing business and residing for several years?

A. At Eberly's Mills.

Q. 3. From what time to what time did you reside at Eberly's Mills?

A. From the spring of 1867 to the fall of 1870 I resided there, and did business there as a merchant.

Q. 4. While you resided there, did you at any time have any conversation with Daniel Drawbaugh with reference to his talking-machine? If so, what was the conversation, and when was it?

A. No, not individually, but heard some. In the fall of 1868 I heard him tell two men in my presence that he had a machine that he could convey sound or talk as plain as he was talking now. Then he went on, of course, with a great rigamarole, that he had experimented. He did not just say what distance, but that he could talk at a distance, or hear.

Q. 5. What kind of a store did you keep at Eberly's Mills, while you lived there?

A. What is called a general store. Everything to suit farmers, outside of farming implements.

Q. 6 Did Mr. Drawbaugh or his family trade at your store?

A. Yes, sir; they were regular customers.

Q. 7. So far as you had any knowledge, what was his financial condition during that time?

A. Very limited. His means were very limited.

Q. 8. Did you have any difficulty in collecting accounts from him?

A. Yes, sir.

Q. 9. When you gave up business there and moved away, had he settled and paid you in full, or did you leave him still owing you?

A. I left him still owing me. I took his note for balance due, amounting to sixty-four dollars.

Q. 10. How long was it before you collected the note?

A. The last payment, I think, was made in 1873. He paid it in different installments.

Q. 11. Did you finally get a judgment on the balance due on the note?

A. Yes, sir.

Q. 12. What was Drawbaugh's general reputation, in the community there, for honesty?

A. It was good.

Cross-examined by Mr. Storrow:

Cross-Q. 13. Did this conversation, that you have spoken of, take place in your store?

A. Yes, sir.

Cross-Q. 14. Who were the two men?

A. Mr. Hart and Mr. Dittlow, if my memory serves me right. I would not be positive as to Mr. Dittlow.

Cross-Q. 15. When you heard him say that he had got a machine that would do what you have stated he said it would do, I suppose you believed, right off, that he had got such a machine, and that it would do it, did not you?

A. I had every reason to believe it.

Cross-Q. 16. What do you mean by "every reason?"

A. I never knowed him to say anything of the kind but what he brought to perfection, in the way of machinery and invention.

Cross-Q. 17. Did not it strike you as rather a startling kind of machine, if it could do what he said it could do?

A. Yes, sir.

Cross-Q. 18. And, notwithstanding that, you were ready to believe, right off, that he had invented and made such a machine, just because you heard him say so to two men in your store; is that so?

A. Yes, sir.

Cross-Q. 19. Do you think that the most of people who knew him in that community were disposed to accept his remarks about his own inventions with the same confidence?

A. To a great extent.

Cross-Q. 20. I wish you would tell me everything else you know personally, or that you have ever heard him say, about any talking-machine.

A. He said he could greatly improve it from what he had. I never heard anything afterwards, I believe.

Cross-Q. 21. Was this remark in your last answer made on the same occasion that you have already testified about?

A. Yes, sir.

Cross-Q. 22. Was he looked upon, by you and others, as a man who could invent most anything?

A. He was.

Cross-Q. 23. What other things did he ever invent?

A. A stave-cutter, faucet, clock, and some other arrangements that I don't know the name of. I saw the patterns, but I don't know the name of them.

Cross-Q. 24. Where did you see the patterns?

A. At his shop.

Cross-Q. 25. He had quite a garret-full, at his shop, of models and patterns, and things that he had made and experimented with, did not he?

A. Yes, sir.

Cross-Q. 26. Who took the store when you left?

A. No one, that fall.

Cross-Q. 27. Did you move away your stock, or sell it out?

A. I moved my stock.

Re-direct by Mr. Hill:

Q. Q. 28. Do you remember who kept store there next, after you left?

A. Kissinger.

Re-cross by Mr. Storrow:

Re-cross-Q. 29 Please to tell me the names of the householders at Eberly's Mills, while you kept store there.

A. Christian Eberly, John Beetem, John W. Drawbaugh, Daniel Drawbaugh, George B. Heck, William Heck. That is all I can recollect in the town. Most of the houses were owned by the company there, Beetem & Eberly.

Re-cross-Q. 30. Who was the blacksmith at that time?

A. Daniel Fettrow.

Re-cross-Q. 31. Who was the postmaster?

A. George B. Heck.

Re-cross-Q. 32. Who carried the mail?

A. David H. Good.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 28th day of June, 1881.

FRED. M. OTT,
Examiner.

DAVID H. GOOD.

Adjourned until 2, P. M.

2 *o'clock*, P. M.

Mr. Storrow only appeared, and at three o'clock, the counsel for the respondents not appearing, or not producing any witnesses, examination adjourned until the 29th instant, at 10, A. M.

June 29, 1881.

Examination resumed, pursuant to adjournment, at 10.20 o'clock, A. M.

Present, Mr. Hill and Mr. Jacobs for respondents, and Mr. Storrow for complainants.

[*Mr. Hill states, in explanation of the delay yesterday afternoon, that it was caused by the non-attendance of witnesses, who had been sent for and were expected to be here.*]

D. E. BYERS, *being produced, sworn, and examined, saith:*

Examined by Mr. Hill:

My age is twenty-seven; I reside in Newville, Cumberland county, Pa.; occupation, railroad agent and telegraph operator.

Q. 1. Do you know Henry F. Drawbaugh, of Newville, Cumberland county, Pa.? If so, how long have you known him?

A. I have known him ever since I can remember anything. I suppose twenty years.

Q. 2. How long have you been engaged in the business in which you are now employed—telegraph operating?

A. Since 1869.

Q. 3. Have you any recollection of Henry F. Drawbaugh asking your opinion, a good many years ago, of a talking-machine, which he told you his brother had invented?

A. Yes, sir.

Q. 4. To the best of your recollection, about how long ago would you say that conversation occurred?

A. I would say, to the best of my recollection, it would be six or eight years. I can't get at it any nearer than that.

Q. 5 Was it, or was it not, several years before you ever heard or read of the invention or introduction of electric telephones?

A. Yes, sir.

Q. 6. When Mr. Henry F. Drawbaugh spoke about it to you, as you have testified, did you encourage, or discourage, him about it?

A. My recollection is that I discouraged him.

[*Mr. Hill here reads over question and answer* 111, *in the deposition of Henry F. Drawbaugh, printed on page* 411 *of* "*Defendants' Record,*" *and asks the witness:*]

Q. 7. What is your recollection of the conversation with Henry F. Drawbaugh, and how far does it agree, or disagree with the testimony that I have just read to you?

[*Counsel for complainants objects to the reading of the testimony before it is read, and to the question as leading and incompetent.*]

A. It might have been that that is the conversation that took place. It has been so long ago that I don't remember the exact words, but remember of laughing at the idea of such an invention.

Cross-examination waived by Mr. Storrow.

D. E. BYERS.

Recess until 11.30, A. M.

June 29, 12, M.

Examination resumed.

GEORGE BRICKER, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

My age is sixty-two; residence, Newville, Cumberland county, Pa.; occupation, none at present. I am acquainted with Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pa., and have known him for twenty-five or thirty years.

Q. 1. If you ever had any knowledge of his working upon a talking-machine, please give us a full statement of all the knowledge that you had about it, together with the dates, as near as you can fix them.

A. The first knowledge I had of it was during the fall of 1870. My information I got here in Harrisburg, from Mr. Winters, on South Second street, (liquor merchant, I think he is,) and Mr. Brandt, who was a drygoods merchant in the square. Mr. Drawbaugh, not Daniel, but some relation, father-in-law of Mr. Brandt, was also present. The three were together. That was my first intimation—through those parties—of Mr. Daniel Drawbaugh working upon this machine. I don't remember what they called it. The purpose for which it was intended was to convey sound to a distance. My recollection is indistinct as to whether it was the sound of the voice, but is distinct as to its conveying sound by electricity, if he had a mind to. Through this information, at the time, before I left the place here to go to my home, I went out to his place of residence to see it. When I went there I found he was away, and I did not see it. After that I met him again at a time that I fix as some time during the year 1870 or 1871, and had a conversation with, or rather I asked him the question, when I met him, and told him about my being there. I then asked him how he got along with his machine that he was working on. I mean this machine that we speak of. He said the trouble with him not making more progress was owing to his not having any money to go on and complete it as fast as he would like to, and having no one to assist. He told me that outside people looked upon or considered him crazy, or something like that, and were not willing to assist him with money to complete his invention. That is the last that I recollect of meeting him, and having any conversation with regard to this machine.

Cross-examined by Mr. Storrow:

Cross-Q. 2. Was he working upon other machines, and getting up and experimenting upon other inventions?

[*Objected to, and the magistrate is requested to instruct the witness to answer from his own knowledge, and not from hearsay.*]

A. I don't know that he was.

Cross-Q. 3. Did not you understand that he was?

[*Objected to as above.*]

A. I have no knowledge that he was working upon any other machine, or any other machines, that he had patented, or intended to.

Cross-Q. 4. Did not you understand that he was working upon other machines?

[*Objected to as hearsay, and as immaterial and incompetent.*]

A. I did not. He never told me that he was, and I have no knowledge of his working on any. He might have been, but he never told me.

Cross-Q. 5. Did not you hear that he was, and did not you believe that he was, working upon other machines and inventions?

[*Same objections.*]

A. I never heard and never thought that he was. I had no knowledge that he was. He might have been, but I have no knowledge of it.

Cross-Q. 6. Do you mean to say that you knew Daniel Drawbaugh twenty-five or thirty years, and never heard, or never thought, that he was working on any machines or inventions, except the alleged machines you spoke of in your direct examination?

[*Objected to as assuming that the witness's testimony covered a period of twenty-five or thirty years, whereas, on the contrary, the witness expressly stated that it covered only the years* 1870 *and* 1871, *and, so far as the cross-examination goes, outside of those two years, it is further objected to as irrelevant to the subject-matter of the direct examination.*]

A. I will answer it in this way—that I should not have known about this, had not my attention been drawn to it in this way by these men.

Cross-Q. 7. Is that the best answer you can give?

[*Same objections.*]

A. That is the best one I can give.

Cross-Q. 8. In your direct testimony, you say: "I then asked him how he got along with his machine that he was working on." After saying that, you added: "That is not definite, because he was working on a good many machines," did you not?

A. I don't have any knowledge of saying that he was working on a good many machines.

Cross-Q. 9. Did you not say that he was working on other machines?

A. No; any time he was talking to me, it was about this one machine that these men got me to go out to see, and when I talked to him about how he was getting along, I had only reference to this particular one.

Cross-Q. 10. So you mean to leave it, that, during all the years you knew him, you never heard of him working on any machine, except this alleged machine, do you?

[*Same objection as to cross-question* 6.]

A. Yes, sir.

Cross-Q. 11. You never saw this alleged machine to convey sound, did you?

A. I did not.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 29th day of June, 1881.
FRED. M. OTT,
Examiner.

GEO. BRICKER, SR.

Recess for dinner until 2, P. M.

June 29 2.30 *o'clock*, P. M.

Examination resumed, pursuant to adjournment.

Present, Mr. Hill and Mr. Jacobs for respondents, and Mr. Storrow for complainants.

HENRY SNYDER, *being produced, sworn, and examined, saith:*

Examined by Mr. Hill:

My age is sixty years; I am a grain and commission merchant. I have lived for a year past at Jacksonville, about four miles from Newville, Cumberland county, Pa.; that is, I am doing business there, but have not moved my family yet.

Q. 1. Do you know Henry F. Drawbaugh, of Newville.

A. I do.

Q. 2–3. State whether or not Henry F. Drawbaugh ever applied to you to go in and furnish money for patenting and introducing upon the market a talking-machine, invented by his brother Daniel; if so, tell us all about the matter—what was said and done, and when.

A. He did. I can't fix the date as 1872, '3, or '4, exactly. I think it was in the year 1872 or 1873, that Harry F. Drawbaugh came to my place of business in Newville and asked me if I would not go into an enterprise with his brother Daniel, or furnish him money, in a project or enterprise that was an entirely new thing—perhaps never heard of; that it was a machine, as he called it, for talking. I asked Harry, Dan's brother, what the object or intent of it was. Harry said that it was intended to establish a patent, what he believed, on the talking-machine, and that it required a good deal of money to procure different kinds of machinery, as well as his own labor and time connected with it, and that he himself was too poor to carry the project or enterprise to a successful issue, or something equivalent. That may have been all that occurred between Harry and I at that time. He may have come to me as often as a half a dozen different times, and still insisted that I should go in with Dan and furnish him the money; that he was too poor to carry it on much longer himself. I asked Harry why he would not try and get a man of mechanical genius that could assist him, that I could be of no advantage to him, only in the money matter. Harry assured me that it was nothing but the money alone that was wanting. That he had within himself all the knowledge that was requisite to establish the talking-machine he intended to put into use; and that, unless he could obtain a patent, all his time and labor would be spent or lost in vain. I, however, declined giving them any assistance, having no knowledge or idea of what he intended to establish or accomplish, and upon these facts I based my objections.

Q. 4. Do you mean to be understood that Harry came to you different times, perhaps a half dozen times, about this matter?

A. I expressed it so; that is what I meant.

Q. 5. The first time that he came to you, you say was in 1872, '3, or '4. About what year would you fix as the last time Harry spoke to you on the subject?

A. Not later than 1875. My intercourse and acquaintance with the Drawbaugh family has been so common and familiar that I could not state the time as positive as I might have done with a stranger.

Q. 6. When Harry was urging you to go in with his brother in this enterprise, did he tell you that the machine had been made to operate, so as to talk from one place to another, or not?

[*Objected to as hearsay.*]

A. At every interview, after the first, Harry still told me that the facts of his machine was becoming more evident every time that he saw or talked with his brother Dan. I mean, that he considered that he was still meeting with more and more success in it, and he said that, from the first to the last, it would prove a full and successful talking-machine, and that his only drawback was the want of funds to bring it before the public.

Q. 7. Am I to understand that the proposition that he urged upon you, from time to time, included the patenting of the machine and the manufacture of it, and its introduction upon the market?

A. Yes; that was the understanding, that all the expenses incumbent upon the patenting, manufacturing, and all other machineries was to be included in the bill of expenses, to bring it before the public, or to put it into use. By all other machineries, I mean machinery for manufacturing it, or models, or anything of that kind.

Q. 8. What was offered to you as a consideration for putting the money into it?

A. The half interest.

Q. 9. Did you study over the matter and make up in your own mind an estimate of the money that would be required to get a patent and introduce the patent into public use?

A. I did, but only within myself.

Q. 10. If you remember what your estimate was, please state it.

A. My estimate was not less than five thousand dollars, and not more than ten thousand.

Q. 11. Did you have knowledge at that time that Mr. Daniel Drawbaugh, who would be your partner in the business if you went in, was quite heavily indebted and financially involved?

[*Objected to as leading and assuming.*]

A. I knew nothing of his indebtedness, but knew he was born of poor parentage, or rather poor, I would say. I knew nothing about his means, except what his brother told me.

Q. 12. Did Harry tell you at the time that Daniel was in debt?

[*Same objection.*]

A. He did not, but it was so evident upon my mind that I knew it was the fact.

[*Answer objected to for the same reason.*]

Q. 13. From what you know of his brother's circumstances, you were satisfied that it was the fact, although you did not actually know; is that what you mean?

[*Objected to as leading, as assuming, and as incompetent in view of the previous testimony of the witness.*]

A. Yes, sir.

Q. 14. Did that fact, or what you believed to be the fact, have any share of influence in leading you to decline the proposition to go in with him in the proposed enterprise?

[*Same objection.*]

A. It had, because I did not believe that he had one dollar to give towards the expenses in getting the machine completed.

Cross-examined by Mr. Storrow:

Cross-Q. 15. I understand that the proposition made to you was that you should furnish all the money, and in pay for that, should take the half interest; is that so?

A. Yes, that was my understanding.

Examination taken, reduced to
writing, and by the witness sworn
and subscribed to before me, this
29th day of June, 1881.
FRED. M. OTT,
Examiner.

HENRY SNYDER.

Adjourned at 3.45, P. M., until 10, A. M., June 30th.

June 30th, 10.30, A. M.

Examination resumed pursuant to adjournment.

Present, Mr. Hill and Mr. Jacobs for respondents, and Mr. Storrow for complainants.

DAVID K. ERNST, *being produced, sworn, and examined, saith:*

Examined by Mr. Hill:

My age is about thirty-three; my post-office address is Newville, Cumberland county, Pa.; I don't live quite at Newville; my occupation is farmer. I know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pa. I have known him ever since I know anybody. I was raised in the town where he lives.

Q. 1. How long have you lived at Newville, and how far is it from Eberly's Mills, or Milltown?

A. I live at the same place I live now for almost fourteen years. It is about twenty-six miles from Eberly's Mills, to drive it, and it is a little farther by rail, as we live a little this side of Newville, and go there to get off.

Q. 2. Do you recollect the circumstance of your visiting Daniel Drawbaugh's shop, at Eberly's Mills, some years ago, for the purpose of purchasing a pump?

A. I do; yes, sir.

Q. 3. Who went with you on that visit?

A. Mr. John Bloser, the gentleman who is here present.

Q. 4. State when that visit occurred—that is, what year, and what time of the year, as near as you can fix it.

A. The year was 1872. It was in the beginning of haymaking, before the grain was cut. I think it was about the middle of June. They were just commencing to cut hay. The way I fix the year is, that I wanted some one to come with me to the lower end of the county, as we call it, and I asked Mr. Bloser to come with me, and he told me he had hardly time; he would have to haul sand and lime, and tend the plasterer, who was intending to plaster his father's house then, or shortly. I told him to come along with me and I would help him haul the sand and lime when we came back. We did so, and we hauled it just at the beginning of grain-cutting; and by different reasons we know that the house was plastered in 1872. There had been an end built to the house, and the old part remodeled in that year. The work was begun in the fall of 1871, and completed in the summer of 1872.

Q. 5. While you were at Mr. Drawbaugh's shop on that occasion, was anything said, or done, about a talking-machine? If so, what?

A. Yes, sir; there was. Mr. Drawbaugh spoke to me about his talking-machine. I asked him, when we went there, to show us his things—machinery—and he showed us quite a number of things. Among them was a dial telegraph, which we operated a little on. I thought it a very nice machine. I asked him why he did not go on and finish that. I thought there was money in it. Oh, he said he was working at something better, which he called a talking-machine. I could not say positive that he showed us the machine, although I rather think he did. I saw some of the pieces this morning in Mr. Jacobs' office, and they looked natural to me, but I could not positively identify them. The ones that I refer to as seen this morning were a glass tumbler and a green tin can.

Cross-examined by Mr. Storrow:

Cross-Q. 6. Did you buy a pump from Mr. Drawbaugh on that visit?

A. I would answer that by saying I did not get the pump at that time. I gave him the length of the pipe, and my brother-in-law brought it up afterwards.

Cross-Q. 7. Why did you happen to go to Drawbaugh's shop to buy a pump?

A. Mr. Drawbaugh owed my father an account, and we thought the pump would be paid on that account.

Cross-Q. 8. Did he make these pumps?

A. He patented them. I could not say who made them. I can't say what name they were known by at all.

Cross-Q. 9. Who did you hear of these pumps from?

A. The way I would answer that question, would take a little longer time to answer it, is this: There was an uncle of mine, George Shettel, from Shepherdstown, bought a pump of Drawbaugh—a patent pump. We intended to get one of that kind, and he told us this kind was better and cheaper. Dan Drawbaugh told us this. I think they called it an air pump, or something. I mean that is the kind Shettel had.

Re-direct by Mr. Hill:

Q. Q. 10. In your eighth cross-answer, you say "he patented them." Do you know this to be a fact, or is it only your understanding?

A. It is my only understanding by parties telling me, who worked in the shop.

Examination taken, reduced
writing, and by the witness sworn
and subscribed to before me, this
30th day of June, 1881.
FRED. M. OTT,
Examiner.

D. K. ERNST.

JOHN BLOSER, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

My age is thirty-three; I live in West Pennsboro' township, Cumberland county, Pa.; my post-office address is Newville; my occupation is that of a carpenter.

Q. 1. You have been present, and heard the testimony just given by Mr. Ernst, have you not?

A. I have.

Q. 2. Do you remember the trip to Daniel Drawbaugh's shop, about which he testified?

A. I do.

Q. 3. State whether, or not, the account which Mr. Ernst has given of that trip, and of what occurred at Mr. Drawbaugh's shop, substantially coincides with your recollection?

A. I don't remember quite as much as he has said. I remember going there. I don't know that I can say anything about what occurred in the shop. I remember being in there, and saw quite a number of things there. The impression on my memory is, that he, Drawbaugh, spoke about the talking-machine.

Q. 4. In what year was that trip, and at what time of the year, and how do you fix the time?

A. My recollection is, that it was in 1872, about the middle of June. He spoke about the building that was going on. I think the circumstances would be almost the same as those mentioned by Mr. Ernst. I was in school the summer of 1871, before harvest. The plastering of the house was done about the time that Mr. Ernst states. I was teaching school in the fall and winter of 1871, and finished in the spring of 1872; the house was finished and ready for plastering in the spring of 1872. I

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remember seeing some grass being cut as we were on our way home from our trip.

Cross-examination waived by Mr. Storrow.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to, this 30th day of June, 1881.

FRED. M. OTT,
Examiner.

JOHN BLOSER.

11.45, A. M., June 30th, no more witnesses being at hand, adjourned until 2.30, P. M.

June 30th, 2.40, P. M.

Examination resumed, pursuant to adjournment.

Present, Mr. Hill and Mr. Jacobs for respondents, and Mr. Storrow for complainants.

JAMES A. SMITH, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

I am fifty-four years old; I reside at New Cumberland, Cumberland county, Pa.; I am Postmaster.

Q. 1–2. Did you formerly live at Milltown, Cumberland county, Pa.?

A. Yes, sir.

Q. 3. When did you commence to live there?

A. I moved there on the 18th or 19th of March, 1866.

Q. 4. How long did you live there?

A. I am not positive whether it was in the fall—it was late in the fall, I think, of 1867, when I moved away.

Q. 5. What was your business at Milltown?

A. I was miller there; I ran the mill.

Q. 6. While you lived there, did you know Daniel Drawbaugh, of Eberly's Mills?

A. I did.

Q. 7. Will you please to relate a conversation, that you had with Daniel Drawbaugh, at your mill, while you lived there, on the subject of the telegraph?

A. Early in the spring of 1867 Daniel Drawbaugh came into the mill office and had in his hand a copy of the *Scientific American*, on which there was small black spaces, I could not tell exactly the size, represented as streaks or rays of light striking out from a centre. We began—I don't know how the conversation began—talking about electricity. I thought this was something on electricity. From this we began to talk about the telegraph—led into a conversation about the telegraph, and Mr. Drawbaugh remarked that the telegraph would be yet superseded, and men would talk audibly as face to face at any distance, saying at the same time that he was experimenting. I asked him at the time if he thought so, when he remarked: "I am confident of it." I don't remember of any other conversation until within three days of that time—it might have been the next day—in his shop, when he told me that he and his daughter—I forget her name—but he says Emmy, had talked together, and that there was a floor and two partitions between them. At this time he did not tell me by what means they had conversed, but it made the impression on my mind that it was by a wire, but he did not say that. I don't know what made the impression, but that was the impression on my mind, that it was a wire. The daughter, to whom Mr. Drawbaugh referred, is now dead. I do not remember her name, but it was his oldest daughter.

Q. 8. Did Mr. Drawbaugh ever show you one of his talking-machines?

A. No, sir; he told me one time to come and see it, that he had it all right now, but I had not time, and did not go.

Cross-examined by Mr. Storrow:

Cross-Q. 9. Have you ever been at Drawbaugh's shop since you moved away from Eberly's Mills?

A. Yes, sir; I have. I think I have been there twice.

Cross-Q. 10. Were those visits soon after you moved away, or recently?

A. The first time was soon after he had got to making faucets in the old mill, where he is now. I can't tell you when the second time was. I suppose he was in the old mill three or four or more years when I made that visit. I can't give you any idea of that; it may have been more, and it may have been less.

Cross-Q. 11. Then the talk with him, which you have testified about, was when he had a shop by the grist mill, and before he had moved down to the old mill where they made the faucets, was not it?

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A. Yes, sir: that was the first two conversations, and the conversation when he told me that he had the machine all right, was after he had moved down to the lower shop where he made the faucets?

Re-direct by Mr. Hill:

Q. Q. 12. Was this last conversation, when he told you he had the thing all right, at the last time you visited the shop?

A. Yes, sir; at the last time I visited the shop. In the first conversation at the other shop, I should have also stated that he said, "Hang it," if he only could get somebody to assist him—in the way of money he meant—but he was not able to carry it through himself. He said that men were afraid to risk any money in a thing that had a patent right about it. He said, if some person would lend him money he could make a good thing for himself, and the one who would assist him.

Re-cross.:

Re-cross-Q. 13. I call your attention to the occasion when he said he had got the machine ready to show you, and asked you to come and see it; was that while you lived at Eberly's Mills?

A. No, sir. He says, " I have it all right." That was the remark he made.

Re-cross-Q. 14. Was that while you lived at Eberly's Mills, or after you moved away?

A. It was after I moved away.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 30th day of June, 1881.
FRED. M. OTT,
Examiner.

JAMES A. SMITH.

For want of witnesses, adjourned at 3.45, P. M., until July 1st, at 10 A. M.

July 1, 1881, 10.45, A. M.

Examination resumed, pursuant to adjournment.

Present, Mr. Hill and Mr. Jacobs, for respondents, and Mr. Storrow for complainants.

C. S. CLENDENNIN, *being produced, affirmed, and examined, saith;*

Examined by Mr. Hill:

My age is forty-seven; occupation, shoemaker; residence, Eberly's Mills, Cumberland county, Pa.

Q. 1. How long have you resided at Eberly's Mills?

A. I moved there the last of September, 1878, and have lived there ever since.

Q. 2. After you moved there in September, 1878, did you ever see any talking-machines at Daniel Drawbaugh's shop there? If so, when first did you see them?

A. As near as I can recollect it was the middle of November, 1878, that I first saw them.

Q. 3. How happened you to see them at that time?

A. I went there on some business, I don't recollect what the business was, though. Then I saw it fastened against the wall there—the instrument. He then told me it was a talking-machine. He then went down into the lower part of the house or cellar, rather. He then spoke up through it, mentioned "Harrisburg is the capital of Pennsylvania, on the Susquehanna river," and "Cumberland county." That is all I remember of him speaking through it.

Q. 4. Please look at the instrument now shown you, which for identification I mark "P," and state whether you ever saw it, and if so, when and where you first saw it?

A. To the best of my knowledge, that was the machine I saw at that time fastened up against the wall.

Q. 5. You have been in his shop from time to time, from November, 1878, down to last summer (1880), have you?

A. I have.

Q. 6. Did you pay much attention to talking-machines, when you were there from time to time, or take much interest in them?

A. Not in particular.

Q. 7. Did you see any fastened up against the wall, from time to time, as you were there, after November, 1878?

A. I did.

Q. 8. Please look at these instruments "A," "D," "E," "G," "I," "K," "M," "N," "O," and state whether, as you would be in Mr. Drawbaugh's shop, from time to time, from November, 1878, to the summer of 1880, you would see instruments resembling these lying around there in his shop.

A. Yes, sir; that instrument there [indicating "A,"] I know I saw in the shop, and think I saw it fastened up against the partition. The others I am not able to identify, except that I saw and handled some such looking instruments that were lying around there.

Q. 9. Have you had any business dealings with Daniel Drawbaugh since you moved to Eberly's Mills?

A. I have.

Q. 10. Of what character?

A. I done his shoemaking for him and his family.

Q. 11. State whether he was able to pay you for your work, as you did it along from time to time, or not.

[*Objected to, on the ground that the witness has not indicated any knowledge as to Drawbaugh's ability to pay, but only as to the fact as to whether he did pay or not.*]

[*Mr. Hill adds to the question:*]

State the fact whether he did pay or not as the work was done.

A. No, sir; he did not pay as the work was done.

Q. 12. Did you run up an account against him?

A. Yes, sir.

Q. 13. When did he pay it?

A. He paid me last winter some time. I am not able to tell just when.

Q. 14. Did you ask him for money, along from time to time, while the account was running up?

A. I did.

Q. 15. What reason did he give for not making payments on it?

A. He said he was short of funds at the present time.

Cross-examined by Mr. Storrow:

Cross-Q. 16. How soon after you went there did you do any shoemaker's work for him and his family?

A. I done work for him in November, 1878.

Cross-Q. 17. About how much did that first job amount to?

A. That is more than I can tell. I made shoes for some of the children.

Cross-Q. 18. Give me some idea of how much that first job was, whether it was three dollars, or thirty dollars, or how much?

A. I think the first job was something like three dollars and seventy-five cents.

Cross Q. 19. How much was the whole amount of your dealings with him during the two years?

A. It was something in twenty dollars. I am not able to give the particular amount.

Cross-Q. 20. Had he paid you any of it before this last winter?

A. No, sir.

Cross-Q. 21. You mean then, that this money he paid you this last winter was the first he ever paid you?

A. Yes, sir.

Cross-Q. 22. Did you ever see at his shop, before the summer of 1880, any talking-machines, besides these which have been named in your deposition?

A. Not that I remember.

Re-direct by Mr. Hill:

Q. Q. 23. Can you say certainly whether you did, or not?

A. I could not positively say that.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to, before me, this 1st day of July, 1881.
FRED. M. OTT,
Examiner.

C. S. CLENDENNIN.

11.15, A. M., adjourned for want of witnesses, until 2, P. M.

July 1, 1881, 2, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

EDGAR W. CHELLIS, *being produced, sworn, and examined, saith:*

Examined by Mr. Hill:

My age is thirty-six years; residence, Harrisburg, Pa.; occupation, merchant. I know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pa., and have known him since the fall of 1878.

Q. 1. How came you to make his acquaintance at that time?

A. It was the time that Mr. J. S. Leonard had a clock of his on exhibition here, and he introduced him to me. Then Dr. Moffitt, brought Mr. Drawbaugh to my store with a wooden model of a faucet, and wanted me to purchase a third interest. He (Moffitt) to purchase the other third. It was left there with me, I think, some two or three weeks. It was in the early part of December, or latter part of November, when Moffitt brought him there. I think it was in the early part of December. I asked Mr. Drawbaugh his lowest price. He said he must have two hundred and fifty dollars, as he was in debt, and they were pressing him for money that he owed. I gave him a check for that amount on the 7th of January, 1879.

Q. 2. Then you went into the faucet business with Mr. Drawbaugh and Dr. Moffitt at that time, did you?

A. Yes, sir.

Q 3. Have you been engaged in that business ever since?

A. Yes, sir.

Q. 4. Where have you conducted the manufacturing part of the business?

A. At Eberly's Mills, in the old shop formerly occupied by Mr. Drawbaugh and by the Axle Company.

Q. 5. How long did Dr. Moffitt retain his interest with you in that business?

A. I think five or six months. Then I bought Mr. Moffitt's interest in the faucet and motor.

Q. 6. Do you know what became of the two hundred and fifty dollars that you paid Mr. Drawbaugh, as you have testified?

A. I do not. I supposed he used it to pay his debts, for it was but a short time until he was out of money again.

Q. 7. State what you know about Drawbaugh's financial condition, from the time when you first became acquainted with him down to the summer of 1880, giving any circumstances or facts that may tend to throw light upon it.

A. He was generally very poor and hard pressed for money. I advanced him a great deal of money during that time. It was in sums ranging from twenty-five cents to twenty-five dollars, which was for the support of his family—for necessaries.

Q. 8. When and how did you have your first knowledge of his talking-machines?

A. Mr. Moffitt told me, before I bought in with the faucet, that Dan had a phonograph and a telephone that he had invented.

Q. 9. State the first conversation that you remember having with Mr. Drawbaugh about it.

A. I can't remember, hardly. We conversed about it, I think, the first time I went over there. I can't remember the conversation. I can't remember whether it was before, or after, I gave him the check. It was near the time.

Q. 10. Who brought up the subject of telephones, in that conversation—you or Drawbaugh?

A. I think it was Mr. Drawbaugh.

Q. 11. During your early connection with the faucet business, did or did not Mr. Drawbaugh urge you to go in with him, in the telephone invention?

A. Yes, sir, repeatedly.

Q. 12. Why did you not?

A. Because I was interested in the faucet and motor business, and wished to push them, and I did not think we could do much with the telephone, as Bell had a patent, and I did not know that he could antedate them.

Q. 13. During any of your early conversations with Mr. Drawbaugh, on the subject, did you say anything to him about Bell's patent and claim of priority over all others?

A. Yes, sir; and I advised him to drop it—the telephone, as he could not ante-date Bell. He said he did not know about that, that he had been working on it a good while. It was his way of expressing himself; when I would say "you can't ante-date Bell," he would say, "I don't know about that. I have been working at it a good while."

Q. 14. What duties did Mr. Drawbaugh undertake to perform in connection with the faucet business, in your arrangement with him?

A. He was to devote his whole time and energies to the manufacture of the faucets and motors.

Q. 15. What did you ascertain about the employment of his time and energies, as you began to get into the faucet business?

A. I found out that while I was working with him, making patterns for the faucet, that he worked very well. I would come home in the afternoon and leave work for him to finish and have ready for the next day, and I generally found it on my return just about as I had left it.

Q. 16. Did you discover that something besides faucets was engaging his mind and attention? If so, what, and how soon did you discover it?

A. I was talking to his wife in regard to it, that is, how slow we were getting along. She says, "Mr. Chellis, Dan works at the telephone as soon as you go away, and most every night does not get home till twelve or one o'clock." And she said that she had been talking to him about it, and wanted him to lay the telephone aside and work on the patterns, and give the telephone up, and he said he would go to the poor-house before he would give up working on it.

Q. 17. What plan did you adopt, if any, at that time, to get him to work more steadily on the patterns?

A. I told him, (we were in the shop), "Dan, we will hurry up and get through with these patterns, and we will look into this telephone, and I will go with you." This seemed to please him, and he talked telephone all the balance of the day, but did not do much, if any, work.

Q. 18. Did you mean what you said, or was it only a little stratagem to get him to finish the patterns?

A. I was just using that so as to get him to finish the patterns, and did not really have much purpose of going in with him.

Q. 19. After the patterns were finished, did he continue to urge you to go in with him on the telephone, or not?

A. Yes, sir.

Q. 20. Did you finally consult counsel about the matter? If so, whom and when?

A. I did; but before that, in fact, I was complaining to some one who came there in the shop—I think it was Mr. Shank, but am not certain—in regard to Dan neglecting his work on the patterns. I said I wished I knew how long he had been at work on the telephone. I then could form some idea how long it was going to take to get it out of his head. This party answered, saying he remembered talking through it in 1870. That is why I consulted counsel. I consulted Mr. Jacobs and Mr. Hill. It was late in the summer, I think, of 1879.

Q. 21. Did Mr. Hill come here at your request to investigate the matter?

A. Yes, sir.

Q. 22. Did he encourage you and Mr. Drawbaugh to prosecute Drawbaugh's claim for the patent, and if not, on what grounds did he discourage you?

A. I took Mr. Hill over to visit Mr. Drawbaugh, and Mr. Drawbaugh showed him the telephones, and explained them to him, but Mr. Hill said it would cost a hundred thousand dollars to fight the Bell Company. He considered Mr. Drawbaugh the original inventor, but advised us not to go into it unless we were prepared to raise a hundred thousand dollars to fight the existing companies.

Q. 23. At the time when you first began to be at Drawbaugh's shop, at Eberly's Mills, did Mr. Drawbaugh show you telephones that he had made before that time?

A. Yes, sir.

Q. 24. Please look at the instruments now shown you, marked "A," "B," "C," "D," "E," "F," "G," "H," "I," "J," "K," "L," "M," "N," "O," "P," "Q," and point out which of those instruments you remember to have been in existence at the time when you first began to go to Mr. Drawbaugh's shop, about the end of 1878, or the beginning of 1879?

A. I remember "B," and this, ["F"] but it did not have this wooden cover. I remember "A." I remember these two ["D" and "E,"] and "N" and "G," and I think I remember these two, "L" and "M." There were so many, and they looked so near alike. These two look so near alike. This I remember ["C,"] and this ["H."] I can't remember so much about "O." It looks so nearly like some of the others. I I don't remember in particular about "K." I think I saw it in 1879 or 1880. I remember of seeing it there, but I can't tell how late it was. "*Q*" is a late instrument. I cannot say when it was made. I remember "I," but this is not the top that was on it. That looks like the old top that I saw, [indicating top now marked "I—2."] I remember of seeing this instrument "P," but I don't remember the time when I first saw it. I can't tell when I first saw "J." I don't think it was there at first, but think it was made after I went there.

Q. 25. Did you, or not, talk through these machines, or any of them, during the year 1879?

A. I think I talked through this machine ["H."]

Q. 26. Was that machine fastened up against the wall any part of that year?

A. I think it was fastened up against the cupboard or cupboard door, in the little room where he had his office.

Q. 27. Was it at the time when you first went there?

A. I could not say whether it was or not.

Q. 28. What has been Mr. Drawbaugh's custom, since you began your business there, about having his telephones fastened up against the wall or cupboard for use, or exhibition, or experiment?

A. Those that he was experimenting on he generally kept out of my sight, during the first year of the business; the others were generally lying around on the table. There was generally one on the wall or the cupboard.

Q. 29. Why did he keep out of your sight those upon which he was experimenting?

A. Because, as I said before, I found fault with him for spending his time on the telephones and not on the patterns.

Q. 30. When did you get the patterns finished?

A. I can't remember the date, I might say we were a couple of months working on them. I think we got them done sometime in 1880.

Q. 31. You were somewhat delayed in the business by an interference proceeding with one Hauck, of Mechanicsburg, were you not?

A. Yes.

Q. 32. Then your consulation with counsel, about which you have testified, was before the patterns were finished, was it?

A. Yes, sir.

Q. 33. How soon were the patterns begun after you took hold of the business in January, 1879?

A. I could not say. The first patterns we had made were of wood, to get the brass ones cast from. When I spoke of working two months on the patterns, I alluded only to the brass patterns. And after both the wooden and brass patterns were made, we lost considerable time in testing and changing them.

Q. 34. During what part or parts of the year 1879 was Mr. Drawbaugh urging his telephone invention upon you, as you have testified?

A. I could not tell. There was no particular parts of the year. I could not say what parts of the year—a good many different times, commencing soon after I went in with him on the faucets.

Cross-examined by Mr. Storrow:

Cross-Q. 35. What was the bargain you made with Drawbaugh about going into the faucet business with him?

A. Our agreement says, when the manufacture of the faucets and motor commenced, he was to devote his whole time and energy to the business.

Cross-Q. 36. Do you mean to include the getting up of patterns and tools and other preparatory work, by the term manufacture, in your last answer?

A. No; he was to make the patterns. That was a verbal agreement, and after we commenced the manufacture he was to devote his whole time.

Cross-Q. 37. Was he to make the patterns without any pay?

A. Yes, sir; I to furnish the material.

Cross-Q. 38. When the manufacture begun, was he to have regular pay for his services by the day or month?

A. No, sir.

Cross-Q. 39. What pay was he to have under your bargain with him?

A. One third of the profits.

Cross-Q. 40. So that, if there were no profits, he got nothing; was that the agreement?

A. Yes, sir.

Cross-Q. 41. Did you buy out Dr. Moffitt before you took testimony in the interference case?

A. No, sir; while the interference suit was in progress, but not before we began to take testimony.

Cross-Q. 42. Both he and you testified in that case, did not you?

A. Yes, sir.

Cross-Q. 43. Were Mr. Jacobs and Mr. Hill counsel for you in that case?

A. Yes, sir.

Cross-Q. 44. You have testified that Drawbaugh urged you to go into the telephone with him, soon after you embarked in the faucet business, and that you then declined. Afterwards you acquired an interest in his telephone inventions, did you not?

A. Yes, sir.

Cross-Q 45. When did you first acquire an interest in them?

A. I can't give you the date. I don't remember.

Cross-Q. 46. State as near as you can remember.

A. I think some time in 1880.

Cross-Q. 47. How early in 1880?

A. I could not say without looking at my books.

Cross-Q. 48. Was it in the first quarter of 1880?

A. I could not tell you. My memory of dates is very poor.

Cross-Q. 49. Did anybody else become interested with you at that time?

A. Yes, sir.

Cross-Q. 50. Who?

A. Mr. Jacobs and Mr. Hill.

Cross-Q. 51. What proportion of interest did you three have between you—that is, did you three acquire the whole, or only a part?

A. Only a part. We acquired about a quarter part each.

Cross-Q. 52. A deed of Mr. Drawbaugh, dated in July last, and recorded at the patent office, purports to be a conveyance by Mr. Drawbaugh to the persons named, of his telephone inventions. I suppose that was in pursuance of a sale which you and your associates had made, was it not?

A. I think so. I believe that it was.

Cross-Q. 53. When did you make that sale?

A. I cannot give you the date.

Cross Q. 54. About how long was it before Mr. Drawbaugh filed his application of July last?

A. I could not tell you exactly how long. I can't remember.

Cross-Q. 55. Was it a few days, or was it several weeks or several months?

A. I think it was several weeks.

Cross-Q. 56. Who did you negotiate that sale with?

A. I think it was Moritz Loth and Simon Wolf.

Cross-Q. 57. Where did those negotiations take place?

A. Partly in Harrisburg and partly in Washington.

Cross-Q. 58. They extended over considerable time, did not they?

A. No; not a great deal of time.

Cross-Q. 59. About how long?

A. I can't tell you how long.

Cross-Q. 60. Have not you any recollection how long?

A. I have not.

Cross-Q. 61. It was a matter you took considerable interest in, was not it?

A. Yes, sir.

Cross-Q. 62. And you can't remember when it was, nor how long it occupied?

A. No, I cannot.

Cross-Q. 63. It was between a year and a year and a half ago, was not it?

A. I cannot tell exactly. I shall have to look at my books first.

Cross-Q. 64. Had you and your earliest associates expended any money about Drawbaugh's telephone before you began these negotiations?

A. I don't think we had; I don't remember.

A. Yes, sir; I to furnish the material.

Cross-Q. 38. When the manufacture begun, was he to have regular pay for his services by the day or month?

A. No, sir.

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Cross-Q. 61. It was a matter you took considerable interest in, was not it?

A. Yes, sir.

Cross-Q. 62. And you can't remember when it was, nor how long it occupied?

A. No, I cannot.

Cross-Q. 63. It was between a year and a year and a half ago, was not it?

A. I cannot tell exactly. I shall have to look at my books first.

Cross-Q. 64. Had you and your earliest associates expended any money about Drawbaugh's telephone before you began these negotiations?

A. I don't think we had; I don't remember.

Cross-Q. 65. Under the sale that was negotiated with Mr. Wolf and Mr. Loth, you still retained an interest in some form, did not you?

A. Yes, sir.

Cross-Q. 66. You are the Mr. Chellis who is named as a defendant in the bill of complaint in this case, are you not?

A. Yes, sir.

Cross-Q. 67. What were the terms of the original bargain you made with Mr. Drawbaugh, when you acquired the interest in his telephone inventions, which you have stated?

A. I was to get a quarter of the proceeds.

Cross-Q. 68. What was he to have?

A. He was to have the same.

Cross-Q. 69. Then nothing was paid him for that interest which he parted with, but only a promise that he should have one quarter of the next proceeds; is that so?

A. I don't understand that question. Do you mean Mr. Drawbaugh's interest to Mr. Jacobs and myself?

Cross-Q. 70. I mean to ask you what he was to receive out of the whole business, in addition to one quarter of the profits?

A. He was to receive one quarter of the proceeds of the sale.

Cross-Q. 71. How did you come to negotiate with Mr. Wolf and Mr. Loth for the sale?

A. All I know they came and negotiated with us.

Cross-Q. 72. Had you known either of them before?

A. No, sir.

Cross-Q. 73. Had you known Mr. Marx before?

A. No, sir.

Adjourned until July 2, 1881, at 10 o'clock, A. M.

July 2, 1881, 10, A. M.

Examination resumed, pursuant to adjournment.

Present, Mr. Hill and Mr. Jacobs for respondents, and Mr. Storrow for complainants.

Cross-examination of Mr. Chellis continued by Mr. Storrow:

Cross-Q. 74. Can you now tell me when it was that you first acquired an interest in Drawbaugh's telephone inventions?

A. The 6th day of May, 1880.

Cross-Q. 75. When did you begin your negotiations with Mr. Wolf, Mr. Loth, and their associates?

A. On the 22d of June, 1880, a conditional sale was made, but Mr. Wolf was registered here at Harrisburg on the 24th of May and came here on or about that time, to see me about this business.

Cross-Q. 76. Mr. Wolf resided in Washington at that time, did not he?

A. I believe he did.

Cross-Q. 77. When did you become acquainted with Mr. Abraham, one of the counsel in this suit?

A. On or about the 21st of July, 1880.

Cross-Q. 78. Where did you meet him then?

A. If I remember right, it was Washington, D. C.

Cross-Q. 79. Were any of your associates in Washington with you at that time? If so, whom?

A. Mr. Jacobs, Mr. Drawbaugh, Mr. Hill, and myself were all there.

Cross-Q. 80. Mr. Hill lives in Washington, and Mr. Jacobs in Harrisburg, do they not?

A. They did at that time.

Cross-Q. 81. Mr. Jacobs has continued to live in Harrisburg, has he not?

A. Yes, sir.

Cross-Q. 82. I noticed that the assignment of Drawbaugh to Klemm, Marx, Wolf, and Loth, dated July 21st, 1880, bears the names of yourself and Mr. Jacobs as witnesses. When and where was that deed executed?

A. In Washington. I believe it was executed on the day of its date.

Cross-Q. 83. That deed was in form from Drawbaugh alone, but I suppose it was in effect to carry out the sale or bargain made by yourself and your three associates. Am I correct in that?

A. Yes, sir.

Cross-Q. 84. According to the face of that deed, the entire interest passed to Klemm, Marx, Wolf, and Loth. You and your three original associates were to have an interest, and I suppose that was to come to you in the shape of shares of stock in the corporation to be formed. Was that the expectation and understanding of yourself and your associates?

A. Yes, sir; the interest we retained was to be represented by shares of stock.

Cross-Q. 85. How many shares of stock in The People's Telephone Company did you receive in pursuance of that understanding?

A. I received a considerable amount of stock, but that being my own private business, I decline to answer.

Cross Q. 86. The printing of the defendants' testimony is being done at the printing-office of the Harrisburg *Independent*, a newspaper of this city, is it not?

A. Yes, sir.

Cross-Q. 87. You, or you and Mr. Jacobs, selected that office and arranged with that office about the printing, did you not?

A. I can't say it was us that made the arrangement. Mr. Abraham was here, and I recommended Mr. Wallower, the proprietor of the *Independent*, as he had done my printing in the faucet case.

Cross-Q. 88. I call your attention to an article in the Harrisburg *Independent* of Monday evening, June 27th, 1881, entitled, "The Telephone Case—The Taking of Evidence Resumed." I also call your attention to an article in the Harrisburg *Independent*, Thursday evening, June 30th, 1881, headed, "More Evidence—Testing the Telephone. Drawbaugh's Claim Becoming Unquestionable." Did you read these two articles when they came out?

A. I believe I did.

Cross-Q. 89. Has the subject of having some articles about Drawbaugh's case in the Harrisburg newspapers been the subject of any conversation within the last three months between you and anybody connected with that newspaper, or between you and any of your associates or counsel?

A. Yes, sir; Mr. Jacobs did not like the idea of these articles being in the newspapers, and wanted me to speak to Mr. Wallower to discontinue the printing, or publishing I should say, of these articles.

Cross-Q. 90. How do you suppose the newspaper got hold of the statements as to the witnesses and testimony hereafter to be presented by the defendants, which are contained in the paper of June 27th?

A. I could not say, as I did not inform Mr. Wallower in regard to it.

Cross-Q. 91. During last month, the *Independent* republished two long articles on the subject of Drawbaugh's inventions on the telephone, which appeared in other newspapers many months ago. I suppose you saw those articles in the *Independent*?

A. Yes, sir.

Cross-Q. 92. How do you suppose that the *Independent* got hold of those articles, to republish them just now?

[*Mr. Hill says he has declined to interfere in any way with the cross-examination, although nearly all of it has been entirely irrelevant to the question whether Mr. Drawbaugh or Mr. Bell were the first inventors of the telephone, and has been, moreover, entirely outside of the line of the direct examination, so as to amount practically to a new direct examination on behalf of the complainant and that on matters entirely irrelevant and immaterial. He expresses the hope that this line of cross-examination will be cut as short as possible, and will be confined to what the witness knows, instead of what he supposes.*

Complainants' counsel says that he has been unable to see how any testimony from this witness is relevant to the question whether Mr. Drawbaugh or Mr. Bell is the first inventor of the telephone, inasmuch as the witness testified that he had no knowledge on the subject, and never knew Drawbaugh until two years and a half after the grant of Mr. Bell's patent.]

A. I suppose they were copied from New York and Boston papers.

Cross-Q. 93. Did it ever occur to you to wonder or inquire how the *Independent* happened to get hold of those old papers to copy from just at that time?

[*Objected to as irrelevant and immaterial.*]

A. No, sir.

Cross-Q. 94. In your examination yesterday, a number of Mr. Drawbaugh's instruments, which have hitherto been introduced in this case, were shown to you for the purpose of identification. Where were those instruments at the time you acquired an interest from Mr. Drawbaugh in May, 1880?

A. I believe they were then at the shop at Eberly's Mills.

Cross-Q. 95. When were they taken away from there, and where were they first taken?

A. I could not tell you exactly. It was soon after that they were taken away. They were brought over here to Harrisburg. I think they were brought to my store.

Cross-Q. 96. Were there brought to your store at that time all the instruments that were shown to you yesterday, or only such of them as you could then find and collect?

A. I don't remember what instruments were brought at that time.

Cross-Q. 97. About how long did they remain in your store?

A. I can't remember; it was only a short time.

Cross-Q. 98. When you made your conditional sale to Wolf and his associates in May, 1880, did the instruments you had in your store pass into their custody?

A. I am not positive that the instruments were at my store at that time, but they did not then pass into their custody.

Cross-Q. 99. When they left your store, where did they go to?

A. I don't remember whether they went back to the shop or to the bank, or where.

Cross-Q 100. Where were they last autumn and last winter?

A. Part of the time in Washington and part of the time here in Harrisburg.

Cross-Q. 101. You bought Drawbaugh's electric-clock inventions, did you not?

A. Three-fourths interest in it, I bought.

Cross-Q. 102. When did you buy that and from whom?

A. I bought one-fourth interest from Jacob Shettel—I could not tell you when without looking at the transfer papers—one-fourth interest from Jacob Grissinger, and one-fourth from Theodore Grissinger.

Cross-Q. 103. Mr. Shettel testifies that he sold you his interest in the spring of 1879, and the Grissingers sold you theirs in the spring of 1880. Does that agree with your recollection?

A. The sales were about a year apart. I think that is right, 1879 and 1880.

[*The two newspapers above referred to are marked for identification by the examiner.*]

Re-direct by Mr. Hill:

Q Q. 104. Have newspaper men been to you and Mr. Jacobs, from time to time, to get you to furnish information for publication about this suit, as a matter of news, and has their request been denied?

A. Yes, sir; we always refused to give them any information.

Q. Q. 105. Did Mr. Hill and Mr. Abraham concur with Mr. Jacobs in disapproving publications regarding the suit?

A. Yes, sir.

Q. 106. When Mr. Wolf first came to you to negotiate for the purchase of the Drawbaugh invention, did he, or not, tell you that he re presented a party who had already purchased the telephone inventions of Klemm and Tisdel, and were purposing to enter upon their manufacture and sale, and that they expected trouble with the Bell Telephone Company, who claimed to monopolize electric telephones of all kinds, and that they had already fully determined to test the validity and scope of the Bell patents, and the question whether the Klemm and Tisdel telephones were infringements thereof? What, if any, statements did he make on those several points?

A. He did state something to that effect. It was in Mr. Jacobs' room at the hotel. I can't remember the exact words he said. It was to the effect that they wanted to use it in evidence against the Bell Company. I mean, they wished to use the Drawbaugh invention in evidence against the Bell Company.

Q. Q. 107. Did he, or not, state that he had been advised that a patent might yet be granted upon the Drawbaugh invention, and that, unless they purchased the invention, the Bell Company might themselves purchase it, if they found their suit likely to be defeated by it, and might then get a patent on it themselves, which they could use against Mr. Wolf and his associates?

A. Something to that effect, but I cannot remember the exact words.

Q. Q. 108. Did Mr. Hill have anything to do with the faucet interference, except to argue the case before the examiner of interferences?

A. No, sir.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 2d day of July, 1881.
FRED. M. OTT,
Examiner.

E. W. CHELLIS.

Adjourned until Wednesday, July 6th, at 2, P. M.

July 6, 1881.

Examination resumed, pursuant to adjournment, at 2, P. M.

Present, Mr. Hill and Mr. Jacobs for respondents, and Mr. Storrow for complainants.

MICHAEL DELLINGER, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

My age is thirty-eight years; residence, Lower Windsor township

York county, Pa.; occupation, miller. I know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pa., and have known him since 1877.

Q. 1. How came you to make his acquaintance in 1877?

A. I went there to visit my brother William, who was running the mill there at that time.

Q. 2. In what month of 1877 was it?

A. In November.

Q. 3. How long were you there?

A. I might have been there two hours in Drawbaugh's shop.

Q. 4. Did Mr. Drawbaugh show you any talking-machines at that time?

A. He showed me two or three machines there he had—talking-machines.

Q. 5. Please look at the machines "A," "B," "C," "D," "E," "F," "G," "H," "I," "L," "M," "O," and see if you recognize any of them as being the machines Mr. Drawbaugh then showed you, and if so, please point them out to the examiner.

A. "A" is one, and "D," and "H," also.

Q. 6. Did he or anybody talk through the machines at that time?

A. No, sir.

Q. 7. Did he offer to talk through them, if you wanted to hear?

A. Not that I recollect.

Q. 8. Did he tell you whether they were operated by electricity or not?

A. He told me that they were talking-machines, and that they were worked by electricity, or something to that effect.

Q. 9. Did he show you any wires or batteries connected with the talking-machines, or ready to be connected with them?

A. Yes, sir.

Q. 10. Are these three machines that you have picked out all the talking-machines that he showed you, or were there others that you cannot now identify?

A. That is all that I know of. He had some more machines there, of course, something like them, but I can't identify them.

Q. 11. Were you ever there in his shop before or after that visit?

A. No, sir.

Cross-examined by Mr. Storrow:

Cross-Q. 12. What did you go to the shop for, then?

A. I went there with my brother, to see some of his machinery and for pastime.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 6th day of July, 1881.
FRED. M. OTT,
Examiner.

MICHAEL DELLINGER.

HENRY (OF JACOB) DELLINGER, *being produced, sworn, and examined, saith:*

Examined by Mr. Hill:

My age is forty-three years; residence, Spring Garden township, York county; occupation, carpenter and butcher. I know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pa., and have known him since 1877.

Q. 1. Were you at Eberly's Mills at the time your brother William moved there?

A. Yes, sir.

Q. 2. Where you in Daniel Drawbaugh's shop when William moved?

A. Yes, sir, I was in. Drawbaugh was not there, though.

Q. 3. Were you there again during the year 1876?

A. Yes, sir; I was.

Q. 4. Were you in Daniel Drawbaugh's shop at that time?

A. I was.

Q. 5. Was he there?

A. He was.

Q. 6. Then you were acquainted with him in 1876 instead of 1877?

A. I was not much acquainted with him. I would not have known him if I had seen him the second time. We were in there only a few minutes, and he did not explain much to us that time.

Q. 7. What time in the year 1877 were you there in Mr. Drawbaugh's shop?

A. The fore part of June.

Q. 8. How do you fix the time as the fore part of June?

A. I had hired a boy on the first of June, and I know he had only been there a few days at that time. They were planting tobacco, him and my wife, at that time.

Q. 9. How do you know it was the year 1877?

A. I only lived one year on that farm, and I looked at the boy's time-book this morning.

Q. 10. How came you to go to Eberly's Mills at that time?

A. To visit my brother William.

Q. 11. Who went with you on that visit?

A. My brother, John, and his wife, Susan.

Q. 12. While you were at Mr. Drawbaugh's shop at the time of that visit, did he show you any talking-machines?

A. Yes, sir; he did.

Q. 13. Please look at the machines on the table, marked "A," "B," "C," "D," "E," "F," "G," "H," "I," "L," "M," "O," and see whether you recognize any of them as machines that you saw at Drawbaugh's shop at that time, and if so, point out to the examiner such machines as you recognize.

A. This "F" and "H," "G," "L," "B;" that is all I can recollect of; I saw more, but they are not here.

Q. 14. Did Mr. Drawbaugh, or anybody else, talk through the machines while you were there?

A. No, sir.

Q. 15. Did he tell you how they were operated?

A. Yes, sir; he told me it was to be a talking-machine that he was working at—making these articles for—to talk through a wire to a distance. He did not say how far. He said that it was to be operated by electricity.

Q. 16. Did he state how they would talk—how they would hear.

A. He stated that people would talk together through it as quick and as plain as we talked together there in the shop.

Q. 17. Did you see any batteries or wires connected with the talking-machines?

A. I saw a battery and a few wires, two or three—two I am certain. He had more wires, but they were attached to clocks, and he had more than one battery, too, but only one that I saw connected with a talking-machine.

Q. 18. Have you ever been there in the shop since that visit?

A. Since 1877? No, sir.

Cross-examined by Mr. Storrow:

Cross-Q. 19. What did you go to Drawbaugh's shop for, on the visit when you saw the talking-machines.

A. I went down to see his machinery, me any my brother William, who took me down to see it.

Cross Q. 20. Did you go to see any particular machine, or go to see his machinery and inventions generally?

A. We went down to see the big clock, that he was working at and the tools, that he made himself.

Cross-Q. 21. What tools did you see that he made himself?

A. I saw some hammers, punches, tongs, all kind of chisels, and some boring machines, that he had to bore iron—drills; and he had wheels—brass cog-wheels that he made. He made one while I was there. Nothing else in particular. He showed me how he separated iron and brass and steel filings and turnings. He had them all in a pile and separated them.

Cross-Q. 22. What kind of a machine did he make the cog-wheel on, that he made?

A. It was a turning machine, where they turn iron on.

Cross-Q. 23. Was it one of his own getting up?

A. He told me so, that he got it up himself.

Cross-Q. 24. How big was the clock that he was working on?

A. I could not tell. It was perhaps three or three and a half feet long, and maybe eighteen inches wide—a heavy clock.

Cross-Q. 25. Was it a common clock, or an electric clock?

A. It was to run by a wire.

Cross-Q. 26. How long were you at his shop at that visit?

A. I was there the best part of a half a day, I guess. I was there on Sunday forenoon, Saturday evening and Saturday afternoon.

Cross-Q. 27. When did you next see any of these talking-machines, after that visit?

A. I never saw them after that, until he was down at my place, I think three weeks ago, and had some with him.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 6th day of July, 1881.

FRED. M. OTT,
Examiner.

HENRY DELLINGER, of J.

JOHN DELLINGER, *being produced, sworn, and examined, saith:*

Examined by Mr. Hill:

My age is forty-seven years; residence, Spring Garden township, York county, Pa.; occupation, laboring. I know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pa. I first knew him in 1877.

Q. 1. You have been present while your brother Henry was testifying this afternoon, have you not?

A. Yes, sir.

Q. 2. Do you remember the visit which he says he and you made together to your brother William, at Eberly's Mills, in 1877?

A. Yes, sir.

Q. 3. In what month was that visit?

A. In June.

Q. 4. How do you fix the time as in June?

A. I had a lot of tobacco plants pulled, and had them ready to plant, and my brother he came, and I had a notion not to go, and I put the children at planting them then. I know from that that it was the beginning of June, but I do not know what day.

Q. 5. Were you down at Daniel Drawbaugh's shop with your brother on that occasion?

A. Yes, sir.

Q. 6. Do you remember seeing any talking-machines there at that time?

A. Yes, sir.

Q. 7. Please look at machines now shown you, marked "A," "B," "C," "D," "E," "F," "G," "H," "I," "L" "M" and "O," and state if you recognize any of them as machines seen by you at Daniel Drawbaugh's shop at that visit.

A. I saw "M," "B," and "H." I believe those are all that I can identify. He had so many lying around there, that I can't remember them, but he said it would be a talking-machine.

Q. 8. Did he tell you how it was operated?

A. Yes, sir; he said by a wire and by talking.

Q. 9. Did he tell you how far he could talk through it?

A. No, sir, not particular. He said you could talk through it as plain as we are talking here.

Q. 10. Did you see any wires or batteries, connected with the talking-machines, that you remember?

LEPHONE COMPANY,-1

A. I did; yes, sir.

Cross-examined by Mr. Storrow:

Cross-Q. 11. Had you ever seen any talking-machines before that visit?

A. No, sir; I had not.

Cross-Q. 12. When did you next see any of Drawbaugh's talking-machines, after that visit?

A. I did not see any since until to-day.

Re-direct by Mr. Hill:

Q. Q. 13. Have you ever been at Drawbaugh's shop, since that visit?

A. No, sir.

Re-cross by Mr. Storrow:

Re-cross-Q. 14. When did your brother begin to run the mill?

A. I guess it was in 1876, when he moved there.

Re-cross-Q. 15. When did he stop running it?

A. I guess in 1880, I think.

Re-cross-Q. 16. Did he move away from Eberly's Mills then?

A. No, sir; I think he lived there a year after he left the mill.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 6th day of July, 1881.
FRED. M. OTT,
Examiner.

JOHN DELLINGER.

Adjourned until July 7th, at 10 o'clock, A. M.

July 7, 1881, 10.40, A. M.

Examination resumed, pursuant to adjournment.

Present, Mr. Hill and Mr. Jacobs, for respondents, and Mr. Storrow, for complainants.

JEREMIAH KOHLER, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

My age is forty-five; residence, Bridgeport, Cumberland county, Pa., occupation, miller; I have known Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pa., and have known him for eighteen years.

Q. 1. Did you at one time live at Eberly's Mills? If so, when did you move there, and when did you move away from there?

A. Yes, sir; I moved there in April, 1873, and moved away from there in April, 1874.

Q. 2. State whether Mr. Drawbaugh showed you any talking-machines, while you lived there at Eberly's Mills?

A. Yes, sir.

Q. 3. Please look at the machines "A," "B," "C," "F," now shown you, and state when and where you first saw them?

A. I saw them in 1873, down in Daniel Drawbaugh's shop.

Q. 4. Are you certain that you saw this machine "A," at Daniel Drawbaugh's shop, at the time you lived at Eberly's Mills, and before you moved away?

[*Objected to as leading, and as an attempt by the party to contradict his own witness.*]

[*Mr. Hill states that, on the contrary, he wishes to establish the fact.*]

A. Yes, sir.

Q. 5. What was Mr. Drawbaugh doing to it, or with it, at the time you saw it, while you lived there?

A. He was working at it,—making it.

Q. 6. Do you remember whether it had the mouthpiece at the side, as now, or in the middle, at that time?

A. I don't remember that.

Q. 7. Do you remember this brass plate, and this electro-magnet, on the back side of the machine, at that time?

A. Yes, sir.

Q. 8. Did Mr. Drawbaugh talk to you through the talking-machine, while you lived there at Eberly's Mills?

A. Yes, sir.

Q. 9. Where was he, and where were you, when he was talking to you through the machines at that time?

A. I was on the second floor of the shop. He was down on the lower floor.

Q. 10. Did you hear and understand, through the machine, what he said?

A. Yes, sir.

Q. 11. Did he talk to you once, or more than once, through the machine?

A. He talked to me several times.

Q. 12. Was it before or after you saw him making this machine "A"?

A. I don't remember that.

Q. 13. Point out the first talking-machines that you saw at Drawbaugh's shop?

A. I saw that ["B."]

Q. 14. Do you remember whether you saw this ["F"] before you saw this ["A"] or not?

A. I saw that tumbler ["F"] first.

Q. 15. Do you remember whether you saw this ["C"] before you saw "A" or not?

A. Yes, sir; I saw that there one, [indicating "C."]

Q. 16. Do you remember whether you saw this one ["C"] before you saw these two ["F" and "B"] or not?

A. No, sir; I don't remember that.

Q. 17. What was your business at Milltown while you lived there?

A. Milling.

Q. 18. Did you know anything about Drawbaugh's financial circumstances at that time?

A. Yes, sir.

Q. 19. What were they?

A. He was a poor man.

Q. 20. Did he used to get flour of you occasionally for his family?

A. Yes, sir.

Q. 21. Did you have any difficulty about getting the money from him for the flour?

A. Yes, sir.

Q. 22. When you saw the talking-machines in his shop while you lived there, did he tell you how they were operated; whether by electricity or not?

A. By electricity.

Q. 23. Did you see any wire or wires connecting the machines that he talked into, and you listened at?

A. Yes, sir.

Q. 24. How many wires, if you remember?

A. I don't remember how many.

Q. 25. Did you see anything there that he called a battery?

A. Yes, sir.

Q. 26. Do you remember whether that was connected with the talking-machines or not?

A. Yes, sir; it was.

Q. 27. Were you in Mr. Drawbaugh's shop occasionally after you moved away from Milltown?

A. Yes, sir.

Q. 28. How often, do you think, down to the year 1879?

A. I can't recollect how often I have been there.

Q. 29. Was it a half dozen times, or more, or less? Give the best idea you can.

A. It might have been a half dozen times.

Q. 30. Did you see talking-machines every time you were there afterwards, or not?

A. Yes, sir; I saw them there when I was there.

Q. 31. Were you there when the Clock Company, Grissinger & Shettel, were working there?

A. No, sir.

Q. 32. You were shown, at Mr. Jacobs' office, this morning before you came on the stand, all the talking machines that have been used here in evidence, and you stated that you could identify only these four machines, "A," "B," "C," and "F." Was that statement correct?

A. Yes, sir.

Cross-examined by Mr. Storrow:

Cross-Q. 33. Are these machines, "A," "B," "C," and "F," in the same condition now that they were in when you first saw them—have they been changed any since then?

A. No, sir; I don't think they have, but are in the same condition.

Cross-Q. 34. Did you see either of these four machines on any of your subsequent visits to the shop, after you moved away from Milltown?

A. Yes, sir.

Cross-Q. 35. How long have you lived at Bridgeport?

A. I have lived there four months.

Cross-Q. 36. Where did you live before that?

A. At West Fairview.

Cross-Q. 37. Did you work at a mill there, and if so, whose?

A. I worked in the iron works.

Cross-Q. 38. How long did you work there?

A. I worked there about two years.

Cross-Q. 39. Where did you live before that?

A. At Harrisburg.

Cross-Q. 40. How long did you live in Harrisburg?

A. I lived here about a year and nine months.

Cross-Q. 41. Where did you live before that?

A. Shiremanstown.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 7th day of July, 1881.
FRED. M. OTT,
Examiner.

J. KOHLER.

CHARLES H. MATTHIAS, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

My age is going on forty-six years; residence, Manchester, York county, Pa.; occupation, carpenter; I have been farming lately. I know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pa.; I have known him since 1877.

Q. 1. How long have you lived at or near Manchester?

A. Six years; within a half a mile of Manchester.

Q. 2. How far is that from Eberly's Mills?

A. It is about twenty miles.

Q. 3. When William S. Dellinger's concern failed, at Eberly's Mills, did you become assignee of the estate?

A. Yes, sir.

Q. 4. What was the first time that you were ever in Daniel Drawbaugh's shop, at Eberly's Mills?

A. In 1877, towards fall. I can't remember the exact time. It was pretty warm yet. I know that. My wife was along with me.

Q. 5. Did Mr. Drawbaugh at that time show you any talking-machines?

A. Yes, sir.

Q. 6. Did he talk through them to you at that time?

A. Yes, sir.

Q. 7. Did you hear and understand plainly what he said through the machines?

A. Yes, sir.

Q. 8. Where was he when he was talking through them, and where were you when you were listening?

A. He was in the second story. I was in the first, I think they call it, away back in the corner.

Q. 9. Were he and you in the same end of the building, or in opposite ends?

A. In opposite ends.

Q. 10. Do you know what instrument it was that he talked into at that time?

A. That one standing there [indicating "H,"] or one like it. I think it was the same.

Q. 11. Was the instrument you used in listening at down-stairs, a large or small instrument?

A. A small one.

Q. 12. You have seen all the instruments this morning that have been used here in evidence; which one most closely resembles the small instrument that you listened at, at that time?

A. This here one ["E"] I can remember.

Q. 13. Do you recollect seeing these instruments, ["G" and "O,"] or either of them, at that time?

A. Yes, sir.

Q. 14. Were you in Mr. Drawbaugh's shop any time during the year 1878? If so, how many times?

A. Once, that I can remember.

Q. 15. Did you see any talking-machines there, then?

A. Yes, sir.

Q. 16. On looking over the other instruments this morning, were you able to identify any, except these four, "E," "G," "H," "O," as positively being the instruments you had seen at Drawbaugh's shop at either of those visits?

A. I might have seen some more, but I can't remember that I did. I can't identify any except these four.

Cross-examined by Mr Storrow:

Cross-Q. 17. Why did you go to Drawbaugh's shop?

A. Mr. Dellinger took me down.

Cross-Q. 18. What did he take you down there for?

A. He said I should go along down there to Mr. Drawbaugh's, that he was making some instruments there that he wanted to get him to show to me.

Cross-Q. 19. What instruments did he show you when you got there

A. First, he showed me his clocks that he was making.

Cross-Q. 20. What else?

A. Then his telephone.

Cross-Q. 21. Did he call it a telephone?

A. That is the way I understood it.

Cross-Q. 22. You had read of telephones in the papers, or heard of them at that time, had not you?

A. No, sir.

Cross-Q. 23. What did Drawbaugh tell you at that time about his telephone?

A. Dellinger said that he should show it to me—talk through it.

Cross-Q. 24. What did Drawbaugh say?

A. He just went to work then and talked. He said we should go and listen.

Cross-Q. 25. Didn't you have any conversation with Drawbaugh about the telephone except that?

A. Not before that.

Cross-Q. 26. Did you ever have any conversation with Drawbaugh about the telephone, except just what you have stated?

A. He said there then, that he has got it all complete now, but he is still improving more. That was at the time of the first visit. He said he would like to have a patent for it, but he was too poor. That is all I know or can remember.

Cross-Q. 27. What did he say to you about it the next time you saw him?

A. Dellinger said, "How is the telephone business?" He said, "It is all right." He was talking through it then again.

Cross-Q. 28. What instruments did you or he talk through this second time?

A. I can't remember whether they were the same ones or not. I did not take particular notice at that time.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, July 7th, 1881.

FRED. M. OTT,
Examiner.

CHARLES H. MATTHIAS.

Adjourned for dinner until 2, P. M.

Examination resumed at 2.45, P. M.

Present, same counsel.

HARMAN K. DRAWBAUGH, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

My age is thirty-three; residence, Harrisburg, Pa.; occupation, machinist.

Q. 1. What relation are you to Daniel Drawbaugh, of Eberly's Mills?

A. I am his nephew, a son of J. B. Drawbaugh.

Q. 2. State when you first heard your uncle, Daniel Drawbaugh, speak of the possibility of conveying the human voice, or other sounds, to a distance by means of electricity.

A. In the fall and winter of 1867 and 1868.

Q. 3. How did you happen to have conversation with him about it at that time, and what was the conversation?

A. I was teaching singing those two winters at Milltown, or Eberly's Mills, and he was one of the interested parties that attended singing very regularly. In our conversation on music, he got talking about sound—different sounds—and told me that they were produced by vibration; and also stated that the different positions, or different tones, high or low, were different vibrations. He said that there were more vibrations in a high tone than there were in a low tone. He gave me at that time the number of vibrations at concert pitch of high and low C, or what was supposed to be that. I don't remember the number. He also told me at that time that I would consider him foolish if he was to tell me that those vibrations would move a piece of iron an eighth of an inch or more in thickness. I laughed at him that time, and told him I supposed I would. He told me then that it certainly would do it, and I don't just know the words, but that, by that means, the sound could be carried to a distance on a wire, by the use of electricity. He also stated that he was going to do it, too—said he had been working at it. I remember of him trying to explain it to me, too, but I could not understand it—did not take any interest in it, really. We had quite a number of conversations on it. I could not just say what time, but it was during those two terms of singing that I had there. He used to throw his head back, and get me to put my finger on his throat, while he made different sounds, in order to show the jar or power of the vibrations of the throat. [Witness indicates with his finger the upper part of the larynx, and shows how it was done.]

Q. 4. When did he first exhibit to you any of his talking-machines?

A. In 1870, about January.

Q. 5. Where had you been for several months prior to that time?

A. In Missouri.

Q. 6. Please look at the machines "B" and "F," now shown you, and state when he first showed these two machines to you.

A. This here machine here [indicating "F"] I am not positive, but think I saw before I went away, but I am sure I saw both the tumbler "F," and machine "B," on my return in January, not quite in the condition they are in now, though. This instrument here ["B"] had a cross-bar of iron right in front of that coil there, [indicating the electro-magnet of "B."] I hardly know how the cross-bar was supported. I remember taking hold of it with my finger and moving it a little. The end of that box there ["B"] there was a piece or skin of bladder across, fastened with a string. I remember that. The other end, I think, had a funnel shape, made out of paper—I supposed it to be paper or pasteboard.

Q. 8. Do you mean that the funnel-shaped paper was applied to the end of the tin box of machine "B," farthest from the electro-magnet?

A. To the best of my recollection it was.

Q. 9. Do you remember anything about his use of plumbago in connection with his use of either of those instruments? If so, which one?

A. Yes, sir; I remember of his using it in this one ["F."]

Q. 10. Do you remember anything about his adjustment of instrument "F"? If so, how did he adjust it?

A. I remember very distinctly of him having a nut on this brass rod here. and adjusting that, [indicating the rod that projects through the top of the wooden cover.]

Q. 11. Did he talk to you, or did you talk, through those machines "F" and "B" at that time, early in 1870?

A. No, sir; not in words, not at that time. He used to get me to make sounds at that time—sounds that he thought had more force, or more vibration, to move the instrument clearly. I remember very distinctly of playing the violin in it.

Q. 12. How soon after that did he talk to you through the instrument, if at all?

A. A very short time afterwards. There were some words that we could understand only.

Q. 13. Give your best idea of the time.

A. It was not more than ten days or two weeks. It just happened while he was experimenting with that machine. I remember that very well.

Q. 14. When did you go to Waynesboro', Pa., to work?

A. In the spring of 1872.

Q. 15. Prior to your going to Waynesboro' to work, did you talk much, or hear him talk much, through the instruments?

A. Yes, sir; I was about the shop then a great deal.

Q. 16. Were the instruments in such condition prior to your going to Waynesboro', that you could hear and understand all that was said through them, or not?

A. Just for a little while at a time. They appeared to require a great deal of adjusting and working at—merely trials, that he got me to help him.

Q. 17. Up to that time, was he at work at it pretty constantly or not?

A. Yes, sir; I knew that he put in the majority of his time at it.

Q. 18. Please look at the machine marked "C," now shown you, and state whether you recollect seeing a machine there in his shop having the parts constructed like this instrument ["C."]

A. I remember of seeing it very well, but I really couldn't say when. I know it was a good while ago.

Q. 19. Do you remember whether it was before you went to Waynesboro' to work or not?

A. My impression is that it was before I went to Waynesboro'.

Q. 20. Do you recollect whether you ever talked, or heard anybody talk, through instrument "C"?

A. No, sir; I don't remember of ever trying to speak in it.

Q. 21. Is the instrument "C" in the same condition as when you saw it at that early time, or were there other parts upon it at that time that are not now upon it?

[*Objected to as leading.*]

A. I think there was a magnet at the back of it, or what I suppose to be the back—this tin here.

Q. 22. Please look at the magnets as arranged upon the instrument which is now shown you, and which, for the purpose of identification, I now mark as "C reproduced," and state how the arrangement of the two

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magnets there compares with the arrangement of the magnet on instrument "C," as you recollect seeing it at that time.

A. In my mind, they are the same, with the exception of that horse-shoe magnet. I don't remember of seeing that in that position. I saw a great many horse-shoe magnets of different sizes hanging around in different parts of the shop with pieces of iron suspended to them.

Q. 23. Do you remember the electro-magnet at the back of the diaphragm on instrument "C"?

A. Yes, sir; I remember of it looking as that does now.

Q. 24. How long did you work at Waynesboro'?

A. I am not right positive, but it was several months.

Q. 25. When did you commence to assist again your uncle Daniel in his shop?

A. In the fall of 1874.

Q. 26. Where were you in the meantime, that is, from the time when you left Waynesboro' to the time when you commenced to assist Mr. Drawbaugh, in the fall of 1874?

A. In the latter part of the summer or fall of 1872, I went to work for the Harrisburg Foundry and Machine Company, of Harrisburg, and worked until 1873, just prior to the panic. I don't know just what month it was. I then went from there into the upper end of Cumberland county, and worked for my father, at cutting staves, for about a month or six weeks, and then bought a saw-mill in company with Mr. Kennedy, and ran that until the fall of 1874. I then sold my interest, and came back to Eberly's Mills.

Q. 27. During that time, to wit: From the time you left Waynesboro' 'till you returned to Eberly's Mills, in the fall of 1874, were you in Daniel Drawbaugh's shop occasionally or not?

A. I was. In the fall of 1872, and winter and spring of 1873, quite frequently.

Q. 28. How about the remainder of the time, from the spring of 1873 till the fall of 1874?

A. I was back and forward, but not so often. I got some little work done there for my mill, and done some myself—went there and done it.

Q. 29. Was Daniel Drawbaugh still working at his talking-machine during that period or not?

A. Yes, sir; I seen him working at it nearly every time I went into the shop, or every time. He had asked me at one time, if I sawed any black walnut that was real nice, that I should send him some. That he wanted it to make some of those instruments. He wanted it to make some nice ones, he said.

Q. 30. Please look at the instrument "A," now shown you, and state when and where you first saw it.

A. I saw it in that condition in the beginning of 1875, that I am positive of. I might have seen it when I first came there, but I am only positive of it, in that condition, in the beginning, or about January, of 1875.

Q. 31. Before seeing it in its present condition, had you seen it in any other condition? If so, what other condition? In what condition was it when you first saw it?

A. I don't know whether this is the one. It was one about this size and shape, with a magnet protruding at the bottom, and the mouth-piece being in the center, where the adjusting-screw now appears. I don't remember that adjusting-screw being in it at that time. By adjusting-screw, I mean the thumb-screw in the middle of the instrument, close to the mouth-piece.

Q. 32. When you saw it about the beginning of 1875, was it then in its present condition or not?

A. To the best of my recollection, it was in its present condition.

Q. 33. What was your uncle Daniel doing in the latter part of 1874 and beginning of 1875?

A. He was working there in the shop. About the most I seen him do was work on these instruments.

Q. 34. Was he doing any work for Wilson Bear and others connected with him, about that time?

A. He had contracted to do some work for them, but I done it about all, or nearly all of it, for him.

Q. 35. Did you know why he got you to do it for him?

A. They were pushing him for the work, and he was so much interested in his talking-machine that he did not get it done. He got me to do the work, I suppose, to give him more chance to work on his talking-machine.

Q. 36. Were you afterwards employed directly by the Axle Company?

A. Yes, sir.

Q. 37. When did you commence work for the Axle Company itself, directly?

A. I think it was on the 29th of March, 1875.

Q. 38. Have you any written memorandum or time-book, made at the time, showing when you commenced work for the axle company?

A. Yes, sir.

Q. 39. Will you please produce it and point out to the magistrate the entries referred to?

A. Unfortunately I have left it at home. I will bring it in the morning.

Q. 40. At the time when you went to work directly for the Axle Company, had they gotten into the shop their own machinery for doing their work?

A. Yes, sir; it was in and in running order, then.

Q. 41. About what time did they get that machinery in and ready for work?

A. It was not a great while before that, that it was ready for work.

Q. 42. Do you think it was in March, 1875?

A. Yes, sir.

Q. 43. On whose machinery did you and your uncle Daniel do that part of the work that was done before the Axle Company's machinery arrived?

A. On Hauck Brothers & Co.'s machinery, which was there in the shop at the time.

Q. 44. Please look at the instruments "D" and "E," now shown you, and state when and where you first saw them, or either of them.

A. I remember of seeing one of them, but I really could not say which one, as far back as January, 1875, and the other, a very short time afterwards, not more than ten days or two weeks. I remember of him working at the one very distinctly. The other I remember to have been finished, or what I supposed to be finished.

Q. 45. Was it the one that you first saw that was finished when you first saw it?

A. Yes, sir.

Q. 46. And do you mean that he was making the other within a short time after that?

A. What I meant to say was, that a short time after I saw the one finished, he was working at the second one.

Q. 47. Were they both completed before the Axle Company got its machinery in there or not?

A. They worked very satisfactorily, to my mind, some time before the Axle Company got its machinery in there.

Q. 48. Then you talked through them, or heard others talk through them, did you?

A. Yes, sir; I talked through them myself, and saw others at them. I mean, they were some distance from me, as I was working in the shop; but I could see others having them in their hands, and putting them to their mouths, and Dan showing them to them. I suppose they were talking through them, but I could not hear on account of the noise in the shop. I have often talked through them with my own mouth.

Q. 49. Did you listen at them while Mr. Drawbaugh, or anybody else, was talking through them?

A. Yes, sir; quite often. More especially, when they were first made.

Q. 50. Could you hear and understand what was said through them or not?

A. Yes, sir; quite distinctly, after the adjustment was proper once.

Q. 51. How long before you commenced to work directly for the company, March 29, 1875, do you think it was that you heard others talk through these instruments "D" and "E," and heard distinctly through them what was said?

A. To the best of my knowledge, it was about a month.

Q. 52. How long did you continue to work for the Axle Company directly, after March 29th, 1875?

A. A very short time; my books will show. I have the day and dates that I worked for them by the day. Then uncle Daniel, he contracted to make the axles by the piece or set. I sub-contracted with him for the manufacturing of them I continued then on, until, I think, in May, 1876. In the spring of 1876, I made some Centennial axles directly for the Company. I made them by the day. My book will also show the date when I began to work on the Centennial axles.

Q. 53. When did you begin to run the freight train for your uncle, Henry F. Drawbaugh?

A. In the latter part of October, 1876.

Q. 54. Do you know when he began to run those freight trains, or have you any idea how long they had been running when you commenced?

A. My supposition is that they commenced in the spring of 1876.

Adjourned until July 8th, 1881, at 10, A. M.

Examination resumed, pursuant to adjournment, at 10.25, A. M., July 8th.

Present, same counsel as yesterday.

Examination of H. K. Drawbaugh continued:

Q. 55. If there are any other instruments here in the room, which you saw Daniel Drawbaugh make or saw at his shop, before you commenced running on the freight trains for your uncle Henry, please point them out to the examiner. I mean any others, except those already testified to.

A. I think I saw him working at this one ["H,"] but it was not before I commenced running on the freight train that it was finished, to the best of my recollection. This I saw ["O"] while running on the road. "H" is the only one I remember of him working at before I commenced running on the road, and I don't think it was finished at that time.

Q. 56. What were you doing in the summer of 1876, after you left the shop and before you went on the railroad?

A. In reality, I was not doing much of anything.

Q. 57. Where were you living that summer?

A. I had my home at Eberly's Mills, but I was doing a great deal of running around. I helped my father a little while at Shiremanstown, putting up an elevator.

Q. 58. Do you remember when you finally stopped running on the freight trains, for your uncle Henry?

A. I think it was some time in March, 1877. I could not say positive as to the time. I ran some chance trips for their accommodation after that, when his son was wanting to get away.

Q. 59. Where were you during the summer of 1877?

A. I will recall that one answer about the time I stopped running on the train. I did stop in March, 1877, but went to work afterwards again, and worked up to the first of September, 1877, or about the first; it may have been the first week.

Q. 60. Then what did you do?

A. I then quit the railroad and went into the telegraph office at Newville, Cumberland county.

Q. 61. How long were you in the telegraph office, to the best of your recollection?

A. Till the beginning of May, 1878.

Q. 62. What did you then do?

A. I then went to Doubling Gap Springs Hotel.

Q. 63. How long did you stay there?

A. Till the latter part of October.

Q. 64. What did you then do?

A. I then came from the springs to Newville, and remained there about a month. From that I came home to Eberly's Mills, and remained a few days, and then went to Mechanicsburg to work for Hauck Brothers & Co., in the machine-shop. I worked for them until June, 1879. I then, in June, went back to Doubling Gap Springs, and remained there until about the middle of September. I then came home to Eberly's Mills, remained there a few days, and commenced working in Harrisburg here, where I have been working ever since.

Q. 65. What were you doing at the Doubling Gap Springs Hotel in the summers of 1878 and 1879?

A. I was clerking.

Q. 66. Please point out to the examiner any talking-machines here in the room which you saw at your uncle Daniel's shop, or saw him working upon, during the time that you were running on the freight train; that is to say, from October, 1876, to September, 1877, other than machines "A," "B," "C," "D," "E," "F," "G," "O?"

A. This machine here, ["H,"] I remember of him working at it, and I remember also of its being finished during that time, or I suppose it was finished. I saw it against the wall there, or the partition. I remember of him using the bell for an alarm, or for calling. At that time I was more interested in the new molasses faucet that he was getting up than I was in telephones. Nearly all our conversation, and nearly all my business, really, going in there, was pertaining to the faucet—while I was on the railroad. I also point out "G" and "O."

Q. 67. Did you ever talk through the machine "H," or hear him talk through it?

A. Yes, sir; I remember that very distinctly.

Q. 68. When was that?

A. It was during that time of running on the road.

Q. 69. Did your uncle Daniel ever say anything to you about patenting his talking-machine? If so, how often, and when first?

A. He spoke to me about it quite often. So far back as 1872, first. He said he would like to get some men to go in with him who would furnish money to get the patent and run the business. After I came to the city here to work, he often told me that I ought to know some one or be acquainted with some one who would take an interest in it—try and see some one. I mean after I came to the city in the latter part of

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1872. I know I never spoke to any one concerning it, except to Mr. William Stees, who was killed a short time ago. I have known him from boyhood. To the best of my recollection, I did not say anything more to him than tell him of the instruments he was working on—what his intentions were.

Q. 70. Prior to the time when your uncle made the magneto instruments, "D" and "E," about the beginning of 1875, how many tumbler instruments like "F" had you seen at his shop?

A. He had several sitting around there.

Q. 71. How many had the bottom broken off or removed, like the instrument "F"?

A. I don't remember more than that one.

Q. 72. Do you have any recollection of an instrument, which he made at a very early day, in which he used a cup instead of a tumbler?

A. No, sir; I do not. There were a great many cups and tumblers sitting around there that he really used, but I can't just remember the time. I remember of cups being there.

Q. 73. Did you ever assist him in making any of the parts of these talking-machines, or any of them?

A. Yes, sir; quite frequently.

Q. 74. At how early a time?

A. I might say from 1870 down to 1876. I would go into the shop quite often, and he would say, "Here, take this and make it for me; it won't take but a few minutes," and may be it would take a half day. That is the way he would get me to work for nothing.

Q. 75. During the period from 1870 down to the beginning of 1875, I want to know whether or not he was making and testing other forms of talking-machines that have not been preserved. What do you know about that?

A. I know of him having machines there that I have not seen lately. I don't know whether they have been preserved or not. One, in particular, was on a very large scale. I knew at the time that he was merely making an experiment. He told me at the time, too, that it didn't work. It was about the time I came from Waynesboro', about the latter part of the summer of 1872. The reason for my remembering that is, he made it out of a box or case that he had made a musical instrument of in his boyhood days, and I was very much taken up with the instrument. I used to amuse myself a good bit on it—that is, the musical instrument. Of course, I was not so well pleased at that time, to see it converted into a talking-machine.

Q. 76. Do you know anything about his experimenting during those years, on different forms and materials for diaphragms for his talking-machines?

A Yes, sir; very often.

Q. 77. Do you know anything about his experimenting, during those years, upon different materials to be used with, or instead of, the plumbago, which he used in his talking-machines?

A. I remember of him working and changing his batteries. I don't know whether it was separate from the plumbago, or whether it was to be used in connection with it; I know he was trying a great many different things in connection with it.

Q. 78. Have you any recollection of his experimenting with pulverized clay, or dry earth, or pulverized stone, or metal filings, in connection with his talking-machines?

A. I remember of him using clay and prepared iron filings, but I don't remember of him using pulverized stone.

Q. 79. Do you remember how long ago it was that he used the clay and prepared iron filings?

A. I think it was during my time of working there, to the best of my recollection—from the latter part of 1874 until 1876.

Q. 80. When you used to assist him in talking through the machines, or listening to his talk, where would the machines be that were used for talking and listening—in what parts of the shop, and on what floor or floors?

A. They were very often changed, so far as parts of the shop were concerned, but hardly ever from one floor to another. They were generally on one floor.

Q. 81. On what floor were they principally used?

A. Counting the basement or cellar as a floor, there was generally one in the basement or cellar, and the other on the third floor.

Q. 82. How were the instruments in the cellar and on the third floor connected?

A. By means of wires.

Q. 83. How did these wires run in the shop, and how were they supported?

A. They generally ran along the joists till they got to the wall, or close to the wall; he generally run them down in a corner.

Q. 84. Were those wires taken down and put up every time he wanted to use the talking-machine, or did they remain permanently attached to the wall and joists?

A. They were never taken down, to my recollection.

Q. 85. When did you first see them up?

A. I first saw them up, as I thought, permanently, in 1874. I have seen them changed some since, on account of making additional rooms in the shop, but not materially changed; have used other wires in different directions—taking them out of the shop; I mean, when he took the one instrument up the creek a short distance there for trial.

Q. 86. Do you remember a line of wires run out at one time to or over the hill near the north-west end of the building?

A. Yes, sir.

Q. 87. Did you see any tests of the talking-machine made on that last mentioned line?

A. No, sir; I did not. I remember of seeing the wires up, though.

Q. 88. Referring to the wires, which ran from the third story to the cellar or basement, when did you last see those wires up?

A. I don't think I have seen them since 1879.

Q. 89. Do you know whether they were taken down then, or whether they are up now?

A. I do not. I have since that talked through telephones there that were in a different place; but I don't know whether those wires are there now or not.

Q. 90. Referring to those wires that ran from the third story to the cellar, what, if any, use was ever made of them, besides their use for the talking-machine?

A. I think they were used for running one of those clocks at one time.

Q. 91. When was that?

A. That was in 1871, I think, that the clock was first made—the first one to the best of my recollection. It might have been before that time.

Q. 92. I understood you to say that you first saw that line of wires in 1874. Does your recollection now go back to an earlier date for them?

A. Yes, sir; in 1869, I remember of the big clock being bought from Mr. W. L. Gorgas, while he was foreman of the shop. It might have been in 1868, but I know that it was while he was foreman. I think he was foreman in 1868 and 1869. Daniel Drawbaugh ran his instrument. Of course, I was not so well pleased at that time, to see it converted into a talking-machine.

Q. 76. Do you know anything about his experimenting during those years, on different forms and materials for diaphragms for his talking-machines?

A Yes, sir; very often.

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Q. 83. How did these wires run in the shop, and how were they supported?

A. They generally ran along the joists till they got to the wall, or close to the wall; he generally run them down in a corner.

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Q. 84. Were those wires taken down and put up every time he wanted to use the talking-machine, or did they remain permanently attached to the wall and joists?

A. They were never taken down, to my recollection.

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A. That was in 1871, I think, that the clock was first made—the first one to the best of my recollection. It might have been before that time.

Q. 92. I understood you to say that you first saw that line of wires in 1874. Does your recollection now go back to an earlier date for them?

A. Yes, sir; in 1869, I remember of the big clock being bought from Mr. W. L. Gorgas, while he was foreman of the shop. It might have been in 1868, but I know that it was while he was foreman. I think he was foreman in 1868 and 1869. Daniel Drawbaugh ran his first electric clock from his large clock, and that was the time the wires were first put down to the earth, either in the cellar or outside of the shop.

Adjourned until 2, P. M., for dinner.

Examination of H. K. Drawbaugh resumed, at 2, P. M., pursuant to adjournment.

Present, same counsel.

Q. 93. How long was that line of wires used for the electric clock, if you remember?

A. I think they used it up to the present time, or until his present clocks were taken down. Those, I think, were the first wires used.

Q. 94. Did not the use of the wires for the talking-machines interfere with their use for the clock?

A. There was a small copper wire run from the talking-machine to these wires, and my impression was, that the clocks were disconnected from the wires at the time of the experiment or trial. Since that time, I know of him putting up other wires for the talking-machine, or telephone, alone

Q. 95. At the time of what experiment or trial?

A. At the trial of machine "B," about my first trial with it. He did not have much wire at that time, either.

Q. 96. Since that time, what other lines of wire have been put up there, and when, as near as you remember?

A. There have been a great many wires put up there since the fall of 1872 that I remember of; but they never remained long at one place. They were moved from time to time. The only one that I remember of helping him to put up was some time in January, 1875. We run that one from the third floor to the garret, or fourth floor, and wound it back and forward several times from one end of the building to the other, to gain length or distance, and then took it from there to the first floor or cellar.

Q. 97. What was that line put up for?

A. It was put up for those two machines there, with curled magnets, "D" and "E."

Q. 98. Were they used in connection with that line?

A. Yes, sir.

Q. 99. Where did Daniel Drawbaugh get his small wire that he used in connection with his talking machines?

A. That is more than I am able to say. I don't know that I ever asked him. His quite small wire, that he used on the small magnets, I helped him to make myself, out of heavier wire. We pulled it, or drew it.

Q. 100. When he used the small magneto machines, "D" and "E," did he use them with batteries, or without?

A. He used them with batteries at that time.

Q. 101. At what time?

A. That was the time we first tried them.

Q. 102. Did you ever see them used without batteries?

A. I spoke through them quite often. I could not say it was without a battery. He would often come to me, or hallo at me in the shop, to go down to the cellar and talk a few words in—that he wanted to try something. At those times I would not know how he had it connected, or anything else, or what he was doing. He would still answer me when I talked in, and tell me to hold it a little farther away from my mouth, or a little closer, and then would ask me the distance I had it, or was speaking from. I would tell him, and he would say "all right," and I would go back to my work; and that would be the last I would see of it, until he would call me again, which, some days, would be pretty often.

Q. 103. Do you recollect ever seeing the machine "B" used with two diaphragms, namely, one at each end of the tin box?

A. No, sir; I don't, not to my recollection.

Q. 104. Did you ever see the machines "G" and "O" used for talking through?

A. I never used them for talking through. I have seen them connected with wires, but have never spoken through them, that I remember of.

Q. 105. What kinds of batteries did your uncle use in connection with his talking-machines?

A. The batteries that he used then were what we would commonly call the Morse battery. I think that is what he told me—that they were made on that principle. But he tried a great many different kinds, I know.

Q. 106. If I understand you correctly, you were in his shop while the Electric Clock Company were carrying on their operations there, in 1878. Am I right?

A. I was, but very seldom.

Q. 107. Did you see any talking-machines there during that time?

A. I did see some sitting around there,—yes, sir.

Q. 108. Did you see him doing anything with them, or at them?

A. My visits to the shop then were confined to a few minutes, just merely between passenger trains, as I was employed away from home during all that time, and did not have any time to spare.

Q. 109. Do you remember how the line wires were attached to this machine "F," when it was in use?

A I don't know whether I can describe that now, or not. There was one that came out of the center of it—a small wire. To the best of my recollection, there was a bar across the top here, and a wire that came up through the center, through that bar—that the wires were attached. It has been so long since I took particular notice of this. My impression is that the wire coming up through the center was with the intention of raising or lowering a plate that he had there. I can't remember distinctly.

Q. 110. I now show you an instrument, which I mark for identification "instrument 'F' reproduced," and ask you to open it and examine it, and see whether you remember a tumbler instrument like that or not.

A. This conveys the impression I had of an adjustment for raising or lowering. I knew there was something of that kind. I remember a tumbler instrument like that,—yes, sir.

[*Complainants' counsel objects to the designation of the exhibit by a phrase which assumes to be a statement of an alleged fact.*]

Q. 111. When did you first see an instrument like this ["F reproduced"]?

A. In 1870. It might have been before that, but I am positive I saw it at that time.

Q. 112. This instrument has a wooden cup supported by a stout wire, the ends of which run through the wooden cover that fits on the end of the tumbler, the wooden cup hanging inside the tumbler when the cover is in place. Do you remember that wooden cup at that time?

A. I remember of a cup being in. I couldn't say whether it was wooden or not. I never took particular notice, that I remember.

Q. 113. Look at the shape of the cup of this instrument and see how it compares with the cup that you remember.

A. In my impression, it is about the same.

Q. 114. Inside of the wooden cup of this instrument is a metal plate rigidly connected to the center of the metal diaphragm by a metal rod. Have you, or not, any recollection of such a device in your uncle's talking machines, and if so, when first?

[*Objected to as leading and incompetent.*]

A. I remember of those rods being in that tumbler, but I can't remember just the connections or constructions any more. So far as those diaphragms are concerned, I saw them made of different metal and of different shapes, from 1870 up to the present time, in the shop.

Q. 115. You say you remember those rods. Do you include the rod running from the middle of the diaphragm down towards the middle of the cup—do you remember that, or not?

A. The only distinct recollection I have is of the adjustment of what I supposed to be that cup. He used the rods for that.

Q. 116. Do you remember why he adjusted the cup—did you understand why, at the time?

A. I don't remember—nothing more than that I supposed it had to be in a certain place before the instrument would work—do what he wanted it to do.

Q. 117. At the time your uncle Daniel made the second small magneto instrument, in the beginning of 1875, did you do any work on it?

A. Yes, sir; I done a good bit of work on it for him.

Q. 118. Do you remember what you did on it?

A. Yes, sir; my impression is, I made the whole thing—very near all of it.

Q. 119. Do you know which of the two instruments, "D" and "E," you worked on?

A. I worked on instrument "D" the most. I done some work on "E," too.

Q. 120. Which is the one that was made before you went to work for him in January, 1875?

A. This is the one, I think, ["E"] he made first. He first made them very temporary.

Q. 121. What work did you do on the instrument "E," which was made before you went to work for him?

A. The parts he had made, he had made very roughly, and while he was making the wood parts of it, he got me to make the other parts, so that, I might almost say, I made the whole instrument. He took it out of the case it had, and made a new walnut casing for it.

Q. 122. Then the instrument was substantially made over again, at that time, was it?

[*Objected to as leading and incompetent.*]

A. It was what I would term reproduced, in order to make it look more respectable.

Q. 123. After it was so reproduced, did you immediately go to work on the other instrument, " D, " or not?

A. Yes, sir; I went to work on it right away, or a very short time afterwards. I was working for him at that time.

Q. 124. There is no cover over the bottom of instrument "D;" did it ever have one or not?

A. I think it did.

Q. 125. There is a small round hole in the bottom cover of instrument " E, " and through the inner end of the curled magnet. What was that hole for?

A. It was first intended for a screw. It had a screw in it at one time.

Q. 126. In the same manner as " D " now has?

A. Yes, sir; one like it.

Q. 127. Did your uncle direct you in your work on those two instruments?

A. Yes, sir; he merely made a small draft of it on a small piece of paper or envelope, I forget now which, and he would tell me from time to time while I was working at it how he wanted it, and I would ask him about it.

Q. 128. Do you recollect whether there was any particular design in not making the instruments exactly the same shape?

A. I remember of there being a difference in the machines, but I could not tell to exactness the difference in the measurements, or anything of that kind, any more. I don't know whether there was a design in making them different or not. I remember of him telling me, but I could not just tell you any more.

Q. 129. With the exception of the removal of the bottom screw from one, and the bottom cover from the other, are those two instruments, "D" and "E," in the same condition now that they were in, when first finished in the early part of 1875, or have they been changed in any way?

A. They have not been changed in any way that I can see.

Q. 130. I want to know whether you could or could not, from your own, unaided memory, and without having either of the machines "D" and "E" before you, have reproduced substantially similar machines, at any time from January or February, 1875, down to the present time?

[*Objected to as incompetent.*]

A. I could have, except in size or caliber. I don't suppose I could have got them exactly the sizes of those. I would have had to make them entirely from my memory of the work on those. I did everything except put the insulated wire on. I did not do that.

Q. 131. Who made the curled magnets for those two machines, if you know?

A. He made the one for the first one, and forged it, and shaped it, and I made the other, I think. There were several—quite a number of them made, and I know that Fettrow made a couple, but I don't know which of them were used.

Q. 132. What was your uncle Daniel Drawbaugh's financial condition, so far as you know, from 1870 down to 1879?

A. I always thought he was poor.

Q. 133. Do you know whether or not his work upon his talking-machines met with opposition on the part of his family, or relatives, or any of them?

A. It met with a very decided opposition on the part of his family; I might say, with all persons he came in contact with, concerning the talking-machine.

Q. 134. What did your father used to say about it?

A. I used to hear him tell him he had better go to work at something that would make him some money, so that he would not be always out of money.

Q. 135. Do you know whether your uncle Daniel was accustomed to show your father his new talking-machines, and what he was doing with them, or not?

A. My impression was then that he tried to keep them away from him, on account of him always discouraging him.

Q. 136. Do you see any machines here on the table that you remember doing any work on for your uncle Daniel, after you finished the two magneto machines, "D" and "E?"

A. No, sir; not in particular. I remember doing little dribs of work for him once in a while afterwards, but it was so trifling that I don't remember which machines it was for.

Q. 137. From all you know of your uncle Daniel's work, of your own knowledge, from 1870 down to 1880, did he, or did he not, ever lay his talking-machine invention aside, and give it up, or give up working upon it, during that period?

A. No, sir; I don't think he ever did. I have known him to work at other work during the day. I have known him then to work on his talking-machine 'till eleven or twelve o'clock at night and sometimes 'till two o'clock in the morning.

Q. 138. From all you know by your own personal observation, what was it that principally engrossed his study and labor during that period from 1870 to 1880?

A. I was under the same impression, as nearly every one else that knew him, that it was the talking-machine.

Cross-examined by Mr. Storrow:

Cross-Q. 139. Did your father ever work in the shop at Eberly's Mills?

A. Yes, sir; he did.

Cross-Q. 140. When did he work there?

A. He worked there first when the Drawbaugh Manufacturing Company first started up in the shop. He done the mill-wrighting work; then put in the fore-bay and water-wheel; and put in some of the line shafting, and worked on the general repairing of the building, when they converted it from a clover-mill into a machine-shop. That was in 1867, I guess. It was when they first fixed the shop.

Cross-Q. 141. He worked there between 1870 and 1880, did not he, also?

A. He did some, but very little while I was there.

Cross Q. 142. How long has he lived at Eberly's Mills?

A. He was born and raised there, and has lived there ever since.

Cross-Q. 143. You haven't got any house and family of your own, have you?

A. No, sir.

Cross-Q. 144. When was it that you knew of your uncle Daniel working till midnight, or later, on his talking-machine?

A. It was during all the time that I was there, from 1870 till I went away in 1872, and then from when I came back in 1874 till I left in 1876.

Cross-Q. 145. Do you mean that he did it occasionally during that period, or that it was a pretty constant habit of his?

A. It was a pretty constant habit of his. I might say that it was every night,—that he was well enough to go to the shop.

Cross-Q. 146. Were you ever there in the shop nights when he was working on the talking-machine?

A. Yes, sir; very often.

Cross-Q. 147. Did you ever meet anybody else there when he was working on the talking-machine at night?

A. Yes, sir; it was a kind of a loafing place for some of us young men. We would go there at night and play "seven-up" sometimes. Then at different times I would meet men out of the village, just right around home, you might say.

Cross-Q. 148. Whom did you ever meet there out of the village nights, when he was working on the talking-machine?

A. I remember of meeting Mr. Fettrow, Mr. Carl, Mr. Holsinger, Mr. Rowe, and a number. I don't just remember who all I met. As a general thing they did not get in 'till I came down. If he got in first he would lock it, and then they could not get in unless some one came who had a key, like me. He never would let them in if they made a noise.

Cross-Q. 149. When did you last see the instrument which you have testified, in your one hundred and eleventh answer, was like the exhibit "F, reproduced"?

A. I really can't tell when last I saw it. I saw it nearly every time I went into the shop, or every time.

Cross-Q. 150. How late do you recollect having seen it?

A. I remember very distinctly of seeing it in 1876, fall and winter. He always had a place that he kept it, as a general thing, until Mr. Chellis took hold of the shop and made changes on the floor there, tore his shelving down and made other changes. I don't remember of seeing it since that.

Cross-Q. 151. Have you made an affidavit about these instruments, or any of them, within the last year?

A. No, sir.

Cross-Q. 152. Did you see any of these instruments during 1880?

A. Yes, sir.

Cross-Q. 153. Where?

A. I don't think that I seen them at any other time than when I gave in my affidavit.

Cross-Q. 154. When was that?

A. To the best of my recollection, it was on the 9th of July, 1880. When I answered the one hundred and fifty-first question, I thought to-day was the 15th of July. I had the impression on my mind that the Fourth of July was a week ago last Monday.

Cross-Q. 155. Where did you see them then?

A. I saw them in Washington.

Cross-Q. 156. Did you then see in Washington all that have been shown you in the course of your deposition?

A. No, sir; not to the best of my recollection.

Cross-Q. 157. What ones did you see then?

A. I remember seeing "B." My mind is very indistinct about that time, because I was very sick at the time, and was sick for two weeks after I returned. I remember of them showing me several instruments there, but I paid so little attention to them, on account of feeling so sick. I think they showed me instrument "A." There might have been a couple more, but I would not like to say.

Cross-Q. 158. What inventions, models, or machines of your uncle Daniel's did you ever know of besides talking-machines?

A. A stave-cutter, stave jointer—the stave-cutter was a stave-cutter header and shingle machine combined—a barrel-head rounding-machine, a mill burr-tram, for leveling or tramming mill-burrs, a carrier, rine, and driver for mill-burrs, a carpet-tack machine, a device or machine for feeding nail-plate. He got up a gas governor at one time. I don't know whether it was ever patented, or not. A hydraulic ram for lifting and forcing water. I believe that is all I can think of now.

Cross-Q. 159. Did you ever have any talk with him about telephones made by any person other than himself?

A. No, sir; not until after we heard of the Bell telephone.

Cross-Q. 160. When did you have a talk with him about the Bell telephone?

A. My first recollection of it is in the second season that I was at work at Doubling Gap Springs. It was the beginning of June, 1879; I

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came down from there to fix the jets of the fountain. I brought them down and did the work in the shop. We then spoke about it, and he told me then, "I know that I am away ahead of him." He said, "If I had had the means to go ahead, I would have had it out long before he got it out."

Cross-Q. 161. Where did you work as a telegraph operator?

A. At Newville, Cumberland county.

Cross-Q. 162. What office?

A. Cumberland Valley Railroad office. I was not employed directly by the railroad company. Mr. Byers had the ticket office and freight office. He is agent there, and had to employ from two to three men besides himself.

Re-direct by Mr. Hill:

Q. Q. 163. I forgot to ask you to produce the memorandum book in which were the entries of your work for the Axle Company and your work on the Centennial axles. If you have it here, please produce it, and point out the entries to the examiner, in order that he may copy them upon the record.

A. Here it is, and these are the entries: "Commenced work for axles March 29."

[*Witness says there is no date of the year, but it was in* 1875.]

[*The account shows work every day through the remainder of March, and the whole of April. There are also some memoranda of axles delivered to customers of the Company in December,* 1875, *and January, February, and March,* 1876.]

Another entry in the latter part of the book is:

"*Work on Centennial March* 28." (*Witness says:*) That is the date I began work at the Centennial axles, and it was in 1876.

[*The book is a small pocket memorandum book with the covers torn off, and witness says:*]

It is the book in which I made my original entries, which I copied into a larger book, which I have lost.

Examination taken, reduced to
writing, and by the witness af-
firmed and subscribed to before
me, this 8th day of July, 1881.
FRED. M. OTT,
Examiner.

H. K. DRAWBAUGH.

Adjourned until July 9th, 1881, at 10 o'clock, A. M.

July 9th, 10.30, A. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

S. S. RUPP, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

I am twenty years old; Shiremanstown is my post-office; I am a teacher. I know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pa. I met him just about three weeks ago. I saw him several years ago, but was never formally introduced to him until recently.

Q. 1. State the circumstances attending your first visit to Mr. Drawbaugh's shop.

A. I was attending the school taught by Mr. Hamaker, sometimes called Frogtown school, and sometimes called Cedar Spring school. We visited the school taught by Mr. Strong, situated in the next district, sometimes called Cedar Run school. Some people call it the Gorgas school. These two schools are known by different names to different people. Nearly every one has his own name for it. After our visit to Mr. Strong's school, we went to Milltown, also called Eberly's Mills. We visited Daniel Drawbaugh's machine-shop and stayed there about an hour. While at the machine-shop, Mr. Drawbaugh spoke about a machine that he had that he called a talking-machine, or speaking-machine. I did not pay much attention to his explanation of the machine. I was interested in something else, and paid attention to the things I was interested in. I was interested particularly in a turning-lathe, on which was placed a patent axle. That is about all I remember about the machine-shop. After that we started for home.

Cross-examination waived by Mr. Storrow.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 9th day of July, 1881.
FRED. M. OTT,
Examiner.

S. S. RUPP.

Adjourned for want of witnesses until 2, P. M.

Examination resumed, pursuant to adjournment, at 2, P. M.

Present, same counsel.

DAVID M. DITLOW, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

My age is thirty-five; residence, Camp Hill, Cumberland county, Pa.; occupation, drover. I know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pa. I have known him for twenty-five years.

Q. 1. Did your father at one time live near Eberly's Mills?

A. Yes, sir.

Q. 1½. How far from Daniel Drawbaugh's shop did he live?

A. A short half mile.

Q. 2. When did he move away from there?

A. April, 1875.

Q. 3. How long had he lived there at the time that he moved away?

A. Twenty-five years.

Q. 4. Did you live in your father's family until he moved away from Eberly's Mills?

A. Yes, sir.

Q. 5. When did you first know of Daniel Drawbaugh's talking-machines?

A. Nine years ago—about 1872.

Q. 6. How came you to know about them at that time?

A. I came to the shop there, and he showed me a machine, with tin tubes at each end, and a wire wrapped with string.

Q. 7. Did you talk through it, or hear anybody talk through it, at that time?

A. Yes, sir; I listened and heard Mr. Drawbaugh talk through it.

Q. 8. Could you understand through the machine what he said?

A. Yes, sir.

Q. 9. From that time until your father moved away, how often do you think you were in Mr. Drawbaugh's shop?

A. I would not know how often, but I have been there, I guess, twice a week, back and forward.

Q. 10. From the time your father moved away, down to 1880, how many times have you been there?

A. I might have been there once a month.

Q. 11. From the time when you first saw the machines, in 1872, down to the time your father moved away, how often did you see

Mr. Drawbaugh working at, or experimenting, with his talking-machines?

A. All the time—whenever I was in there—he was working at them all the time.

Q. 12. During that time, did you see other talking-machines that you did not see in 1872, when you first talked through them?

A. No, sir.

Q. 13. What did you see him working on, when you so often saw him working on talking-machines?

A. I saw him working on wires, and tin, and wood, and other things. I can't answer that question;—I can't tell you.

Q. 14. But you understood that this work was on the talking-machine, did you?

A. Yes, sir.

Q. 15. From the time when your father moved away, down to the year 1879, did you ever see him working on the talking-machine?

A. Yes, sir.

Q. 16. How often?

A. About two or three times.

Q. 17. I showed you in Mr. Jacobs' office, a little while ago, the various instruments that have been used in evidence here. Were you able to recognize any of them as the particular instruments that you saw Mr. Drawbaugh working upon?

A. No, sir.

Cross-examination waived by Mr. Storrow.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 9th day of July, 1881.

FRED. M. OTT,
Examiner.

DAVID M. DITLOW.

Adjourned until Monday, July 11th, at 10 o'clock, A. M.

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Monday, July 11th, 1881, 10 *o'clock*, A. M.

Examination resumed, pursuant to adjournment.

Present, Mr. Hill and Mr. Jacobs for respondents, and Mr. Storrow for complainants.

J. B. DRAWBAUGH, *being produced, sworn, and examined, saith:*

Examined by Mr. Hill:

I am sixty-five years of age; I reside at Eberly's Mills, Cumberland county, Pa.; I am a mill-wright and machinist. I am a brother of Daniel Drawbaugh.

Q. 1. Did you do any work for the Haucks, while they were running the faucet business at the old shop or mill occupied by your brother Daniel, at Eberly's Mills?

A. Yes, sir.

Q. 2. When did you begin to work for them, and when did you quit working for them?

A. I commenced working for the Haucks on the 19th of July, 1873. I quit on the 2d day of July, 1874.

Q. 3. Do you know how long the Haucks ran the business there at that shop after you quit?

A. No, sir; not exactly. They did not run it a long time after I quit.

Q. 4. During the time from July 19, 1873, to July 2, 1874, did the work of the Haucks go on regularly there, or were there intervals when there was no work done?

A. There was intervals that there was no work done at different times.

Q. 5. When they closed up there, what did they do with their machinery in the shop?

A. They removed part of it to Mechanicsburg; the rest of it remained in the shop.

Q. 6. Did you do any work for the Axle Company while it was in operation there at the shop?

A. Yes, sir.

Q. 7. When did you commence work for the Axle Company, and when did you quit working for them?

A. I commenced work for them on the 16th day of March, 1875. I quit—the last work that I done for them was on the 20th day of April, 1875.

Q. 8. Was that all the work that you did for the Axle Company?

A. Yes, sir.

Q. 9. State whether you have fixed these dates, showing the beginning and end of your work for the Haucks, and the beginning and end of your work for the Axle Company, by means of your old account-books, here present?

A. Yes, sir.

Q. 10. Were the entries which you refer to in fixing the dates, made in those books at the time when the work was done?

A. Yes, sir.

Q. 11. Will you please produce the books, and point out the entries to the examiner, in order that he may copy them on to the record?

A. Yes, sir; here is the Hauck Brothers & Company's.

[*Account commences.*]

"Hauck Bros. & Co. Dr.
July 19th, 1873,

		To 5½ days work	
	26	" 6 " "	
August	2	" 6 " "	
	9	" 5½ " "	
	16	" 4 " "	
	23	" 4 " "	
	30	" 2½ " "	August 30) $67.00
		33½	
Sept	4	To 3 days & 7 hours	7.40
"	10	To 3 "	6.00
"	13	To 1 "	2.00
"	20	To 5 "	10.00
"	27	To 6 "	12.00
"	30	To 2 "	4.00
			$41.40

[*The account runs on similarly; the last entry being July 2d,* 1874.]

[*The account against the Axle Company is in another book, and is as follows:*]

"Bare More & Co.
March 16th, 1875.

To ½ days work	1.00
17th, one day work	2.00
18 one " "	2.00
19 one " "	2.00
20 ½ Day "	1.00
22 one Day	2.00

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23	½ Day	1.00
24	one Day	2.00
25	one day	2.00
26	one day	2.00
		17.00

[*Next page.*]

Bare More Co.

April 26th 1874 (Amount from page 1st.)			17.00
March	27th	To ¾ day	1.50
	29	To 1 day	2.00
	30	a day	2.00
	31	½ day	1.00
April	1	one day	2.00
"	2	one day	2.00
April	3	½ day	1.00
April	5	To 4 hours	.80
April	6	To 1 day	2.00
"	7	To 1 day	2.00
"	9	To 1 day	2.00
	10	To ½ day	1.00
April	19th	To 1 day	2.00
	20	To ½	1.00]

Q. 12. I observed that when you were entering up these accounts in the book, and turned over from page one to page two, to commence the entries on page two, you made your first entry on page two as "April 26th, 1874." Is that month and year right, or were they so entered by some mistake?

A. No, sir; they are not correct—it is a mistake. The date of the year should have been 1875. That is an error I have not discovered all this time. 1875 is the right year, and the month, April 26th, is a mistake. It should be March 26th, agreeing with the account on the other page. I made that mistake on adding up the work done to March 26th, and starting a new page. It should have been March.

Q. 13. Were you in the habit of putting down your day's work, from day to day, in that book, as you did the work?

A. Yes, sir.

Q. 14. Do you think you footed up the first page on the 26th of March and carried the balance over to the next page on that day, or may you have carried that footing over to the next page, on or after the 20th day of April, when you closed your work?

A. I would answer that in this way; My usual way is to carry the amount over to the next page when I make the next charge, and I suppose I done that when I made the next day's charge.

Q. 15. Do you recollect anything about this particular instance?

A. No, sir.

[*Mr. Hill asks the magistrate to certify that the account-book against the Hauck Brothers shows that from the* 16*th of March,* 1874, *to the* 26*th day of April,* 1874, *inclusive, the witness worked every day of that time for Hauck Brothers, doing in the time mentioned thirty-one days' work, less three hours. On examining the account, the examiner so certifies.*]

Q. 16. Was that work in March and April, 1875, all the work you did for the Axle Company?

A. Yes, sir; that I recollect of.

Q. 17. When you went to work for them, March 16th, 1875, did they already have their new machinery in the shop?

A. Yes, sir.

Q. 18. What was the character of the first work that you did for them there, as charged in that account?

A. In lining up with boards the inside wall of the shop.

Q. 19. From July 2d, 1874, when you quit the Hauck Brothers, to March 16th, 1875, when you went to work for the Axle Company, what were you working at, and where?

A. I was working at mill-wrighting. I worked some part of the time at Mr. Oyster's mill, and worked around at different places.

Q. 20. Were you in your brother Daniel's shop much during that time?

A. I was there frequently.

Q. 21. Did you do any work for the Electric Clock Company, when they had their works in your brother's shop, from the spring of 1878 to the spring of 1879?

A. No, not that I recollect.

Q. 22. Did you do any work for Mr. Chellis, after he commenced the faucet business there?

A. Yes, sir.

Q. 23. How much, and what?

A. I put up some shafting for him, and pulleys.

Q. 24. Did your brother Daniel ever show you any talking-machines?

A. Yes, sir.

Q. 25. Do you remember the time when he first showed you a talking-machine?

A. Yes, sir.

Q. 26. How near can you fix that time?

A. I would not like to fix any date nearer than some time inside of twelve months. It was some time before I went to work for the Haucks, and may have been the latter part of 1872 or some time in the beginning of 1873.

Q. 27. Did you talk through the machine, or hear anybody talk through it, at that time?

A. Yes, sir; I talked through the machine.

Q. 28. Describe all that took place at that time, when you were first talking through the machine.

A. I came to the shop and Daniel asked me to talk into the machine, that he wanted to adjust something about the machine, I don't recollect whether he said what. I then talked in the machine, saying that Harrisburg was the capital of Pennsylvania, Washington city the capital of the United States of America, and Carlisle the county seat of Cumberland county. I talked something else, not recollecting exactly the words that I spoke. He then came around to me, and told me to sing in the machine, commencing with a low tone of voice and increase to a loud tone. I done so.

Q. 29. Do you know whether he heard what you said when you talked into the machine?

A. Yes, sir; I asked him whether he understood me, and he said he did. He said then to me, "You said that Harrisburg was the capital of Pennsylvania, that Washington was the capital of the United States of America, and that Carlisle was the county seat of Cumberland county."

Q. 30. Did he make any adjustments of the machine during that conversation?

A. Yes, sir.

Q. 31. Please look at the machines now here present, and see if you observe among them the talking-machines with which that conversation was carried on.

A. I can't exactly tell. The machine that I talked through stood on a table. It had a mouth-piece something similar to that, [indicating "F,"] or to this, [indicating "M,"] but I could not positively say whether I talked into this machine "F," or one like it, or this machine "M," or one like it. I only remember that it had a mouth-piece on the top. I remember well that he came around and took the top off of the machine and done something to it, but I did not take notice what. I then spoke a few words of something, not recollecting what. I then commenced singing. I sang "Yankee Doodle" for him, commencing in a low tone of voice, and increasing to a loud tone. I can't particularly say what machine he listened at, whether it was this machine "C" or "B," or machines like them, as I don't remember of being around in the room where he was listening at that time, at all.

Q. 32. Do you recollect ever seeing this machine "I" in his shop?

A. I saw this machine in his shop, but I am not able to say when.

Q. 33. Did you see it there before you went to work for the Hauck Brothers?

A. I think I did, but I would not say positively that I did.

Q. 34. Do you recollect seeing this machine "C," or a machine like this machine ["C reproduced"] in his shop?

A. Yes, sir; I saw this machine there, or one like it, [indicating both machines.]

Q. 35. Can you fix the time when you first saw them?

A. No, not particularly.

Q. 36. Do you remember whether you first saw them before or after you commenced working for the Hauck Brothers?

A. I saw them before and after, and during the time that I was working there.

Q. 37. Did you ever see these machines "B" and F"?

A. Yes, sir.

Q. 38. When, first, so far as you recollect?

A. I saw them machines in 1869, or some like them. I would not like to say that those were the machines. There might have been some made afterwards.

Q. 39. How came you to see them at that time?

A. I seen the machines at that time. I was away from home doing the work of a new mill, located about twelve miles north-west of Carlisle. On a visit home to my family, I went to the shop. I saw them machines, with some others, on a work-bench and in a cupboard that was there.

Q. 40. Was there any talking through the machines at that time when you first saw them?

A. I don't recollect that I did, just at that particular time. There was some talking done, that I recollect of, during that year by other ones.

Q. 41. You say, in one of your answers, that your brother Daniel first showed you the talking-machine within twelve months before July,

1873. Do you mean now that you saw the talking-machines there before he showed them to you?

[*Objected to as leading and argumentative.*]

A. I do.

Q. 42. Whose mill were you working on in 1869, twelve miles north-west from Carlisle?

A. Thomas Stanton's.

Q. 43. What kind of a mill was that?

A. It was a flouring-mill, or grist-mill, sometimes called a merchant-mill.

Q. 44. On what stream was that mill situated?

A. On the Conedoguinit creek.

Q. 45. Have you any book entries here that show when you commenced doing the work on Stanton's mill?

A. Yes, sir.

Q. 46. Were those entries made at the time when you did the work?

A. Yes, sir.

Q. 47. Please produce the book and point out the entry to the examiner, in order that he may copy it on to the record.

A. Here it is.

[*Witness produces a book, which shows an account with T. G. Stanton, commencing April,* 1869, *and running to January,* 1870.]

Q. 48. Was your son, George W. Drawbaugh, employed on that work on Stanton's mill? If so, from what time to what time, as shown by your book?

A. Yes, sir.

[*The account shows cash payments from April* 30*th,* 1869, *to some time after September* 24*th,* 1869, *the last item that is dated, being dated September* 24*th,* 1869, *and there being three small cash items immediately following the item of September* 24*th.*]

Q. 49. Were those cash payments that are set down in George W. Drawbaugh's account in said book, paid to him for work done by him on Stanton's mill?

A. Yes, sir.

Q. 50. You have related the circumstances attending your first talking through the machine in 1872 or 1873. Where were the machines that you talked into and he listened at, at that time?

A. They were down in the shop where Daniel worked. The machine that I talked in was in a small room in the north-eastern corner of the shop, in the second story of the shop; and the machine that he listened at was in the south-eastern part of the shop, on the same floor.

Recess for dinner, until 2, P. M.

Examination resumed, pursuant to adjournment, at 2.45 P. M.

Present, same counsel.

Examination of J. B. Drawbaugh by Mr. Hill suspended in order to take the deposition of John F. Lee.

Examination of J. B. Drawbaugh continued by Mr. Hill:

Q. 51. When did you next talk through the machines, or hear anybody talk through them?

A. Some time after that, may be a month or more, I talked through it from the cellar of the shop; it was on the eastern part of the shop, in the cellar.

Q. 52. Who listened then, and where was he?

A. Daniel Drawbaugh; he was up on the second story of the shop, in the south-eastern room.

Q. 53. State all you remember about that conversation, and the circumstances connected with it.

A. Part of the conversation that I held through the talking-machine was, that Frogtown was the capital of Lower Allen township, and that A. B. Shank was governor. I also described some of the cities of the United States. Among them was Harrisburg, the capital of Pennsylvania, and other conversation that I don't recollect now.

Q. 54. Did you know whether Daniel heard what you said through the instrument?

A. Oh, yes; he told me that he understood all that I said, and also told me part that I did say.

Q. 55. While you were working there for the Haucks, was Daniel doing anything with his talking-machine—working at it, or using it?

A. I noticed him working at it at different times.

Q. 56. From July, 1874, when you quit Haucks, to March 16, 1875, when you went to work for the Axle Company, you say you were at your brother's shop frequently. What was he doing with the talking-machine, if anything, during that time?

A. I noticed that he was working at it during different times that I was there, that some of them were standing on the work-bench, and that some of them were taken apart, and the parts taken out were also lying on the work-bench. I noticed also that one of them was fastened to a cupboard that was there, connected with a wire that ran to the cellar.

Q. 57. While you were working there in March and April, 1875, what was Daniel doing, if anything, about his talking-machines?

A. There was one or two occasions that I recollect that I talked through them from the cellar.

Q. 58. From April, 1875, down to 1879, when you put up the shafting for Chellis, did you do any work in Daniel's shop, so far as you recollect, or not?

A. I don't recollect that I did.

Q. 59. When you put up the shafting for Chellis, what was Daniel attending to?

A. He was not there much. He was attending a trial, or law-suit, that Mr. Chellis had with the Haucks about the faucet invention.

Q. 60. While you were putting up that shafting for Chellis, did you see any talking-machines around in the shop, or not?

A. I did.

Q. 61. Did you see Daniel doing any work on talking-machines while the electric clock company were occupying the shop?

A. I did.

Q. 62. While you were there working for the Haucks, in 1873 and 1874, how often did Daniel get you to talk for him on the machines?

A. Not very often.

Q. 63. Give us an idea of how often.

A. I could not hardly give you an idea. It might have been half a dozen times He was not in the habit of asking me to talk through the machine, as he did some others that frequently visited there.

Q. 64. Did you, along in those years, from 1872 to 1879, or any part of them, get the idea that your brother Daniel was desirous of concealing his talking-machine work from you? If so, what caused you to have that opinion or suspicion?

A. When I first discovered that he was working on his talking-machine, as it was then called, I accused Daniel quite severely of wasting his time on foolish inventions. I told him that they would amount to nothing, and that he had a large family, and that he should turn his attention to something that would support his family better than by working at these foolish things, and that it would amount to nothing in the end, and that he was an extraordinary good mechanic, and that the people knew him to be that; that he could get employment readily, and could make a good living for his family. I had an opinion that he did not want to show them to me. At different times, when I came into the shop, he would set them behind something, or else cover them over, and then try to direct my attention to something else in a different part of the shop. Several times that he had done so, I went and uncovered the machine, to see what he was doing. I found some one of these machines.

Q. 65. From 1872 or 1873, when he first showed you the machine, down to 1879, when you put up the shafting for Chellis, what was the fact about Daniel's working with or on these talking-machines? Was he at them pretty much all the time, or were there times when he was not doing anything at them, so far as you know?

A. He was, as far as I know.

Q. 66. Your brother Henry testified that you requested him not to encourage Dan in his work on the talking-machines, or to discourage him, or something to that effect. Do you remember about that?

A. I do.

Q. 67. What was Dan's financial circumstances, so far as you know, from 1869 down to the beginning of 1880?

A. He was very poor.

Q. 68. Do you know what he did with the money which he received from the old faucet company, composed of Gorgas and others?

A. He paid a great deal of that money for debts that he had contracted before that time.

Q 69. From 1869 down to the beginning of 1880, did your brother devote the greater part of his time to any one invention? If so, what one?

A. All that I seen or noticed was entirely given to the so-called talking-machine.

Q. 70. He made some experiments with the electric clocks and faucets, did he not?

A. He did, but I never knew so much about that. I don't know that he ever called my attention to that machinery—the clock. He did on several occasions to the faucet.

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Q 71. Did Dan ever talk to you much about his financial condition, or not?

A. He did not. On several occasions I asked him for a little money, and he always told me promptly that he had none.

Q. 72. When did your wife die?

A. She died on the 26th day of January, 1875.

Q. 73. For a good many years prior to her decease, there had been some misunderstanding or coldness between your family and that of your brother, had there not?

A. Yes, sir; Daniel's wife and my wife were not on speaking terms until a few weeks before she died.

Q. 74. Please look at the machine "A," now shown you, and state whether you ever saw it before, and if so, whether you can fix the time when you first saw it.

A. I saw the machine before, but I can't fix the time when I first saw it.

Q. 75. Answer the same question as to the machine "D" and "E."

A. I have saw the machines about the shop, but I could not fix any time when I saw them.

Q. 76. Answer the same question as to the machines "G," "K," "L," "M," "N," "O."

A. I have saw them,—I think all of them,—but I could not fix any time when. Neither could I say which of them I saw first or last.

Q. 77. Answer the same question as to the machine "H."

A. I saw the machine, but couldn't give any date when I first saw it.

Q. 78. The same question as to the machine "J."

A. I don't recollect that I saw that machine at all. It may have been one of the machines that I saw fastened to the cupboard, but I did not take any particular notice of it.

Q. 79. Do you recollect the fact of Christian Eberiy breaking a wheel on his buggy or carriage, while riding to or from Carlisle, a good many years ago?

A. I do.

Q. 80. What, in particular, makes you remember it?

A. I was along with him. I was in the buggy at the time.

Q. 81. Can you fix the time when that circumstance occurred?

A. I can, within a mouth or two.

Q. 82. State when it was, and how you fix the date within a month or two.

A. I was working at that time for Mr. Eberly. I was repairing a water-wheel in the grist-mill, and that was some time between the 10th and 27th day of September, 1864. I fix that time from work that I had done before for Mr. Eberly at a brick-yard in Dauphin county. When I returned home from there, I commenced at the grist-mill. I worked at the brick-yard from the 20th day of August to the 31st day of August, 1864. I fix these dates from entries in my book, made at the time the work was done, which book I have here present.

Q. 83. Please point out to the examiner, in order that he may copy them upon the record, the items in the book referring to the work on the mill.

A. Here they are.

[*Examiner copies them as follows:*

[*The date at head of page is* 1864.]

Sept.	5th,	To one day work in mill	2 00
"	10	To 5 days work	10.00
"	15	To 2 day "	4.00
"	17	To 2 day work	4.00
"	27	To 3 days work	6.00

The last three items before the item dated Sept. 5th are for work on the brick-yard.]

Q. 84. Do you, or not, recollect that after you did the work on the brick-yard you meant to work next on the grist-mill?

A. Yes, sir; I did

Q. 85. Was there a carriage-maker at Eberly's Mills, at the time Mr. Eberly broke his carriage wheel, as you have stated? If so, what was his name?

A. Yes, sir, there was; his name was William Lory.

Cross-examined by Mr. Storrow:

Cross-Q. 86. How long have you lived at Eberly's Mills?

A. I lived at Eberly's Mills since 1833.

Cross-Q. 87. Have you made an affidavit about your brother's talking-machines?

A. No, sir; I did not, that I recollect of.

Cross-Q. 88. When did you first see any clocks at your brother's shop?

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A. I can't give anything definite, but I think I saw a clock there from 1871 to 1873, along there.

Cross-Q. 89. Was it run by electricity?

A I am not able to say. The first clock I saw there was a clock with a round face, and was regulated by another clock, but whether by electricity or magnetism, I am not able to say. I don't know how he had it arranged at all. I never examined it.

Cross-Q. 90. Did he make either of those clocks himself, or did he buy both of them?

A. One, as far as I know, he made. The other was a large eight day clock that he had purchased somewhere at a public sale.

Cross-Q. 91. You say that he used part of the money that he got from Gorgas and others for his faucet to pay debts with. I suppose you refer to the money which they paid him to buy his invention when they started the business, do you?

A. Yes, sir.

Cross-Q. 92. What debts did he pay with it, or what kind of debts?

A. Debts that he had contracted for the living of his family, such as meat, flour, and store bills.

Cross-Q. 93. Had not he been able to earn money enough to pay for necessaries for his family as he went along?

A Yes, he would have been able, and more than able, if he had not expended his time on his experiments and inventions.

Cross-Q. 94. What experiments and inventions had he been expending his time on then?

A. The telephone, or speaking-machine, so called here.

Cross-Q. 95. Had he been spending his time on the speaking-machine before he sold his faucet to Gorgas and others?

A. No, not that I know. I didn't know anything about him working on it then at all.

Cross Q. 96. Why was it he had run up debts for groceries and provisions before he sold his faucet to Gorgas?

A. He was then experimenting on faucets and some other inventions that he had.

Cross-Q. 97. Do you mean he had been spending his time on those experiments instead of on regular work that would bring him in regular pay?

A. The most of his time.

Cross Q. 98. How large a family did he have in 1869?

A. I can't exactly tell—some five or six children.

Cross-Q. 99. From the time you stopped working for the Axle Company, in 1875, down to the time the Clock Company began work at Dan's shop, what were you doing?

A. Working in the country, at mill-wrighting, &c.

Cross-Q. 100. Were you in his shop during that time?

A. I was at different times, on a visit

Cross-Q. 101. How large a job was the work you did for Stanton—how much money?

A. I had undertaken the job to finish the mill, excepting some of the work, for twenty-seven hundred dollars, and the extra work done to it, above the contract, amounted to something near thirty-three hundred dollars.

Cross-Q. 102. In your twenty-eighth answer, you undertook to describe what took place the first time when you heard talking through your brother's machine. When was that?

A. That was at the time that I said—a little while before the Haucks commenced work there, but I can't say what took place at the time, any more than I said to him, "Dan, if this is as good and as profitable a machine as you represent it to be, why don't you get it patented?"

Cross-Q. 103. Was that the first time that he and you had ever talked about the machine?

A. We had some conversation about it before that.

Cross-Q. 104. What was that conversation?

A. I couldn't say any more than that I hooted at the idea.

Cross-Q. 105. Was this the first time that he had ever shown you a talking-machine?

A. The first time that he ever showed it to me that I recollect.

Cross-Q. 106. In your sixty-second answer, you say, when you first discovered that he was working on it, you accused him quite severely of wasting his time, and so forth. When was that conversation?

A. I could not exactly say. I knew that he was experimenting on something of the kind in 1869.

Cross-Q. 107. Do you think that conversation that you gave in your sixty-second answer was in 1869? Is that your memory?

A. It was about then, or some time after. I could not point out any time positively, but it was before I talked through the machine.

Cross-Q. 108. Did you name that machine to him in that conversation?

A. I don't know that I did; I don't recollect.

Cross-Q. 109. In that answer, you say that you blamed him for working at these foolish things that would amount to nothing in the end. What things did you name to him at that time?

A. I meant his general inventions, that he had before and at that time.

Cross-Q. 110. Did you ever blame him specially about the talking-machine?

A. I did.

Cross-Q. 111. When?

A. Some time since 1869. I did it, not only once, but at different times. I recollect that at one conversation I told him that it was one of his idols, and that it was full time for him to quit worshipping idols.

Cross-Q. 112. When was that?

A. That was some time on or before 1873—before I talked through the machine.

Cross-Q. 113. You testified that you remember asking your brother Henry to discourage Dan. When was that?

A. It was some time after 1869. I could not tell when. It was while I worked at the mill. I saw him frequently, and we had different conversations about these things.

Cross-Q. 114. Do you mean while you worked for the Haucks?

A. To make me understood properly, I would have said that, in 1869, while I worked at the mill, we had frequent conversations, and I might have said that he should discourage him in working at machinery. I don't say positively that I did, but it might have been at that time, or some time after that.

Adjourned until July 12th, at 10 o'clock, A. M.

July 12, 10.20, A. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Cross-examination of J. B. Drawbaugh continued:

Cross-Q. 115. Did you work for the Drawbaugh Manufacturing Company in 1869?

A. I did, in the early part of the winter of 1869.

Cross-Q. 116. How long did you continue to work for them ?

A. At that time, I worked for them to within a few weeks of the date that I went to work on Stanton's mill.

Cross-Q. 117. You mean, I suppose, that you worked for them during the winter, before you built the Stanton mill ?

A. Yes, sir.

Cross-Q. 118. You worked for them again after you finished the Stanton mill, didn't you ?

A. Yes, sir.

Cross-Q. 119. How long did you work for them the second time ?

A. I am not able to give exact time. I worked for them in the winter of 1869–'70, on until in the spring. I kept no account of my time then ; it was kept by the Company.

Cross-Q. 120. You got through with your work at Stanton's mill some time early in October, 1869, didn't you ? Please look at your account.

A. Yes, sir ; I see that the last work that I done there—job work—was 9th of October. I did other work afterwards that was not job work, and is not in the book. Three days' work at mill is also charged on the 7th of January, 1870.

Cross-Q. 121. The Drawbaugh Manufacturing Company was the company composed of Gorgas and others, who made your brother's patent faucets, was it not ?

A. Yes, sir.

Cross-Q. 122. It was the same concern that was sometimes known as the Pump Company, was it not ?

A. I guess that will want a little explanation, to show the difference. In the commencement, the Pump Company and the Faucet Company were two different Companies. After the invention of the faucet was completed, Daniel discovered that he was not able, for the want of funds, to bring the faucet into market. He sold the right of the faucet to a company by the name of Gardner & Croll, for the sum of one thousand dollars, for which he took Mr. Gardner's paper, with Jacob Coover's name, for security. Then, Daniel turned the faucet into a pump, or, rather, made a pump on the same principle as the faucet. On that they formed a company in the names of Mr. Gorgas, Musser, Hursh, and others. They were to pay him a consideration of six thousand dollars, as I have heard. That company established a machine-shop at Eberly's

Mills, which some of the company told me cost them from twenty thousand to twenty-five thousand dollars. After manufacturing the pump for about one year, they found the pump to be a failure. The Pump Company then purchased the Drawbaugh rotary molasses faucet from Mr. Gardner and others. The price they paid for it I don't know.

Cross-Q. 123. Did Mr. Gardner have anything to do with the mill—I mean, did he work there, or come there?

A. Not that I know. He did some little work there, outside.

Cross-Q. 124. What do you mean by doing a little work outside?

A. He filled up a place on the edge of the mill-pond, to erect a temporary blacksmith-shop.

Cross-Q. 125. Was that close by the mill,—a few feet from it?

A. It was probably thirty feet from the mill, or shop.

Cross-Q. 126. Where did he live then?

A. At Eberly's Mills.

Cross-Q. 127. Does he live there now?

A. No, sir; he does not. He has not lived there for the last six years.

Cross-Q. 128. Did Mr. Gorgas have anything to do with the manufacturing, or did he come over to the shop where manufacturing was going on?

A. Yes, sir; he had and he was there very frequently—as much as two or three times a week.

Cross-Q. 129. There were two Mr. Gorgases, father and son, were there not, in the Company?

A. Yes, sir.

Cross-Q. 130. Which of them was it who was over there frequently, or were both?

A. Young Mr. Gorgas directed the work in the shop, and was there almost all the time, managing the affairs of the shop, and the old gentleman was there often.

Cross-Q. 131. Did your brother Dan have anything to do with the manufacturing for that Company?

A. I don't know anything more than that I had learned at the time that he was one of the stockholders.

Cross-Q. 132. Did he work for them?

A. I don't know that he had done any work for them.

Cross-Q. 133. You think he had nothing to do with their manufacturing, except as a stockholder?

[*Objected to as incompetent.*]

A. Not that I know.

Cross-Q. 134. In your eighty-eighth and eighty-ninth answers, you speak of two clocks, which you saw at your brother's shop, from 1871 to 1873. Did you afterwards see any more clocks there, between 1873 and the time when the Clock Company began operations, in the spring of 1878?

A. I did.

Cross-Q. 135. How many?

A. I recollect of seeing two there; one is there yet.

Cross-Q. 136. Did your brother make them?

A. My son made one of the cases, and the works I would only suppose my brother made. I did not see him making them.

Cross-Q. 137. Which son?

A. George W. Drawbaugh.

Cross-Q. 138. There was an electric clock at one time at Mr. Shapley's, Mechanicsburg. Did your brother make that, or did Mr. Shapley make that?

A. I saw the clock at Mr. Shapley's, but I don't know whether my brother or Mr. Shapley made it.

Cross-Q. 139. In your fifty-sixth answer, you say you noticed, between July, 1874, and March, 1875, what you supposed was a talking-machine fastened to a cupboard in the shop. Whereabouts in the shop was that?

A. In a small room in the north-eastern corner of the shop.

Cross-Q. 140. Was it fastened to the cupboard door, or to the standing part of the cupboard?

A. The cupboard door.

Cross-Q. 141. Inside or outside of the door?

A. The inside of the door. When the door was closed, it was inside of the cupboard.

Cross-Q. 142. How did you come to see it then?

A. The door stood open very often.

Cross-Q. 143. How big a thing was it, and what kind of shape?

A. I don't know that I can exactly recollect. It might have been four or five inches, and was square, probably two or three inches deep. I could not tell; I didn't look at it particularly.

Cross-Q 144. Was it made of light wood or dark wood?

A. I think it was dark wood.

Cross-Q. 145. Did you ever see your brother working on his talking-machines between 1876 and 1879?

A. I did.

Cross-Q. 146. How often?

A. I could not say how often.

Cross-Q. 147. Was it occasionally, or was it very often?

A. It was very often. I don't recollect of seeing him working at anything else.

Cross-Q. 148. In your thirty-first answer, in describing the talk which you say you and he had through the machines, you say that he came around and took the top off the machine you had been talking into, and did something to it. What was it he did?

A. I didn't take any notice, and don't know.

Cross-Q. 149. What did he do it for?

A. To make the hearing of it more distinct.

Cross-Q 150. Has your brother Dan ever lived with you during the last ten years?

A. He did. He boarded with me a few weeks.

Cross-Q. 151. When?

A. I don't know that I can give you any dates, further than that it was the last summer that he lived at Mechanicsburg.

Cross-Q. 152. How many summers did he live at Mechanicsburg?

A. I don't positively recollect, but it appears to me that it was two.

Cross-Q. 153. He lived with you in the summer of 1876, didn't he?

A. I can't positively say. I had him charged with some boarding, but it is not in these books that I have here, and I don't remember.

Cross-Q. 154. Did you go with him to the Centennial, or did he go alone?

A. I wasn't with him.

Cross-Q. 155. Did you ever hear of any telephones invented or made by anybody except your brother?

A. I don't remember that I did, before the talk was about this suit. I might have read some of the circumstances in the papers, but I don't remember.

Cross-Q. 156. Did you ever talk about anybody else's telephones with your brother Dan or your brother Henry before 1880?

A. I don't remember that I ever had any talk with my brother Henry about telephones at all. I did not have any such talk with my brother Dan about anybody else's telephone before 1880, that I recollect.

Cross-Q. 157. In your fortieth answer, I understand you to say that you knew of talking done through your brother's machine in 1869. Is that what you mean by it?

A. I would say here that I only knew of the talking being done by others talking about it, saying that it had been done. I did not see it done.

Cross-Q. 158. You gave a deposition for your brother in the faucet case, didn't you?

A. Yes, I was a witness in the case.

Cross-Q. 159. I call your attention to your twelfth answer, on the one hundred and eighteenth page of the printed record of that case, which answer is as follows: "During the time of the Drawbaugh Manufacturing Company, he was appointed master mechanic of that company, and I never knew what wages he got." I suppose the statement contained in that answer is true, is it not?

A. I would say it was, as far as I was acquainted with it. I only knew of his appointment from what others said. I never saw the records, and I remember of his attention being called to particular work.

Re-direct by Mr. Hill:

Q. *Q.* 160. You have referred to your brother Daniel's being poor and in debt at the time when he sold his faucet and pump to Gardner, Gorgas, and others. Do you know anything about his meeting with heavy losses for a poor man, and becoming involved in debt in consequence of it, by a transaction which occurred about the beginning of the Rebellion, in the latter part of 1860 or early part of 1861?

A. I do.

Q. *Q.* 161. Do you remember what amount of money Dan lost in that transaction?

A. I heard him say about that time that his expenses and labor on manufacturing those machines was about twenty-five hundred dollars.

Q. *Q.* 162. That loss was occasioned by the sale of machines and patent rights in the South just before the Rebellion, the proceeds of which could not be collected by reason of the war, was it not?

A. Yes, sir.

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Q. Q. 163. Do you know whether, at the time when he sold his faucet and pump to Gorgas and others, he was still embarrassed by debts growing out of that old transaction?

A. He was.

Q. Q. 164. You say, in your cross-examination, that when you had the talk through the talking-machine, Dan came in and took the top off of the machine and did something to it, and that it was to make the hearing more distinct. How do you know it was to make the hearing more distinct?

A. I know from the fact that I could not understand what he said. I told him so, and then he tried to adjust it so that I could understand it.

Q Q. 165. You hadn't explained to us before that he talked through the machine to you, but I understood you to say that you did not see the machine at which the talking was heard, but only the one into which you talked. Please explain more fully about that.

A. In the course of the cross-examination, I don't think I understood the question exactly. I thought it referred to a different time.

Q. Q. 166. Did you see him take the top off the machine and do something to it more than once?

A. I don't recollect now that I did, more than once.

Q. Q. 167. Was that once at the time when you first talked through the machine?

A. Yes, sir.

Q. Q 168. That was at the time when you say you didn't go 'round into the room where he was listening. How did you hear him talk through the machine? Did he talk back to you from that room, so that you heard through the same machine that you talked into, or how was it?

A. I don't know. I am a little confused now. If I said that he talked back to me through the same machine, I am not correct. It was at another time that I went in and listened at the same machine that he had been listening at.

Q. Q. 169. I mean, at the time when he took off the top and did something to the machine, which you say was the first time you talked through it. I understand you to say that he took off the top, and did something to the machine, at that time, because you could not hear distinctly. If so, you must have been listening at the machine, and yet I understand you to say you did not listen at the machine at that time. What I want to get at is the fact.

A. I now say that my answer wasn't fully comprehended. When I first talked through the machine, Daniel came around and took the top off of the machine and done something to it; and at another time that I was listening in the same room that Daniel was listening at the first time he talked to me, and I could not understand what he said, and he then came and done something to the machine, or adjusted it, so that I should understand.

Q. Q. 170. Did you then understand, after he adjusted it?

A. Some words, but not all.

Q. Q. 171. Your hearing is slightly defective, is it not?

A. Yes, sir.

Q. Q. 172. Now, at that first conversation, when Dan came around and took the top off of the machine and adjusted it, and then went back again and listened, do you know why he took off the top and adjusted the machine?

A. When he came around, he did say something about it not being quite right, but I don't remember what it was.

Q. Q. 173. How long was the one conversation that you have just mentioned after the other?

A. I couldn't say. I recollect of asking him to talk through the machine, to see whether I could understand it.

Re-cross by Mr. Storrow:

Re-cross-Q. 174. Did you listen at any of your brother's machines while you worked for the Haucks, in 1873 and '4?

A. I think I did.

Re-cross-Q. 175. Had you ever listened with any of them before you worked for the Haucks?

A. I don't remember that I did.

Re-cross-Q. 176. What were the machines and patent rights which your brother sold down South and didn't get the money for?

A. It was a patent stave-heading and shingle-cutter.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 12th day of July, 1881.
FRED. M. OTT,
Examiner.

J. B. DRAWBAUGH.

Adjourned for dinner until 2.15, P. M.

Examination resumed at 2, P. M., pursuant to adjournment.

Present, same counsel.

GEORGE W. DRAWBAUGH, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

My age is thirty-eight; residence, Eberly's Mills, Cumberland county, Pa.; occupation, machinist. I am the son of John B Drawbaugh, and a nephew of Daniel Drawbaugh.

Q. 1. Do you recollect whether you did any work in the shop for the old Drawbaugh Manufacturing Company while they occupied it?

A. No, sir; I did not.

Q. 2. Did you assist your father in doing some work on Stanton's mill, about twelve miles from Carlisle, on the Condoguinit creek?

A. Yes, sir; I did.

Q. 3. What business did you go into soon after the work was done on that mill?

A. Wagon-making.

Q. 4. Where?

A. At Eberly's Mills.

Q. 5. Did you hire a shop and run it yourself?

A. Yes, sir.

Q. 6. How long were you in the business of wagon-making?

A. Near about two years.

Q. 7. About what years were they, as near as you can fix it?

A. The years 1870 and 1871.

Q. 8. While so engaged in carriage-making, did you do any work for Jacob M. Sadler?

A. Yes, sir; I did.

Q. 9. What was that work?

A. It was building a new wagon box, and repairing the running part.

Q. 10. Of whom did you purchase the lumber you used in that job?

A. John F. Lee, of New Cumberland.

Q. 11. How soon did you do the work for Sadler after purchasing the lumber?

A. I began immediately after I purchased the lumber.

Q. 12. Did your uncle, Daniel Drawbaugh, assist you in that job? If so, how?

A. He assisted me in painting the wagon.

Q. 13 State when you first had any personal knowledge of his talking-machine, and state all the circumstances.

A. The first knowledge that I had of the talking-machine was during the time we were painting that wagon. He asked me to talk to him through the machine, and I talked into it to accommodate him more than because I cared about it. While we were talking, he halloed over to me and said: "George, do you hear me?" My answer was that I did. He said then that I should listen a little, he wanted to whisper through the machine. Then he asked me whether I could hear the whispering. I told him that I could hear him rather plainer than I could while he spoke louder. He then asked me to talk and he would listen. I talked into it for him and then asked him whether he could hear me. He allowed that he could, but he couldn't understand what I said. Then he said: "What in the devil is the reason I can't hear as well as you can?" I answered him, saying I didn't know why he couldn't. There was some more connected with that time, but I—when I went to mix my paint I couldn't just get a hold of the can. I found one in the room on the table. He says: "George, where did you get that can?" I answered him: "In the room on the table." He said: "Dang it, I wanted that can for experimenting." He said then that we could clean it after I got through with it, and that it would then answer the same purpose.

Q. 14. Did he ask you to try the talking-machine more than once while you were painting that wagon?

A. Yes, sir, he did; quite often.

Q. 15. And did you do it?

A. Yes, sir.

Q. 16. Do you recollect anything that he said to you through the machine during those times?

A. Yes, sir; I remember of him mentioning my name, "George," and some of the principal cities.

Q. 17. Did you do anything for the Haucks while they were doing business at the shop at Eberly's Mills?

A. Yes, sir; I did.

Q. 18. When did you begin to work for them, and when did you finish?

A. I would have to refer to my book, before I could tell that ex-

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actly. I have my book with me, and from it I find that I began work March 9th, 1874, and closed on the 20th of June, 1874.

Q. 19. Do you remember how long it was after you closed, on the 20th of June, 1874, that the Haucks closed their work at that shop?

A. I can't say that I do. But I don't think that they done any work after that.

Q. 20. Your father worked there till July 2d, 1874. Do you think they were about closing up at that time?

A. I think that is about the time. I was laying around there, waiting for more work, and I never got it afterwards from them. That is what makes me think it was at that time that they closed.

Q. 21. From the year 1867 down to March, 1874, were you in your uncle Daniel's shop much, or not?

A. It was very seldom that I got there.

Q. 22. Did you do any work for the Axle Company while they were carrying on their operations in that shop?

A. Yes, sir; I worked a little for them.

Q. 23. Do your books show when you worked for them?

A. Just in part when I worked.

Q. 24. What time do your books show?

A. "January 22d, 1875, seven hours;" "January 28th, three hours." That is all the time that I have.

Q. 25. Did you do any work for them that is not shown on your books?

A. Yes, sir.

Q. 26. About how much, and when?

A. As near as I can come at it, it was about two weeks. I can't give the exact date. It was in the year 1875, but I don't know the month, or day of the month.

Q. 27. Did you do any work for your brother, Harman K. Drawbaugh, there at that shop, during that year, 1875?

A. Yes, sir; I did.

Q. 28. State whether he was, or was not, doing some work at that time under a contract with the Axle Company.

A. He was working under a contract, but what it was I don't know—how he had the contract.

Q. 29. Did you do any work for your uncle Daniel at that shop in 1877?

A. Yes, sir.

Q. 30. When did you begin and when did you finish that work that you did for him?

A. I must refer to my book again. I began April 30th, 1877, and worked until the 22d of June, 1877.

Q. 31. What were you doing for him at that time?

A. I built him a set of Pelton horse-power patterns; also several clock cases. That is about all I can remember just now of the work I done.

Q. 32. Did you do any work for the Electric Clock Company, while they occupied that shop, during the time from the spring of 1878 to the spring of 1879?

A. Yes, sir; I did.

Q. 33. State whether much or little.

A. I was working pretty regularly for them.

Q. 34. In the year 1876, were you about your uncle Daniel's shop much, or not?

A. Very seldom. My work called me away from the place.

Q. 35. Please look at the instrument "P," now shown you, and state when and where you first saw it.

A. I first saw that machine in 1878, at Dan Drawbaugh's shop.

Q. 36. How came you to see it there then?

A. The wood-work of that machine I made myself at that time.

Q. 37. Was that, or was it not, while the Clock Company's work was going on at that shop?

A. It was while I was working for the Clock Company.

Q. 38. Under whose directions did you make it.

A. Under the direction of Dan?

Q. 39. State the circumstances about the making it—what patterns you had to work from, and what directions were given you by Dan about making it.

A. He had an old machine made of rough poplar boards, something similar to this machine. The changes on it he told me by word of mouth—how to change it. The shape of the base-board was marked out by a pencil.

Q. 40. Please look at the machine "J," now shown you, and state when you first saw that, and how you came to see it.

A. This box I saw in the year 1878. I made that box myself—the wood-work of it.

Q. 41. Who made the metal work?

A. Dan made the metal work. There was no one working on it but him. There was no one working in the shop at that time but him and me.

Q. 42. Was the metal work which was to go into the box made before or after the box, so far as you remember?

A. It was made before, as he measured the metal work to get the right depth of the box, so that it would go in without any trouble.

Q. 43. Do you remember when you first saw this machine "H"?

A. I remember of seeing it before this box ["J"] was made. He gave me this box ["H"] as a sort of a pattern to go by in making "J." He gave it to me more for style than anything else, and I changed the style a little. He stated at the time that he wanted it somewhat deeper and square, instead of smaller at one end than the other.

Q. 44. Were the metal works in the box "H," when he brought it to you for a pattern?

A. Yes, sir.

Q. 45. Did the box then look as though it had been made some time, or did it look new?

A. It looked as though it was made some time before that.

Q. 46. Please look at machine "C reproduced," and state when you first saw a machine like that, to the best of your recollection.

A. This machine, or a machine like it, I saw in 1874.

Q. 47. Did you ever use it, or witness its use, at that time?

A. Yes, sir; I used it, and witnessed its use by others.

Q. 48. Please look at the two machines "F and "B," and state when you first saw machines like those, so far as you recollect.

A. Those machines, or machines like them, I saw first in the year 1870, while painting the wagon box that I have spoken of before.

Q. 49-50. Do you recollect whether the tin box on machine "B" was closed at either end at that time?

A. It was closed at one end—this end next to the magnet; that I recollect of.

Q. 51. Do you recollect what it was closed with?

A. I was under the impression that it was bladder. He was gathering up all the bladders around the country at the time, from all the butchers. I know it was bladder, for I remember of asking him, and he told me that was what it was.

Q. 52. Do you recollect of anything being attached to that bladder?

A. I think there was—either a thread or a piece of wire. I didn't pay much attention to it.

Q. 53. I do not mean at the edges of the bladder, but across the middle of it, in front of the magnet. Do you remember whether there was anything attached to it there or not?

A. I can't say that I do. I didn't pay enough attention to it to examine it closely.

Q. 54. Please look at the various machines now shown you, marked "A," "D," "E," "G," "K," "L," "M," "N," "O," and "Q," and state whether you ever saw these machines, or any of them, or machines closely resembling these, in your uncle Daniel's shop, at Eberly's Mills.

A. Here are machines, marked "D" and "E," that I have seen in the shop. These two I saw lying on the window, in Dan's work-shop. Here is a machine I saw frequently, marked "A." There have been some changes made—the mouth-piece came out here in the center of the machine. Other ways it has the appearance of the machine that I saw. I am satisfied that I saw the balance of the machines, but I can't identify the shapes so well as these other ones.

Q. 55. State whether you did or did not, from the time when you worked for the Haucks down to the time when you worked for the Clock Company, see a good many different talking-machines in and about your uncle Daniel's shop. What is the fact about that?

A. I really can't say whether I did or did not. In the year 1877, I know I seen different machines. From 1874 to that date, I wasn't much in the shop—not a great deal, only what short time I worked for the Axle Company.

Q. 56. When you worked for your uncle Daniel in 1877, making the horse-power patterns and the clock cases, what was he principally giving his own attention to?

A. The most of the time he was working on what he termed his talking-machine.

Q. 57. Didn't he help you any about your work?

A. Nothing more than to show me how he wanted it done. It appeared a good bit of trouble to him to do that, as he was anxious to go ahead with his talking-machine.

Q. 58. When you were working for the Electric Clock Company there, was Dan giving a good deal of attention to his talking-machine or not?

A. The majority of his time he spent on the talking-machine he was supposed to have been working for the Clock Company.

Q. 59. What was he doing at night during that year?

A. Some nights he would be working on the clocks to make up for lost time in day time, and other nights he was working on his talking-machine, seldom leaving the shop before eleven or twelve o'clock.

Q. 60. Do you remember what he was doing when you worked there for the Axle Company a short time in 1875?

A. I can't say that I do, more than my brother used to remark that "Dan's on that machine of his and had better be doing something else."

Q. 61. Do you know what Dan's financial circumstances were during the ten years prior to 1880?

A. He generally appeared a little hard up, I know that.

Q. 62. What reason did you have to know that?

A. My reasons are that he frequently borrowed money of me, as much as two and three dollars at a time, and I have work charged against him in my book that never was paid, that I worked for him in 1877.

Cross-examined by Mr. Storrow:

Cross-Q. 63. When did you make the wood-work of "J"?

A. In 1878, while working for the Clock Company.

Cross-Q. 64. What month?

A. I really could not say.

Cross-Q. 65. What part of the year?

A. I couldn't come at it exactly, but it was somewheres between spring and fall, that I know of.

Cross-Q. 66. Are you perfectly sure of that?

A. Yes, sir.

Cross-Q. 67. What work did you do for Harman Drawbaugh at the shop?

A. I turned up a few buggy axles and worked at different other parts of the axles.

Cross-Q. 68. When did you quit working for the Clock Company?

A. I will have to refer to my book. My memory is a little short to-day. I haven't got the Clock Company's time here at all. I know it was in the year 1878. I really can't say when it was. I haven't the date with me, and I ain't sure that I have it at home.

Cross-Q. 69. Can't you tell from your memory?

A. No, sir; I really can't.

Cross-Q. 70. What did your uncle want the horse-power patterns for?

A. They were made for a man by the name of Liggett, living at that time in the town of Ickesburg, Perry Co.

Cross-Q. 71. What did you have to go by in making them?

A. I had a draft of them, on a large drafting-board.

Cross-Q. 72. Who made the draft?

A. Dan Drawbaugh made the draft.

Cross-Q. 73. What did he have to make it from?

A. That is more than I am able to say.

Cross-Q. 74. Did he send the patterns away as soon as he had got them done, or did he use them?

A. Part of the patterns were sent away before they were all done.

Cross-Q. 75. Where did you have your wagon maker's-shop?

A. My wagon-maker's shop was at the west end of the town called Eberly's Mills.

Cross-Q. 76. How far from your uncle Daniel's shop?

A. I would suppose it to be in the neighborhood of four hundred yards.

Cross-Q. 77. Did you rebuild that wagon you have spoken of at your own shop?

A. Yes, sir.

Cross-Q. 78. Did you paint it at your own shop?

A. No, sir; it was painted at my uncle Daniel's shop.

Cross-Q. 79. What did you take it down there for to paint?

A. For the simple reason that I was no expert on lettering, and he was pretty good at it, and said he would mark off the letters if I would bring it down, and also help to paint them.

Cross-Q. 80. What work was going on at his shop at that time?

A. I don't think there was anything of any account at all—not while I was there.

Cross-Q. 81. Have you lived at Eberly's Mills all your life?

A. Yes, sir; I count that my home.

Cross-Q. 81½. What work did you do for the Clock Company?

A. Nothing more than built the cases of wood.

Cross-Q. 82. How many cases did you build for them?

A. As near as I can mind, it was four or five; they were large ones.

Cross-Q. 83. How many had you built for your uncle Dan before that?

A. Two, that I can remember of.

Cross-Q. 84. Didn't you build a third?

A. I changed one that he had built himself.

Cross-Q. 85. Please describe all the talking-machines that you ever saw at your uncle Daniel's shop.

A. All the description I can give of them is from the machine itself—what I see of it.

Cross-Q. 86. You mean what you see now on the table, or have seen recently?

A. I have seen all the machines that are here on the table, and a great many other ones that are not here.

Cross-Q. 87. Describe those that are not here.

A. I can't give more of a description of them than that they are over there at the shop now; they are hanging there; I can't describe them.

Cross-Q. 88. Do you refer, in your last answer, to instruments which have been made this year, for the purpose of being exact copies of the instruments now on the table?

A. I think that is what they are for.

Cross Q. 89. Did you ever see any talking-machines at your uncle's shop, except these now on the table, and the recent copies of them which you have just spoken of?

A. I can't say whether I did or did not.

Cross-Q. 90. Why can't you say?

A. That is a little hard to answer—why, I can't say.

Cross-Q. 91. Don't you remember whether you ever saw any others?

A. I do not. Some of these machines have been changed so often that one might think they were different machines.

Cross-Q. 92. In your thirteenth answer, you have given a long description of an occasion when you say he and you talked through some of his machines. What machines did you use on that occasion?

A. Here, these are the machines, [indicating "F" and "B,"] or these look like the machine—that tin box and that tumbler.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 12th day of July, 1881.

FRED. M. OTT,
Examiner.

GEO. W. DRAWBAUGH.

JOHN F. LEE, *being produced, sworn, and examined, saith:*

Examined by Mr. Jacobs:

My age is fifty-nine; residence, New Cumberland, Cumberland county, Pa.; occupation, railroad agent, justice of the peace, and engaged in selling lumber occasionally.

Q. 1. Were you engaged in the lumber business at New Cumberland in the year 1870?

A. I was.

Q. 2. With whom?

A. Mr. Christian Eberly and I went into partnership on the 1st of April, 1862. I bought him out on the 10th of March, 1870. I then carried on business myself.

Q. 3. State whether or not, during that year, George W. Drawbaugh bought from you, or from Lee & Eberly, any lumber suitable for making a wagon.

A. I can give you the items that he bought, but somebody else will have to be the judge as to whether it was suitable for a wagon. I probably knew at the time what the lumber was bought for, but I don't know now.

Q. 4. Please state whether the book you now hold in your hand is your book of original entries containing charges for lumber sold during the year 1870, by the firm of Lee & Eberly, and by yourself, and, if so, point out to the examiner any charges for lumber sold to George W. Drawbaugh.

A. It was our book of original entry of the firm of Lee & Eberly, until March the 10th. After which time it was my own book of original entry. The first charge that I find on the books is for "180 ft. of boards @ 45; January the 11th, 1870, $8.10, and 54 ft. of poplar plank @ 35, $1.89."

The next charge was on "March 22d, 1870—it is 170 ft. grub plank @ 13, 2.21; 105 ft. of half inch poplar @ 25, 2.62; 50 ft. 8×4 poplar @ 25, 1.25."

There is but one charge more; that was on "May 2d, 1870, and is for 6 ft. of hickory scantling @ 25 per thousand, 15 cts."

Q. 5. Are those all the charges appearing upon your books for lumber sold to George W. Drawbaugh?

A. Yes.

Cross-examined by Mr. Storrow:

Cross-Q. 6. What was George W. Drawbaugh's business at that time?

A. I don't know; I think he was employed about the Pump Factory, so called, up at Milltown.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 11th day of July, 1881.
FRED. M. OTT,
Examiner.

JNO. F. LEE.

Adjourned until July 13th, at 10, A. M.

July 13th, 10, A. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

DANIEL B. MUSSER, *being produced, sworn, and examined, saith:*

Examined by Mr. Hill:

My age is thirty-four; residence, Lower Allen township, Cumberland county, Pa.; Eberly's Mills is my post-office; I am a farmer. I know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, and have known him ever since I was a boy.

Q. 1. State whether you ever saw any of his talking-machines at his shop at Eberly's Mills, and if so, state when you first saw them.

A. I saw one, an old tin box, that he had talked through, there, in 1873.

Q. 2. How came you to see it in 1873?

A. I had been in the shop there, and he had these things together then. He wanted me to put my ear to it, and I thought it was tomfoolery, and I was not going to be caught by it. I thought he was trying to fool me, and I would not listen.

Q. 3. Please look at the instrument "B," and state whether or not that was the instrument that you saw at that time.

A. This was the instrument.

Q. 4. Is it in the same condition now as then?

A. No, sir; not altogether.

Q. 5. What differences do you see?

A. Well, it was all plastered over inside with plaster of paris, or some white substance. There was a bladder in some shape or form at the end of it next to the magnet.

Q. 6. Do you remember whether the magnet or spools of wire were on it at that time or not?

A. Yes, sir.

Q. 7. How do you fix that time as 1873?

A. It was just the year before my wife died. It was in the summer. She died January 24th, 1874.

Q. 8. Did you ever see any talking-machines there afterwards? If so, when next after 1873?

A. In 1876.

Q. 9. How did you happen to be there in 1876?

A. I came there to the shop and wanted a reaper pitman fixed. He told me he hadn't time to fix it, and he had been showing some talking-machines at that time to some other party that was there that I did not know.

Q. 10. Is that the way you happened to see it at that time, because he was showing it to some other party?

A. Yes, sir.

Q. 11. Was it before or after the harvest of 1876 that you then saw it?

A. I could not tell.

Q. 12. Do you recollect whether you wanted to get your reaper fixed before, or after, or during the harvest?

[*Objected to on the ground that the witness's memory has been exhausted.*]

A. It was before harvest that I wanted to get it fixed.

Q. 13. How do you fix that year as the year 1876?

A. It was the first year I commenced farming after I was married the second time, which was August 15th, 1875.

Q. 14. Do you see here on the table the talking-machine which you saw there in 1876, at the time you went there to get your harvester fixed?

A. I do, to the best of my knowledge. This ["D"] is the machine that I recollect of him showing to the party that was there.

Q. 15. Did you see any talking-machines there in that shop after that time? If so, when?

A. In 1878. I had been there at the shop on a little business. I wanted to see Mr. Drawbaugh, and he was busy talking to three or

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four other men, perfect strangers to me; I did not know them. He was showing them some instruments, something that looked like this one ["H."] He had it open, if I mistake not.

Cross-examined by Mr. Storrow:

Cross-Q. 16. How long have you lived where you do now?

A. I moved there the last time in 1876.

Cross-Q. 17. Where did you live before that?

A. At Camp Hill.

Cross-Q. 18. How long did you live at Camp Hill?

A. Two years, the last time.

Cross-Q. 19. Where did you live before that?

A. Where I now live. I moved there in 1867 the first time.

Cross-Q. 20. What other talking-machines did you ever see at Drawbaugh's shop?

A. None, but what I have testified about.

Cross-Q. 21. When did you last see these before this week?

A. I saw these two machines ["D" and "B"]—I think it was last week—I ain't sure—that Mr. Drawbaugh was there to see me.

Cross-Q. 22. Was anybody with Mr. Drawbaugh last week, when he came to see you?

A. Yes, sir; Mr. Jacobs was with him.

Cross-Q. 23. When did you last see them before that?

A. I had not seen them since the times that I have stated.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 13th day of July, 1881.
FRED. M. OTT,
Examiner.

DANIEL B. MUSSER.

ISAIAH STEIGELMAN, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

I am fifty-two years old; reside at Shiremanstown, Cumberland county; I am a shoemaker. I know Daniel Drawbaugh, of Eberly's

Mills, and have known him for, I suppose, thirty-six or thirty-eight years.

Q. 1. How many times were you ever in his shop at Eberly's Mills?

A. Since he has been in the inventing business, I don't think I have been in more than once.

Q. 2. How often since 1867?

A. Only once since then.

Q. 3. When was that once?

A. August 8th, 1878.

Q. 4. Was anybody with you? If so, who, on that visit?

A. Mr. Reeser, my brother-in-law, was with me.

Q. 5. State whether you saw any talking-machines there at that shop at that time.

A. I did.

Q. 6. When I left you in Mr. Jacobs' office an hour ago, in order to examine Mr. Musser, I requested you to look over the various machines that have been used in evidence here, and if you found the machine which you saw in Drawbaugh's shop in 1878, to bring it with you when you came up to this room to testify. Have you done so?

[*Objected to as incompetent.*]

A. Yes, sir; this is the one that I saw there, and that he was showing me [indicating machine "N," which the witness holds in his hand.]

Q. 7. While you were there at the shop, at that time did you see either of the Grissingers there,—Theodore or Jacob?

A. There was a man there. They said it was a Grissinger. If it had been Theodore, I would have known the man, for I know him.

Q. 8. Did they say, while you were there—that it was a Mr. Grissinger?

A. Yes, sir.

Q. 9. Where was Mr. Grissinger, and what was he doing, at the time that you saw him?

A. They had a blacksmith fire outside there, and he was at work at it.

Q. 10. Where was the talking machine?

A. The talking-machine was inside, in one of the rooms up-stairs.

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Cross-examined by Mr. Storrow:

Cross-Q. 11. This blacksmith fire, that you speak of, was in a little shed or out-building, on the edge of the mill pond, was it not?

A. Yes, sir.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 13th day of July, 1881.

FRED. M. OTT,
Examiner.

ISAIAH STEIGELMAN.

P. B. REESER, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

I am fifty-nine years of age; I reside at Shirmanstown, Cumberland land county; I am a carpenter. I know Daniel Drawbaugh, of Eberly's Mills, and have known him over thirty years by reputation. I have seen him back and forward, but didn't have any particular acquaintance with him.

Q. 1. You were here present in the room this morning while Mr. Isaiah Steigelman was giving his deposition, were you not?

A. Yes, sir.

Q. 2. Do you recollect the visit to Mr. Drawbaugh's shop about which Mr. Steigelman testified?

A. Yes, sir.

Q. 3. Do you recollect seeing the talking-machine there at that time?

A. I recollect seeing it; yes, sir.

Q. 4. Mr. Steigelman identified the instrument "N" as the one he saw. Please look at it and state your recollection about the matter.

A. As near as I could tell it was about like that.

Q. 5. Do you recollect anything about seeing Mr. Grissinger about the blacksmith shop while you were there?

A. I seen a man there they said was a Grissinger.

Q. 6. That blacksmith shop was a little shop standing close by Drawbaugh's shop, was it not?

A. Yes, sir; standing close by the shop.

Q. 7. Were you ever at Drawbaugh's shop on any other occasion except that?

A. No, sir.

Cross-examined by Mr. Storrow:

Cross-Q. 8. Who else did you see at Drawbaugh's shop on that visit?

A. I seen one of Drawbaugh's—one of John Drawbaugh's boys—I think, working in the shop; Dan Drawbaugh was there.

Cross-Q. 9. Who showed you the talking-machine?

A. Daniel Drawbaugh himself was showing it to Steigelman; I was kind of standing back, looking on.

Cross-Q. 10. What did you and your brother-in-law go there for?

A. I went along to see some of Drawbaugh's machineries that were talked of; and I went also to see whether I could get a kind of a burr made for what we call a bench-screw.

Cross-Q. 11. What did your brother-in-law go for?

A. He went to serve a summons on a man down there, and wanted me to go along merely for company.

Cross-Q. 12. Did he go to serve a summons on a man in Drawbaugh's shop

A. Not at the shop. He lived up in the town.

Cross-Q. 13. Then, I suppose, you were the one that wanted to go to the shop?

A. Of course, I thought when I was down there I would go there, and then ask him whether he could make that for me.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 13th day of July, 1881.
FRED. M. OTT,
Examiner.

P. B. REESER.

ZACCHEUS BOWMAN, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

My age is forty-six; residence, Camp Hill, Cumberland county; occupation, farmer. I know Daniel Drawbaugh, of Eberly's Mills, and have known him from boyhood, nearly.

Q. 1. State when and under what circumstances you first heard him speak of his talking-machine.

A. In regard to the time, I am not positive. It was in 1871, or

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1872, along there. The sickness of his child will tell the date. It was on a Sunday that we were there. I went along with Dr. Bowman, my brother, to see the child, as it was a curiosity to be seen, and while there we saw the clock, and then, talking about the clock, Mr. Drawbaugh said: "I am working at something now—working at a machine that is to talk." That is what he told us, and we just laughed at the idea. As near as I can tell, he said it was some kind of a machine that was to talk to a distance. As we passed out, the doctor said to me: "He is always working at something." That is all that passed between us at that time. The Doctor lived next to us at that time.

[*Objected to by Mr. Storrow as hearsay and incompetent.*]

Q. 2. That visit was to Mr. Drawbaugh's house, and not to his shop, was it?

A. To his house; yes, sir.

Q. 3. Why was the child a great curiosity at that time?

A. Because it had dwindled away to skin and bone and no nourishment seemed to help it any; it was a mere skeleton.

Q. 4. Do you recollect whether the child had been sick for some time?

A. Yes, the child had been sick for some time.

Cross-examination waived by Mr. Storrow.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 13th day of July, 1881.
FRED. M. OTT,
Examiner.

Z. BOWMAN.

Recess for dinner, until 2, P. M.

July 13*th*, 2, P. M.

Adjourned for want of witnesses, until July 14th, at 10, A. M.

July 14*th*, 10, A. M.

No witnesses being produced, adjourned until 2, P. M.

July 14th, 2.45, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

J. A. MOORE, *being produced, affirmed, and examined, saith*:

Examined by Mr. Hill:

I am forty-seven years of age; I reside at Camp Hill, Cumberland county; I am principal of White Hall Soldiers' Orphans School. I known Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pa., and have known him about eleven years.

Q. 1. Were you one of the firm of M. M. Grove & Co., who were in the axle business at one time in the shop now occupied by Mr. Drawbaugh?

A. Yes, sir.

Q. 2. That firm was composed of Jacob Kline, Wilson Bear, Michael M. Grove, and yourself, was it not?

[*Objected to as leading.*]

A. Yes, sir.

Q. 3. When was your said firm formed?

A. On the 23d day of December, 1874. This is the Article of Agreement of that date, which I hold in my hand. The co-partnership was formed on the same day the Agreement was written.

Q. 4. When was that co-partnership dissolved?

A. The 29th of February, 1876, is the date that it was dissolved. There was a written dissolution of partnership which I have here in my hand, and which was signed by all the partners.

Q. 5. That firm, of which you were a member, was sometimes known as the Axle Company, was it not?

A. Yes, sir; we called it the "Harrisburg Axle Company" on our advertisement. It was also known by the name of "M. M. Grove & Co." It is called in the Articles of Agreement, "Bear, Moore, Grove & Kline."

Q. 6. After the dissolution of co-partnership, on the 29th of February, 1876, state whether or not you and Mr. Grove continued the business for a short time.

A. We did. I could not say positively how long—only for a few months. I don't think it was six months.

Q. 7. Did you wind up the business of the company?

A. I did. There was a further dissolution between Mr. Grove and me. After we had run it for a few months, I took all the material and machinery and collected all accounts and paid all debts, and squared the whole thing up. I think now that it was not more than three months, that Mr. Grove and I carried it on together.

Q. 8. Do you remember about when you ceased manufacturing any of those axles or appurtenances?

A. I think, by referring to the book, I can come pretty near the time when we ceased manufacturing axles. We carried on repairing reapers after that. I take it from the last payment I made to H. K. Drawbaugh, April 21st, 1876. A few Centennial axles were made after that by Daniel Drawbaugh; at least we engaged him to make them as samples for the Centennial Exposition. Daniel had charge of the making of them. He contracted to make them perfect; he is a good machinist. I think Harman Drawbaugh worked on them—I know he did—for Daniel. I did not pay him for what he did on the Centennial axles, as the job was direct to Daniel himself.

Q. 9. Do you mean that the last of the work on the axles was done on the 21st of April, 1876?

A. I can't answer without looking at the day-book; it has been so long, I can't remember. By reference to the day-book, I find, "April 21st, H. K. Drawbaugh, Cr. by 45 hours on Centennial axles @ 15 cts., $6.75;" same day, the book shows that I paid him a check of $24.35 in full to date; that includes that and other work.

Q. 10. How long did you continue to have reapers repaired or fixed in that shop?

A. Up to the grain harvest of 1876.

Q. 11. I observe in your day-book an entry dated June 20th, 1876, of a charge to Abr. Oyster, for "patent pitman on 3 knife bars." If you remember the transaction that formed the subject of that entry, please explain it.

A. The entry is as follows:

"1876 Abr. Oyster, Dr.
June 20 To Patent Pitman,
on 3 knive bars, 10.00"

I remember the transaction distinctly. Just previous to the harvest of 1875, Wilson Bear, one of our firm, having the management of the shop at the time, desiring to test the value of this patent pitman on reapers and mowers, offered to have several of these pitmans put on neighboring reapers gratuitously. This Abraham Oyster, with others, availed themselves of the opportunity, and had the patent pitman placed on one portion of his reaper. On the following year, before harvest, I having sole control of the shop, Abraham Oyster demanded of me to have the patent pitman placed upon other portions of his reaper, to which I objected, for the reason that the firm had dissolved, and I was not holding out the same inducements as had been held out the previous year. Mr. Oyster insisted that Mr. Bear had promised him that he should have this patent pitman on all parts of his reaper needed, gratuitously. Against my protest, he had Daniel Drawbaugh make them, and refused to pay me for them, which created some altercation between us. That is my reason for remembering it. This charge in the book is for that transaction. Mr. Drawbaugh handed it to me as work done.

Q. 12. At the time when you formed the firm, on the 23d of December, 1874, had Mr. Bear and Mr. Kline, already before that date, taken any steps towards the manufacture of the axles, &c.?

A. I was well acquainted with Mr. Bear and Mr. Kline, and knew of their transactions previous to our co-partnership. I am certain that no tangible steps were taken towards the manufacture of axles by themselves. They spoke of starting a manufactory as soon as they were able to do so, or could get persons in who would have money enough to carry the thing through.

Q. 13. Did you have any knowledge of S. C. Crawford being in their employ, prior to the formation of your co-partnership, December 23d?

A. I do remember of him having acted as their agent, and with a sample axle traveling portions of the State soliciting orders.

Q. 14. To the best of your recollection, about how long before December 23d was that?

A. I would suppose about two months before December 23d.

Q. 15. Please look at the two checks, to which I now call your attention, of which the following are copies, to wit: First,

"HARRISBURG, PA., *March* 24, 1875.

Harrisburg National Bank,
Pay to Wilson Bear, or order,
Seven hundred and sixty-five dollars
for axle Co.

$765.

(Signed) J. A. Moore."

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Having a canceled 2-cent revenue stamp. Indorsed "Wilson Bear." And secondly:

"HARRISBURG, PA., *March* 31st, 1875

Harrisburg National Bank,
Pay to Wilson Bear, or order,
For draft of Isaac H. Shearman,
One hundred and eighty dollars,
Axle Co.
$180.
(Signed) J. A. Moore."

(Indorsed) Wilson Bear.

Having two canceled revenue stamps.

Explain, if you please, whether those are original checks, given on the dates which they respectively bear, and also explain for what and how they were given.

A. These are original checks, given on the dates they bear, for which I have entries on the book. Check of March 24th, 1875, was given to Wilson Bear, to pay his draft to Isaac H. Shearman, of whom were purchased two lathes and one milling-machine, with tools for each. There is a charge in our books of the payment to Isaac H. Shearman, of seven hundred and sixty-five dollars, for two lathes and one milling-machine, the book-entry being dated March 26th, 1875. The check of March 31st, 1876, was given to Wilson Bear, for draft of Isaac H. Shearman, for one drill-press, purchased of Shearman. There is also an entry here in the book of Isaac Shearman, Dr., to draft per Wilson Bear, for one drill-press, March 31st, one hundred and eighty dollars.

Q. 16. Please look at the check, which I now show you, and which is as follows, to wit:

"HARRISBURG, PA., *March* 30, 1875.

Harrisburg National Bank,
Pay to J. W. Lescure & Co., or order,
Sixty-five $\frac{96}{100}$ dollars
[*For axle Co.*]
$\$65.\frac{96}{100}$
(Signed) J. A. Moore."

Having a canceled revenue stamp, indorsed "J. W. Lescure & Co.," and state whether that was an original check given at its date, and for what it was given.

A. This is an original check, given at its date, for belting for the use of the machinery purchased of Isaac H. Shearman and others.

Q. 17. Please permit the examiner to copy on to the record the entries of all the business transactions which are there recorded between your old axle manufacturing concern and George W. Drawbaugh.

A. I will.

[*Examiner copies the following, which he certifies to be correct:*

“1875	G. W. Drawbaugh, Dr.		
May 14	To cash		10.00
June 17	“ “		7.25
			17.25
		Cr.	
May 19	By 11½ Days work @ $1.50		17.25

Q. 17½. I make the same request as to the account of John B. Drawbaugh with your said concern.

A. Here it is.

[*Examiner certifies that it is as follows:*]

1875.	Jno B. Drawbaugh, Dr.			
May 14	To cash		10.00	
April 20	“ “ (Stouffer)		15.00	
				25.00
		Cr.		
March 31	By 12 days work		21.00	
Apr. 30	“ 12½ “ “		21.87½	
May 31	“ 6½ “ “		11.37½	
				54.25

1875	Jno. B. Drawbaugh, Dr.	
Aug. 20	To check (J. A. Moore.)	29.85

Q. 18. I make the same request as to the accounts of Harman K. Drawbaugh.

A. Here they are

1875		H. K. Drawbaugh, Dr.	
May	14	To cash	5.00
“	29	“ “	2.00
June	4	“ “	10.00
		“ “	12.00
	25	“ check	20.00
July	13	“ “	10.00
Aug	11	“ cash (from Wilson Bear)	15.00
			74.00

Cr.

March 31	By 3 days work	4.50
Apr 30	" 22 2-10 " "	33.30
June 1st	" 20 6-10 " "	30.90
July "	" 24 3-10 " "	36.45
Aug "	" 21 4-10 " "	32.10
		137.25

1875	H. K. Drawbaugh, Dr.	
April 17	To cash per Bair	15.00
Aug 11	" " "	15.00
Nov 19	" " "	2.00
		32.00

Cr.

Nov. 10	By 41¾ days work to date @ 1.50	62.62
1875.	H. K. Drawbaugh, Dr.	
Sept. 24	To check per J. A. Moore	25.00
Oct. 23	" " " "	23.00
Dec. 10	" " " "	25.00
" 14	" " " "	35.87
1876		
Jan'y 17	" " " "	10.00
Feb'y 7	" " " "	15.00
" 5	" cash " Wilson Bear	2.00
" 12	" " " " "	10.00
Mar. 1	" " " J. A. Moore	3.00
		140.87

1876	Harman K. Drawbaugh	
Apr. 1	By 14 6-10 days work special Centennial axle @ 1.50	29.90
" "	66½ sett axles @ $1.00	66.50
" "	14-10 days work per "George" 1.50	2.20
		90.60
Apr 1	To check on acct. per Moore	25.00
	" error in count of axles	1.00
1876	H. K. Drawbaugh, Cr.	
Apr 21	By 45 Hours, on Centennial Axles at 15	6.75
	Dr.	
Apr 21	To check in full to date	24.35

Q. 19. I make the same request as to the accounts of Daniel Drawbaugh.

A. Here they are

[*Examiner certifies that they are as follows:*

Daniel Drawbaugh, Dr.

1875			
May 28th	To cash		$10.00
June 24th	" "	(Sweney)	80
" "	" "	(Repairing Reaper)	10
" 25	" "		20.00
April 7	" "	(From J. A. Moore)	25.00
" 28	" note		32.62
July 9th	" Order Eberly		15 00
February 18	" cash		2.00
March 13th	" "		7.00
March 22nd	" "		3.00
April 3d	" "		2.00
August 6th	" "	(From Bear)	5.00
			$122.52

1875	Daniel Drawbaugh, Cr.		
Jan.	By work		$11.10
Feb. 11	" "		65
March	" "		1.60
" 31st	" "	(17 days)	25.50
Apr. 30	" "	(25 ")	37.50
May 31	" "	(26 ")	39.00
June 30	" "	(25 4-10 ")	38.10
July 31	" "	(23 ")	34.50
			$187.95

1875.	Daniel Drawbaugh, Dr.	
August 6	To cash per J. A. Moore,	$5.00
Sept. 1	" cash " M. M. Grove,	10.00
" 6	" cash " W. Bear,	5.00
" "	" cash " J. A. Moore, (lathe) to Eberly	10.00
Oct. 11	" check, "	25.00
Nov. 19	" cash, "	5.00
" 24	" order to C. Eberly	20.00
Dec. 10	" check per J. A. Moore	25.00
" 14	" check " "	77.20
		$182.20
18	cash (dues to Grange)	5.50
1875.	Cr.	
Nov.	10 By 73 8-10 work at 1.75	$129.15

1875.	Daniel Drawbaugh, Cr.	
Feb.	By old bill of work before working by the day	$5.80
May	23 " 105 lbs. boiler iron for water-wheel at 3½,	3.67½
June	12 " 13 " sauders steel at 23c.	2.99
	12 " 14 ft. clear plank for patterns 4c.	56
	" " 31 lbs. mandrel iron 3½	1.08½

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June 12	By 11½ " Sanderson's steel 23	2.64½
" "	8 " " " "	1.84
15	" 120 inch pulley 30 lbs. at 5	1.50
" "	1 grind-stone frame	1.00
		$21.09½
1875		
Nov. 10 to 30,	By 14 days work at 1.75	$24 50
Dec. 31	" 20 1-20 " " "	35.08¾
1876.		
Jan. 31	" 17 11-20 " "	30.71
Feb. 28	" 10 " " "	17.50
Mar. 31	" 1	1.75
		$109.54¾
	Settlement to date, total	$130.64
Apr. 1	To check per Moore $119.94 (1 Sett axle 10.00 for Dr. Criswell.)	
1876.		129.94
May 22,	Daniel Drawbaugh, Dr. To Cash (per Moore) on order of H. K. Drawbaugh,	10.00
Sept. 14,	Daniel Drawbaugh, Dr. To check per J. A. Moore,	5.00
1876.	Daniel Drawbaugh, Dr.	
June 16,	To cash from Zimmerman for reaper repairs extra,	3.50
19,	" " " Gutshall " "	3.40
19,	" " " Lantz " "	2.00
		8.90
	Daniel Drawbaugh, Dr.	
Nov. 29,	To order of Dr. Criswell, Payable when due on settlement	20.00
1877.	Daniel Drawbaugh, Dr.	
Feb. 26,	To 19 days work of H. K. Drawbaugh on Centennial axles which were spoiled and thrown away @ 1.50,	28.50
1877.		
Apr. 1.	Daniel Drawbaugh, Dr. To rent and wear of machinery	10.00
1878.	Daniel Drawbaugh, Dr.	
Apr. 1.	To rent and wear of machinery, &c. for year ending to date,	10.00
1879.		
Apr. 1.	Daniel Drawbaugh, Dr. To rent and wear of machinery, &c., for year ending to date,	10.00

Q. 20. While you were connected with the business there, did Daniel Drawbaugh ever say anything to you about his talking-machine?

A. Yes.

Q. 21. Did he show you one of his talking-machines?

A. Yes.

Q. 22. About when was it, as near as you can remember, that he first showed you his talking-machine?

A. It was during the month of May, 1875.

Q. 23. Did he say anything about patenting the machine at that time? If so, what?

A. He did. He said that he was unable to procure a patent himself, and desired me to go in with him and get a patent for it.

Q. 24. Did he offer an interest in the invention to any one who would go in and get a patent?

A. Yes; he was anxious to have some one take hold of it with him who had the means to procure a patent and put it on the market. I was so fully engrossed with our own patent axle at the time that I told him I did not wish to go into any other new inventions. I would add, further, that we had also (I mean the firm) another patent journal, used for sewing-machines, reapers, &c, which ante-dated our patent on the axle, and which we were also manufacturing.

Q. 25. At that conversation with Mr. Drawbaugh, did he or not suggest any particular line of business in which he thought the talking-machines could be introduced?

A. He spoke of the use of it in cities to supersede the fire-alarm which existed at that day.

Q. 26. Please look at the machine "B" now shown you, and state whether or not he showed you that machine in connection with that conversation.

A. I believe this to be the exact machine which he showed me during that conversation.

Q. 27. Do you recollect whether or not the end of the box next to the magnet was closed at the time of that conversation?

A. It was closed with something thin, like a bladder, drawn tightly and tied around it like a drum-head.

Q. 28. Do you remember whether or not while you were engaged in business there, he had other talking-machines around in different parts of the shop?

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A. I never saw any in use. I saw a number of pieces of wood that were carved out in different shapes. I never had any conversation with him as to their use.

Q. 29. Did you feel much interest in his talking-machine at the time?

A. I did feel considerable interested in it, and told him, if it could be put to practical use, it would be a fortune to any person or persons who would succeed in bringing it out. I can't remember the words exactly, but that is about what I said to him.

Q. 30. Did you take interest enough in it to inquire about it afterwards, or to examine any of the machines that you saw lying about there?

[*Objected to as argumentative and ambiguous.*]

A. I observed him frequently working at machinery that I thought was connected with this same machine, though put up in different styles and different shapes. I was not well enough acquainted with his objects at which he was at work, nor his designs, at the time, to give an intelligible account of their working or what they were for. I made inquiry of him as to the purpose of a machine that was on a table in another room, which worked by a magnet, and pressed certain keys with the alphabet on, but I don't know the object of it now. I didn't examine any one that had reference to this talking-machine.

Q. 31. Are you able now to identify any of the machines that had reference to his talking-machine, other than the instrument "B," now lying on the table before you?

A. I do not think I could recognize any other.

Q. 32. When Drawbaugh spoke of using the talking-machine as a substitute for the fire-alarm telegraph, did he state how he thought of using the machine—whether by batteries, or by magneto-electricity?

A. He spoke of using it, as this was used, by an electro-magnet. This is the expression I understood him to use.

Q. 33. Please refer again to your account-books, and point out to the examiner whatever accounts may be there with Henry B. Musser, in order that it may be copied upon the record.

A. Here is a charge against Henry B. Musser, June 28, 1876, Dr.

To Pitman, one head and two heels,	15.00
" one new cast wheel,	75

That is all the account there is against Henry B. Musser on the books.

Q. 34. When was that account paid by Mr. Musser?

A. The credit is as follows:

1876. Henry B. Musser, Cr.

Aug. 29,	By cash for Pitman connections,	15.75

Q. 35. In what year was that paid?

A. In 1876, as shown by the entries in the books.

Q. 36. Do you know whether Mr. Drawbaugh is a man of bold and aggressive character, or whether he is an extremely sensitive and diffident man in his relations with people with whom he is not on terms of close intimacy, and in his business relations?

A. I know him to be the latter, extremely.

Q. 37. Have you been at Drawbaugh's shop since you closed your connection with the business there?

A. I have not, since I sold the machinery to Mr. Chellis.

Cross-examined by Mr. Storrow:

Cross-Q. 38. When did you sell the machinery to Mr. Chellis?

A. I could hardly answer that correctly, without referring to some other items in my book which refer to the sale. I have not that book here.

Cross-Q. 39. How much time elapsed between closing out the active part of your business and your sale to Mr. Chellis?

A. About three years and a half, I would suppose.

Cross-Q. 40. The paper of February 29, 1876, to which you have referred as the paper of dissolution, is the one, I suppose, which put the business into the hands of Mr. Grove and yourself, is it not?

A. Yes, sir.

Cross-Q. 41. Another paper, which you have produced, dated November 18th, 1876, transfers all the property to you, upon your promise to pay the debts. Did you go on under that paper and pay the debts and dispose of the property?

A. Yes, sir; that is correct. I could not tell the exact period between the first dissolution and the second. I thought it was about six months. In fact, from the spring of 1876, I had practically the whole concern in my hands. In fact, during the whole time, I was the only one who was solvent, and I took charge to wind up the concern to secure myself.

Cross Q. 42. You were treasurer of the concern from the outset, were you not?

A. Yes, sir; I acted as secretary and treasurer both.

Cross-Q. 43. Did Daniel Drawbaugh do any work for you after the beginning of March, 1876, and while you were attending to the business of repairing reapers during the harvesting season of 1876?

A. He did that of making those samples for the Centennial Exhibition, and repairing reapers; very little other business. I think he finished ten sets of axles during that period.

Cross-Q. 44. I don't find any work credited to him after March, 1876, in the account which was settled April 1st, 1876. Where is the credit for the work he did?

A. No, sir; I never had a settlement. I have his bill somewhere, which about squares the account. It was never carried on to the books.

Cross-Q. 45. How long have you had charge of the orphans' school?

A. I assumed control of it November 1st, 1867. The building belongs to me, and the State pays me a certain sum *per capita* for all expenses attending the maintenance and instruction of the scholars. From March 1st, 1875, to March 1st, 1877, I sold my controlling interest to another party, and resumed it again at the latter date.

Cross-Q. 46. How large a school is it?

A. I have at present two hundred and thirty-four pupils.

Re-direct by Mr. Hill:

Q. Q. 47. Was your Axle Company enterprise a financial success, or otherwise?

A. It was a financial failure. It was during the heavy depression in 1874-'5, and '6, and was the worst time that anybody could go into business.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 14th day of July, 1881.

FRED. M. OTT,
Examiner.

J. A. MOORE.

Adjourned until July 15th, 1881, at 10 o'clock, A. M.

July 15*th*, 11, A. M.

Examination resumed, pursuant to adjournment.

Present, same counsel as yesterday.

W. N. KLINE, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

I am forty-four years of age; I reside at Shiremanstown, Cumberland county; I am an insurance agent. I know Daniel Drawbaugh, of Eberly's Mills, and have known him since the 17th day of July, 1867. On that very day I got acquainted with him.

Q. 1. How do you fix the fact that you got acquainted with him on that day?

A. He was the patentee of a molasses faucet and a pump, and on that day I went to work for the Stevensons, and they were at work on the patterns, and he showed me how to make the patterns—explained the draft to me.

Q. 2. When did you first have any conversation with him about his talking-machine, or about the possibility of one man's talking to another while they were at a great distance apart?

A. Some time in the year 1867 or in the year 1868. I could not tell the exact time. We were putting up those faucets. They didn't appear to fit right. By blowing into those faucets, it made a peculiar sound. Then Mr. Drawbaugh said that the time would come that we would talk face to face at a great distance.

Q. 3. Do you mean, talk at a great distance, as though you were talking face to face?

A. Yes, that was the expression he give.

Q. 4. Did the peculiar sound in the faucet give rise to a talk on the character of sound—what makes sound, &c., and how it is made?

A. I am not so positive about the conversation, but I think that is what brought it about.

Q. 5. How do you fix that time as in 1867 or the beginning of 1868?

A. By the Time Books.

Q. 6. Did you do any work on the faucets after the spring of 1868, so far as you remember?

A. No, sir.

Q. 7. Did Mr. Drawbaugh say anything to you at that time about making experiments with a view to enabling a person to talk to another to a distance?

A. Not to my recollection.

Q. 8. When did you next have any conversation with him about talking to a distance as if face to face?

A. In the fall of 1877.

Q. 9. How do you fix that time?

A. I was building Mr. Wilson Bear's barn at Camp Hill that fall, and one evening, as I was about ready to go home, I met Mr. Drawbaugh on the pike, and we came into conversation. He was then telling how his talking-machine was working, and I questioned him then how he could talk such a distance as he said. He said it was done by electricity. Then he explained it fully to me as to how it works, but said he was too poor to get it patented; that if he could get some help, there was money in it. That is about all the substance of that.

Q. 10. Did that conversation occur while you were walking along on the road from Camp Hill to your destination?

A. Yes, sir: that occurred from Camp Hill to White Hill station, and at White Hill station we stood a long time and talked on the subject.

Q. 11. When and where did you ever see any of his talking-machines?

A. I saw his machines at his shop in the spring of 1879.

Q. 12. Was that the first time you had been at his shop since you worked on the old faucets that were made for the Company of which Mr. Gorgas was a member?

A. Yes, that was the first time. I had never been at his shop at all before.

Q. 13. Then you did not work for Mr. Gorgas' Faucet Company?

A. No, sir; I was working for another firm that made the patterns for the Gorgas Faucet Company.

Q. 14. Did Mr. Drawbaugh show you quite a number of talking-machines when you were at his shop in the spring of 1879, or not?

A. Yes, sir; he showed me quite a number.

Q. 15. Did he talk to you through any of them?

A. Yes, sir.

[*Question objected to as leading.*]

Q. 16. Please look at machine "P," now on the table before you, and state when and where you first saw that machine.

A. I saw this machine in 1879, in the spring, at Daniel Drawbaugh's shop. He showed it to me.

Q. 17. Are you able to identify the machine that you listened at when he was talking to you at that time?

A. Yes; it was a machine like this one here ["P."] If this ain't the machine, it was one just like it.

Q. 18. Show us how you used the machine, in listening.

A. I took this here, [witness takes up the mouth-piece attached to the free end of the flexible tube,] and put it right to my ear, and he talked into the short tube on the other side of the machine. That is the way I think he did.

Q. 19. Was the flexible tube of the same length as now, or not?

A. That I could not say. There was a short one, that he had in the first place. This was first. Then I put this to my left ear, and then I could not tell any more what he said. I mean, I don't remember the words that he spoke through it. Then he put it to my right ear, which is my deaf ear. Afterwards he wanted to show it more distinctly, and he took this tube off and he put a longer one on—perhaps six or eight feet long—and I put that to the ear in which I am hard of hearing, and he spoke into the other side of the instrument and said that Harrisburg was situated on the banks of the Susquehanna river. This was on the deaf ear. It was as distinct as could be. That is what makes me remember it, because I had not heard anything in that ear since I was a young man.

Cross-examined by Mr. Storrow:

Cross-Q. 20. Where did you live between 1867 and 1879?

A. In Harrisburg, and New Cumberland, Cumberland county.

Cross-Q. 21. When did you move to Shiremanstown?

A. In the spring of 1880.

Cross-Q. 22. Did you ever meet Drawbaugh between the time when you worked on the faucet patterns and the fall of 1877?

A. Yes, sir.

Cross-Q. 23. About how often?

A. That I can't tell.

Cross-Q. 24. Was it just once, or was it tolerably often?

A. I couldn't say whether it was one dozen or two dozen times that I met him in that time, because I met Drawbaugh often, but never had any conversation with him particularly on any subject.

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Cross-Q. 25. You say that when you met him on the road, and talked with him there in the fall of 1877, he explained to you "how it works." Tell me what that explanation was.

A. I couldn't just exactly go over the words any more. I rather disbelieved that you could hear the sound, and that you could understand at that distance, without tapping something like a telegraph. And then he said you could just speak into a tube, like I found it afterwards, and you could hear at the other end the very word that was spoken in.

Cross-Q. 26. Was that substantially the explanation he gave you of how it worked?

A. That is, to the best of my recollection now.

Cross-Q. 27. Please tell me anything else he ever said to you about talking-machines.

A. I don't know anything else in particular, except what he said at first in 1867, that I have already given.

Re-direct by Mr. Hill:

Q. Q. 28. When you had the conversation with him on the road in 1877, did he give you any idea how far he could talk from one person to another, so as to be understood, through his machine?

A. Yes, sir; I thought it was any distance, the way that he expressed himself.

Q. Q. 29. Did he say anything about its being used in place of the telegraph?

A. Yes, sir; he said it would be more convenient and cheaper than the telegraph.

Re-cross by Mr. Storrow:

Re-cross-Q. 30-31. When I asked you to tell me everything else he ever said to you about talking-machines, why didn't you tell me what you have just said in answer to Mr. Hill's question?

A. That is because I thought that your question related to the time between 1868 and 1877. There are many other things that I might tell, if the question was asked that would just hit upon the matter, and I could understand it.

Re-cross-Q. 32. Now, tell me everything else he ever said to you at any time about talking-machines.

A. That I couldn't do.

Re-cross-Q. 33. Tell me anything else he ever said to you at any time about talking-machines.

A. If the question is directly asked, I could answer directly, but the question is indefinite to me now. I don't know what to answer, I might, perhaps, know some things I did not say. If I was asked the question, I could tell you.

Re-cross-Q. 34. If you remember anything else he ever said to you about talking-machines, please to state it.

A. I don't just have any special knowledge just now, but, as I said before, there might be things that I have forgotten, and that if my mind was just drawn to it I could tell.

Re-cross-Q. 35. Do you remember anything else that he ever said to you about talking-machines?

[*Objected to, as already answered fully two or three times.*]

A. The answer above would do for that same question again, I suppose; because I answered that two or three times.

Re-cross-Q 36. Ain't you able to answer that question directly, yes or no?

A. I answered it to the very best of my recollections.

Re-cross-Q. 37. Please tell me anything else you remember that he ever told you about talking-machines.

A. I have answered that as complete as I was able. I couldn't answer yes or no, because I might have forgotten something, that, if my mind was carried to it, I would know it.

Re-cross-Q. 38. Can't you say anything else that he ever told you about talking-machines?

A. I don't think it is necessary for me to answer that question, because I have answered it so often already.

Re-cross-Q. 39. Is that the best answer you choose to give?

A. That is the best I can give under oath.

Re-cross-Q. 40. Was your oath to answer such questions as you thought necessary, or such as should be put to you?

[*Question objected to, as merely badgering the witness, he having already several times testified that he had given his best recollection of all conversations, but there might have been other things said in some of those conversations that he might be able to recollect if his mind was particularly drawn to them, but not otherwise.*

Counsel for complainants says, he wishes to find out what this witness's memory is worth when he is not subjected to leading questions.]

A. To tell the truth to the best of my recollection.

Examination taken, reduced to writing, and by the witness affirmed to before me, this 15th day of July, 1881.

FRED. M. OTT,
Examiner.

W. N. KLINE.

Adjourned for dinner until 2, P. M.

Examination resumed at 2, P. M., pursuant to adjournment.

Present, same counsel.

JACOB G. LANDES, *being produced, affirmed, and examined, saith:*

Examined by Mr. Jacobs:

My age is fifty-eight; my residence is Mechanicsburg; I am working at pattern-making here in Harrisburg, at the Harrisburg foundry and machine shops, on Allison's Hill, a branch of the Harrisburg car shops. I know Daniel Drawbaugh, of Eberly's Mills; I became acquainted with him in 1836, about the time my father moved to Eberly's Mills.

Q 1. Do you remember when Daniel Drawbaugh moved to Mechanicsburg?

A. He moved there in the spring of 1876.

Q. 2. In what month, if you recollect?

A. I think it was in the latter part of March.

Q. 3. Please state whether or not you had any conversation with him about his talking-machine soon after he moved to Mechanicsburg, and if so, how soon.

A. Yes, sir; we had a conversation. He told me about it, and it must have been not more than two weeks after he moved there; at least, not more than the second week in April.

Q. 4. Please give us that conversation as nearly as you can recollect it.

A. He told me that he had made a machine. He called it a talking-machine, or speaking-machine; I don't know which of those words he used. He said that he had tested it, and that he could hear distinctly—the distance of the length of Mechanicsburg was the distance he gave—

just as distinctly as though a person was talking in a room. That is about the idea he gave of it.

[*Answer objected to by Mr. Storrow as incompetent and irrelevant.*]

Q. 5. Did he tell you how far it could be used?

[*Same objection.*]

A. He spoke as if it could be used a thousand miles.

Q. 6. Did he describe the instrument to you pretty fully?

A. He gave me a description of it, but I couldn't get over it, more than he said that it worked by electricity.

Q. 7. With reference to its use, did he, or not, make any comparison between it and the telegraph?

A. Yes; he said it would take the place of the telegraph.

Q. 8. Did he, or not, say anything about taking out a patent on it? If so, what did he say?

A. He said he would like to take a patent out on it, and would take a patent out on it, if he could secure the means; or something of that kind.

Cross-examined by Mr. Storrow:

Cross-Q. 9. Did you ever have any other talk with Drawbaugh about his speaking-machine?

A. Yes, sir.

Cross-Q. 10. When was it?

A. It was some time after this conversation. It might have been six or eight months, that he said he was going to get it patented. He then expressed nothing concerning the means. He said that he had it so that he was going to get it patented.

Cross-Q. 11. Did you ever have any other conversation with him about it?

A. We have had conversations time and again, but I couldn't tell you when, nor to what extent. We had a conversation last fall. Then he showed me his talking-machine; that was the first time I had seen it.

Cross-Q. 12. Where was this conversation last fall?

A. In his shop at Eberly's Mills.

Cross-Q. 13. Who else was present?

A. There was his brother and one of his brother's sons there, and another young man that I didn't know. Mr. Chellis was there also, but only came after he had shown me this machine.

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Re-direct by Mr. Jacobs:

Q. Q. 14. In the second conversation which you have spoken of, six or eight months after the first, when he told you he was going to get the talking-machine patented, did he, or not, say that he then expected some one to help him ?

A. He spoke of having received assistance, or received some person to stand at his back, or something of that kind. I don't exactly recollect the words that he used.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 15th day of July, 1881.
FRED. M. OTT,
Examiner.

JACOB G. LANDES.

Adjourned for want of witnesses at 3.30, P. M., until July 16th, at 10, A. M.

July 16th, 11, A. M.

Examination resumed, pursuant to adjournment.

Present, same counsel as yesterday.

JOHN K. TAYLOR, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

My age is almost fifty-five; residence, Lower Allen township, within about a mile and a half of Eberly's Mills, Cumberland county; I am farming and trucking. I know Daniel Drawbaugh, and have known him since 1846. I haven't been about him much until about 1851. After that I lived right in the same village until 1860, when I moved away.

Q. 1. Did he pay you any money in the year 1867?

A. Yes, sir.

Q. 2. At what time in the year 1867?

A. About the middle of September.

Q. 3. After the Faucet and Pump Company commenced operations, or before ?

A. Yes, sir; they were in operation at the time.

Q. 4. How much did he pay you ?

A. I can't tell exactly, but it was between two and three hundred dollars, if my memory serves me aright.

Q. 5. Was it the balance of an old debt that had been due several years?

A. Yes, sir; it was the balance of an old debt that he had owed me for some years.

Q. 6. Do you remember being at his shop with Mr. Ezekiel Worley at one time?

A. Yes, sir.

Q. 7. How long ago was that?

A. As near as I can remember, it was eight years, if not more. It has not been under eight years.

Q. 8. Did he show you any talking-machines at that visit?

A. Not that I recollect of. He was telling us about his talking-machine.

Q. 9. What do you remember that he told you about it?

A. I don't remember anything more than that he was telling about the talking-machine—by electricity, or something of that kind.

Q. 10. Was that before or after Mr. Miller moved away from Eberly's Mills?

A. As near as I can remember, it was before.

Q. 11. How many times have you been at the shop since that visit?

A. I have been there twice, or so, that I can recollect of.

Q. 12. Did you stop long, or not?

A. I was there for a very short time.

Q. 13. Was Mr. Drawbaugh there?

A. He was there once, that I recollect of, and once that I was there, he wasn't there, I think—I am sure he wasn't.

Q. 14. What was he doing the once that he was there?

A. Him and a man I was not acquainted with, were making patterns for a faucet.

Q. 15. How long ago was that?

A. It was within the last two years.

Cross-examined by Mr. Storrow:

Cross-Q. 16. Don't you think you have been there more than twice in the last two years?

A. Those two times I recollect my errand; I might have been there oftener, but I don't recollect of it.

Cross-Q. 17. Did you ever meet Drawbaugh within the last eight years outside of his shop?

A. Yes, I have come across him.

Cross-Q. 18. Did you ever have conversation with him about talking-machines other than what you have already stated?

A. I think we had some, the last year or so; before that I don't think we had, because I saw him so very little. The election is held at my place, and I would generally see him when he came to elections. I might have, perhaps, seen him between those times occasionally. I would just exchange a word or two with him—that is all.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 16th day of July, 1881.
FRED. M. OTT,
Examiner.

JOHN K. TAYLOR.

Adjourned until 2, P. M.

Examination resumed at 2.30, P. M., pursuant to adjournment.

Present, same counsel.

WILSON BEAR, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

My age is forty-one; residence, Camp Hill, Cumberland county; occupation, dealer in cattle. I know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, and have known him about eighteen or twenty years.

Q. 1. Are you the Wilson Bear who was in partnership with Messrs. Jacob Kline, M. M. Grove, and J. A. Moore in the axle business?

A. Yes, sir.

Q. 2. Prior to taking Mr. Grove and Mr. Moore into that partnership, you and Mr. Kline had become interested together in the patent on the harvester crank-pin or spindle, had you not?

A. Yes, sir.

Q. 3. At what time did you and Mr. Kline become interested together in that patent?

A. The 19th day of June, 1874.

Q. 4. State whether or not you had Mr. S. C. Crawford in your employ before Mr. Grove and Mr. Moore became interested in the business.

A. Yes, sir; I had.

Q. 5. If you have your original account-books here, please refer to them, and point out to the examiner all the payments made by you to

Mr. Crawford, prior to December 23, 1874, in order that he may copy them upon the record.

A. "November 13, 1874, Samuel Crawford to C. $2.45; November 21, Sam Crawford to cash, $2.00." Those two items are the only ones prior to that date. After December 23d, Mr. Crawford is charged with some payments made by me on account of work done prior to that date. The charge of November 13th, 1874, is the first payment made to Mr. Crawford.

Q. 6. When did Mr. W. Kline build a barn for you?

A. In the fall of 1877.

Q. 7. What is the first payment to him, on that account, shown by your book?

A. November 10th, 1877.

Q. 8. Were you ever at Mr. Drawbaugh's shop prior to becoming interested with Mr. Jacob Kline in the patent above referred to?

A. I don't know that I was.

Q. 9. Between the time when you became interested with Mr. Kline in that patent and the time when the affairs of the Axle Company were wound up, did you know anything about Mr. Daniel Drawbaugh having a talking-machine invention?

A. I know of him showing me, in one of the rooms of the building,—a place in the building, as I remember that he did not invite every one into, to show his inventions. I remember of seeing wires in this room. The recollection of them that I have is that they ran down through the floor, and I remember of seeing other machinery, and cannot say exactly what they were to be used for, as I take very little interest in patent-rights. I have no doubt, as Mr. Drawbaugh has explained to me often about his inventions, that he spoke of his talking-machines.

Q. 10. Have you any recollection, or impression on your mind, of Mr. Drawbaugh's asking you to take an interest in his invention of a talking-machine, and furnish capital for patenting and introducing it?

A. I have a faint recollection.

Q. 11. What is your impression as to the time when you did that?

A. At the time when we were manufacturing axles—the Axle Company.

Cross-examined by Mr. Storrow:

Cross-Q. 12. What explanation did he give you about his invention?

A. Mr. Drawbaugh often explained to me about his inventions, and told me about them, but I was so little interested in these things that I really paid no attention to them, and can't tell now what his explanation was. I remember seeing one of his instruments.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 16th day of July, 1881.
FRED. M. OTT,
Examiner.

WILSON BEAR.

DANIEL FETTROW, *re-called, saith:*

Re-cross examination by Mr. Storrow:

Re-cross-Q. 1. Please to tell me the names of the people who lived at Eberly's Mills in 1874–'5 and '6.

A. That is a question that I can't answer just now, because there were changes in every year.

Re-cross-Q. 2. Tell me who you remember that lived there in those years.

A. I lived there. I could tell by reference to the charges in my books. J. B. Drawbaugh lived there—does yet. William Heck, Daniel Drawbaugh, [*at Mr. Storrow's request the books of witness are sent for and brought in. Witness then continues:*] Daniel Hart, John Rennard, lived there in 1874 and '5; Geo. W. Drawbaugh lived there ever since I am there. Dellinger lived there in 1878. If I had known you wanted that, I guess I could have helped you out with the whole of it. The books I kept my smaller charges in are not here.

Re-cross-Q. 3. Will you please send in to the magistrate, to be annexed to your deposition, a list of the people who lived at Eberly's Mills in 1873, '4, '5, and '6, using your books to assist your recollection, if you want to, but including the people whom you remember as having lived there, even though you did not do any work for them?

A. I will do that.

Re-cross-Q. 4. Do you remember an explosion of gun powder that took place in the store there, and if so, when was it?

A. I remember of it. I can't tell, till I go back and see the date. Then I can.

Re cross-Q. 5. Will you please add that date to the other information that you are going to bring?

A. I will do that.

Re-cross-Q. 6. Do you remember Mr. H. C. Springer, a shoemaker, who used to live there?

A. Yes, sir.

Re-cross-Q. 7. Where was his shoemaker-shop?

A. Right opposite from my shop, across the street.

Re-cross-Q. 8. Did he live in the same building where his shop was?

A. No.

Re-cross-Q. 9. Where did he live?

A. He lived further down town.

Re-cross-Q. 10. Did you know a man by the name of John Weber?

A. Yes, I knowed one by the name of John Weber.

Re-cross-Q. 11. Was he a relation or connection of H. C. Springer?

A. I can't tell that. I never made any inquiry.

[*Examination of Mr. Fettrow suspended. July 16th, examination resumed.*]

[*Mr. Fettrow says.*] I name the following persons as inhabitants of Eberly's Mills, in addition to those already named.

George Leonard came in 1871 and left in 1877.
E. F. Gilbert, 1867 'till now.
Jacob K. Metz, 1874 'till 1875.
Jeremiah Fry, 1873 'till 1880.
Wm. S. Dellinger came in 1876, left April, 1881.
Amos Frownfeldter " " 1871, " in 1873.
John Rennard " " 1874, " in spring 1876.
H. C. Springer " " 1876, left in the fall.

The store exploded in 1874, in December, or in January, 1875.

Re-re-direct by Mr. Hill:

Q. Q. Q. 12. Captain Moore, who was connected with the Axle Company, was a son-in-law of Jacob Kline, was he not?

A. Yes, sir.

Q. Q. Q. 13. Mr. Kline had another son-in-law named Bowman, hadn't he?

A. Yes, sir, he had; but I don't know which Bowman it is, whether Harry or George; I think it is George.

Q. Q. Q. 13½. You have put down Jeremiah Fry as residing there

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from 1873 'till 1880. Mr. Fry testifies that he moved there about the last of March, 1875. Who do you think is correct, you or Mr. Fry?

A. I have got him charged in my book that I had over here for work done in 1873. That is where I got it, or else I am very wrong, if it was not in 1873. In 1876, I took possession of the property that I own now, and he lived in a house right opposite to me, that is now torn down, one year. Then he moved to the new store-house one year, and I think from spring to July, somewheres along there—I am not positive about that. Then he moved into my house, and lived the balance of the year there. From there he moved across to another house in the spring. I am not sure whether he lived there the whole year or not; but then he moved back to the store house again.

Q. Q. Q. 14. Please get your book and show me the entry charged in 1873.

A. It is in the little book that I took home; I haven't it with me now.

Q. Q. Q. 15. Will you produce it at some time hereafter for further examination?

A. I will.

[*Re-re-direct examination of Mr. Fettrow suspended.*]

Re-re-direct examination of Mr. Fettrow resumed by Mr. Hill:

Q. Q. Q. 16. Since the adjournment this morning, you came to me and stated that you wished to make a correction in your testimony as to Mr. Jeremiah Fry. You have now the opportunity to do so.

A. Fry is correct as to 1875. That is right. The way I came to find it out, I bought hogs at his sale, for Mr. Daniel Drawbaugh, and Drawbaugh got Jacob Metz's horse and sled to fetch the hogs, and Metz lived, at the same time, in Milltown. I guess that is all. The charge in the book, found to be 1873, is that I done work for him when he lived on Oyster's farm, before he moved to Milltown, and when I hunted the dates up, I did not think of that charge made before he moved to Milltown.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 16th day of July, 1881.
FRED. M. OTT,
Examiner.

DANIEL FETTROW.

Adjourned until Thursday, July 21st, 1881, at 10, A. M.

Thursday, July 21st, 10.30, A. M.

Examination resumed, pursuant to adjournment.

Present, Mr. Storrow for complainants and Mr. Hill and Mr. Jacobs for respondents.

WILLIAM SENSEMAN, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

My age is forty-three years; residence, Boiling Springs, Cumberland county; occupation, dealing in horses at the present time. I know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, and have known him since the spring of 1872.

Q. 1. Did you formerly live at Eberly's Mills? If so, from what time to what time?

A. I did. From the spring of 1872 to April, 1873; from April to April.

Q. 2. In renting real estate in Cumberland county, is it the custom to rent from the first of April to the first of April?

A. That is the custom; yes, sir.

Q. 3. While you were living at Eberly's Mills, were you ever in Daniel Drawbaugh's shop there?

A. I was; different times.

Q. 4. State whether you have ever been in his shop since you moved away from Eberly's Mills, the first of April, 1873.

A. I have not.

Q. 5. While you were living at Eberly's Mills, did you have any conversation with Mr. Drawbaugh about his talking-machines?

A. Yes, sir.

Q. 6. Did he at that time, while you lived there, show you any of his talking-machines?

A. He did.

Q. 7. Did he talk to you through any of them, or not?

A. He did; through a small tube, or tin can, or something he had, from a small room up-stairs.

Q. 8. Where were you and where was he, while he was talking?

A. I was down in the cellar, or basement, or something of that kind; he was in a small room up-stairs.

Q. 9. Was he on the next floor above the cellar?

A. No, sir; on the second floor above the cellar.

Q. 10. Could you hear and understand through the machine what he said to you?

A. I could hear, and some of the words I could understand.

Q. 11. Please look at the machines "B," "F," "C," and "I," and state whether you ever saw them before, and if so, when and where you first saw them.

A. Those are the machines I seen in the shop there, or up-stairs in that room where he generally worked.

Q. 12. While you were living there at Eberly's Mills, was Mr. Drawbaugh working and experimenting with his talking-machines, or not?

A. He was.

Cross-examined by Mr. Storrow:

Cross-Q. 13. Were these four instruments in the same condition when you saw them that they are in now?

A. Very nearly.

Cross-Q. 14. What was the difference?

A. I couldn't say. They look about the same to me that they did when I seen them. I didn't examine them closely.

Cross-Q. 15. What other machines did you see there that you understood were talking-machines?

A. I don't remember seeing any others, particularly, there, except these I remember very well.

Cross-Q. 16. How often did you go to his shop while you lived there?

A. I can't say. I used to go there frequently. I only lived about a half mile from there.

Cross-Q. 17. Was it one of these instruments you listened at on the occasion you have described?

A. I suppose it was. Of course, I was down-stairs, and they were up.

Cross-Q. 18. Did you take the instrument in your hand and put it to your ear, when you listened at it?

A. No, sir; I did not. I just put my ear to the instrument.

Cross-Q. 19. Was it one of these instruments you put your ear to?

A. That I can't say positively. You know it was in 1873.

Cross-Q. 20. Was the instrument you listened at like one of these four? If so, which one?

A. It was something of the kind. I wouldn't say positively it was one of them.

Cross-Q. 21. How did he come to talk to you on that occasion?

A. I used to visit him, and he told me his idea was to convey sound, and he thought he could do it. That he had made different machines, but had never made anything out of it.

Cross-Q. 22. And it was after the talk between you about conveying sound, and after you and he had conversed several times about what he had done, that he talked through the machine to you, was it?

A. Yes, sir.

Re-direct by Mr. Hill:

Q. Q. 23. In your 21st cross-answer, you say he told you he had made different machines, but had never made anything out of it. What kind of machines—talking-machines, or other machines?

A. That he didn't say.

Q. Q. 24. What do you mean by his never making anything out of it?

[*Objected to for the reason that it is for the witness to state what he heard, and not to construe it.*]

A. That he had invented different machines, but was always too poor to carry it out and to get a patent on it.

Q. Q. 25. Is that what he said?

A. That is what he told me.

Q. Q. 26. Then, by never making anything out of it, did you understand him to mean that he had never made any money out of it?

[*Objected to as above, and as leading.*]

A. Yes, sir; that is what he was telling me.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 21st day of July, 1881.
FRED. M. OTT,
Examiner.

WM. SENSEMAN.

WILSON N. MILLER, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

My age is twenty-five; residence, Shiremanstown, Cumberland county; occupation, clerking. I know Daniel Drawbaugh, of Eberly's Mills, and have known him since 1873, personally, but knew of him before that.

Q. 1. What is your father's name?

A. J. R. Miller.

Q. 2. Did your father formerly run the mill situated a short distance above Eberly's Mills, on the Yellow Breeches creek, and known as Miller's mill?

A. Yes, sir.

Q. 2½. How far is Miller's mill above Eberly's Mills?

A. I guess not more than two miles.

Q. 3. From what time to what time did your father run the mill known as Miller's mill?

A. From 1866 to the month of March, 1873.

Q. 4. What did your father do after he left the Miller's mill?

A. Went into the forwarding business, at Shiremanstown, and also run the mill at Milltown.

Q. 5. How long did he run that mill at Milltown?

A. One year. During that year, he had a partner with him—George Eichelberger. The firm was known as Miller & Eichelberger.

Q. 6. Do you remember the date when that firm ceased to run that mill at Eberly's Mills?

A. The first of April, 1874.

Q. 7. Do you know a man named Jeremiah Kohler?

A. I do.

Q. 8. Was he employed at any time by your father, or by the firm of Miller & Eichelberger?

A. He was, by both parties. He was employed before he went to Eberly's Mills, and after he went there.

Q. 9. Do you mean that he was employed at Miller's mill by your father?

A. He was employed at Miller's mill by my father, and at Eberly's Mills by Miller & Eichelberger.

Q. 10. Up to what time was he employed at Eberly's Mills by Miller & Eichelberger?

A. I think he was there during the whole time, up to the first of April, 1874.

Q. 11. Was your father, at one time, railroad station-agent at White Hill station?

A. No, sir.

Q. 12. You were the station-agent there at one time, were you not?

A. Yes, sir.

Q. 13. From what time to what time were you station-agent there?

A. From June, 1876, to April, 1878.

Q. 14. Prior to June, 1876, were you employed at the station there?

A. No, sir; I wasn't employed at the station, but at the warehouse, close by the station, and run by my father.

Q. 15. When did you first begin to be employed at said warehouse?

A. In January, 1876.

Q. 16. Were you employed there until you became station-agent at the railroad station?

A. Yes, sir; and then I continued to be employed at both the station and warehouse.

Q. 17. Where was your father employed during that time, from January, 1876, to April, 1878?

A. He was in the forwarding business for himself, at Shiremanstown and White Hill. I was employed by him at White Hill.

Q. 18. Do you recollect the fact that Daniel Drawbaugh resided at one time in Mechanicsburg?

A. I do.

Q. 19. Did he used to go back and forth on the railroad from Mechanicsburg to White Hill during that time?

A. Yes, sir.

Q. 20. Do you recollect the fact of his showing you a talking-machine that he had in his hand as he was about to take the train at one time, while he lived at Mechanicsburg?

[*Objected to as leading and assuming.*]

A. He had a talking-machine one evening as he took the train to go to Mechanicsburg.

Q. 21. Did you have any conversation with him about it at that time?

A. Yes, sir; but I don't remember what it was.

Q. 22. While he was living at Mechanicsburg, did you have any conversation with him about furnishing a talking-machine for you for use for your business purposes?

[*Objected to as leading.*]

A. Yes, sir; he said he would put up a line between White Hill and Shiremanstown, if I could get the use of the poles.

Q. 23. What poles?

A. The telegraph poles along the railroad.

Q. 24. For whom did he propose to put that line—for whose use?

A. For our use—in my father's business.

Q. 25. Where were the instruments to be located?

A. Nothing was said about that. I was to have one at White Hill, and my father was to have the other at Shiremanstown; but nothing was said as to whether the instrument was to be put in the station or warehouse.

Q. 26. State the substance of that conversation, as nearly as you remember it.

A. I asked him about what it would cost to put a line up there, and whether he thought that we could use it that distance. He said we could and a great deal farther than that. He said he didn't know at that time what it would cost. He said afterwards that it would cost twenty-five dollars or thirty dollars, if we could get the use of the poles. I promised him I would find out whether we could get the use of the poles, and at the same time I was doubtful whether I would stay there any length of time. I never made any inquiry about the poles. He asked me several times whether I saw those parties about the poles. I told him I did not, but kept him under the impression that I would.

Q. 27. Who was to furnish the wire and the instruments in case you got possession to put up the line?

A. He said he would furnish everything—Drawbaugh.

Q. 28. Prior to his showing you the instrument at the railroad station, had you ever had any conversation with him about his talking-machines?

A. Yes, sir; but I was so little interested that I don't know what it was any more. I might say that my business there was about some money that he owed my father for coal. In the conversation, I found that he had no money, and I didn't ask him for it.

Q. 29. Referring to the time when he showed you the talking-machine at the railroad station, do you remember whether that was about the time when he first began to live at Mechanicsburg, or not?

A. I don't remember.

Q. 30. Referring to the time when you first talked about putting up the line from White Hill to Shiremanstown, do you remember whether that was about the time when he first began to live at Mechanicsburg, or not?

A. I don't remember. It was in the summer, but I can't remember what month.

Cross-examined by Mr. Storrow:

Cross-Q 31. Please to describe the instrument you say he showed you at the station.

A. I don't know whether I can, exactly.

Cross-Q. 32. Tell me what you remember about it.

A. It was a small wooden box, with a tube to it, to talk in. As near as I can tell, it was about five or six inches across, and about an inch and a half thick.

Cross-Q. 33. In your twenty-eighth answer, you testified about furnishing the wire and the instruments, that Drawbaugh said he would furnish everything. Who was to pay?

A. I was; when I say everything, I do not include the poles.

Cross-Q 34. When did you first talk with Drawbaugh or any of the counsel about testifying in this case?

A. That was in the winter, but I don't remember what time.

Cross-Q. 35. Did you make an affidavit at that time or any time?

A. I made an affidavit as to the time when my father moved from Miller's mill to Shiremanstown.

Cross-Q. 36. Did you say anything in that affidavit about any talk with Drawbaugh about his talking-machine?

A. No, sir.

Cross-Q. 37. Did you say anything to Mr. Drawbaugh or Mr. Jacobs at that time about having had any talk with him concerning his talking-machine, or concerning the line?

A. No, sir.

Cross-Q. 38. When did you first tell any of them about this talk with Drawbaugh concerning the talking-machine or concerning the line?

A. I didn't tell them anything about the line, until to-day I called their attention to it.

Cross-Q. 39. Where were you to day when you called their attention to it?

A. In Lawyer Jacobs' office.

Cross-Q. 40. At Mr. Jacobs' office, did they show you any machines which they said were Drawbaugh's talking-machines?

A. Yes, sir.

Cross-Q. 41. Is your father living?

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A. Yes, sir.

Cross-Q. 42. Is Mr. Eichelberger living?

A. Yes, sir.

Cross-Q. 43. Where did Jeremiah Kohler go to after he stopped working for the firm at Eberly's Mills?

A. He went to Shiremanstown.

Cross-Q. 44. Did he continue to work for your father?

A. No, sir.

Re-direct by Mr. Hill:

Q. Q. 45. When Mr. Jacobs took your affidavit last winter, did he ask you about anything except the time when your father moved away from Miller's mill?

A. No, sir.

Q. Q. 46. When you were in Mr. Jacobs' office this morning, did you speak about the machine that Mr. Drawbaugh showed you at White Hill station before Mr. Jacobs brought in the talking-machines for you to look at?

A. Yes, sir.

Q. Q. 47. When Mr. Jacobs then brought in the talking-machines for you to look at, were you able to positively identify any one of them as the machine that Mr. Drawbaugh showed you at White Hill?

A. There was one there, I remember, that looked like the one I saw, but I couldn't say positively that it was the same one.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 21st day of July, 1881.
FRED. M. OTT,
Examiner.

WILSON N. MILLER.

Recess for dinner until 2, P. M.

4.30, P. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

WILLIAM L. GORGAS, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

I am thirty-three years of age; residence in Harrisburg, Pa.; I am a

Bank clerk. I know Daniel Drawbaugh, of Eberly's Mills, and have known him ever since I was a boy.

Q. 1. Are you a book-keeper in one of the Banks here in Harrisburg?

A. Yes, sir.

Q. 2. Were you formerly connected with the Drawbaugh Manufacturing Company, that was at once time manufacturing faucets and pumps at Eberly's Mills?

A. I was.

Q. 3. How many full members were there in that company originally?

A. There were nine.

Q. 4. How many full members were there in the Pump Company, that immediately preceded the Drawbaugh Manufacturing Company?

A. There were six.

Q. 5. Explain how the membership came to be increased to nine, and the name of the company changed.

A. The Pump Company took in Messrs. A. H. Gardner, Joseph Hursh, and myself, as the owners of Drawbaugh's patent for the faucet, and the company was then merged into the Drawbaugh Manufacturing Company.

Q. 6. Do you mean that the three persons owning the faucet patent assigned their patent to the Pump Company, and became members of said company, and that the concern thus consolidated together was thereafter known as the "Drawbaugh Manufacturing Company?"

A. Yes, sir.

Q. 7. Up to what time did that company continue to manufacture and sell faucets and pumps?

A. I think up to the time of the sale to Hauck Brothers & Co.

Q. 8. When did you cease to be a member of that company?

A. After I left the shop, which was in September, 1869, I took very little interest in the affairs of the company, and my father, some time after that,—I am unable to fix the date,—assumed my interest.

Q. 9. Have you here the account-books of that concern, including the day-book or day-books, and ledgers?

A. Yes, sir.

Q. 10. Will you please make and put in evidence a copy from the day-book, and also a copy from the ledgers, of all the charges in favor of and against Daniel Drawbaugh, continued on those books, or any of them, from the time when the Pump Company was started, in 1867, to the time when its affairs were finally settled and closed up in 1876?

A. Yes, sir; here they are.

[*Examiner marks the copies respectively,* "*Exhibit Gorgas, No.* 1," *and* "*Exhibit Gorgas, No.* 2."]

Q. 11. Have you here present with you the original minute-book of the company?

A. Yes, sir.

Q. 12. Please examine said minute-book with reference to an entry that I find therein, setting forth the proceedings of a meeting of the Drawbaugh Manufacturing Company on the first of May, 1876, and signed "M. B. Mosser, secretary and treasurer," and state whether you knew Dr. M. B. Mosser.

A. I knew him; he is now dead.

Q. 13. Were you acquainted with his handwriting?

A. I am.

Q. 14. Please examine the minute of the meeting of May 1st, 1876, referred to in my twelfth question, and state whether it is in his handwriting or not.

A. It is.

[*Mr. Hill requests the examiner to copy the minute upon the record, and put it in evidence as* "*Exhibit Gorgas, No.* 3."]

Q. 15. Have you examined the day-book, minute-book, and ledgers of said company with reference to the profits and losses of said concern from the time when it began, early in 1867, till its winding up in May, 1876?

A. Yes, sir.

Q. 16. Was the concern financially successful, or otherwise?

A. It was not successful.

Q. 17. What do you find to have been the aggregate loss of each of the six full members who originally started the enterprise?

A. From my examination, I find it to be about fifteen hundred dollars.

Q. 18. Is that in addition to the amount that was originally paid for the pump patent?

A. Yes, sir.

Q. 19. Daniel Drawbaugh was one of the original six full members, was he not?

A. Yes, sir.

Q. 20. From an examination of the books, how much does it appear that Mr. Drawbaugh actually paid into the concern in cash, as assessments and installments, from the beginning of the business to its winding up?

A. The actual cash that he paid in was twelve hundred and ten dollars. The first seven items on the credit side of the first ledger account are the items that make up this amount.

Q. 21. What amount was Mr. Drawbaugh, as a full member of the company, called upon to pay, by way of assessments and installments, and interest thereon, as shown by said books, from the beginning of the operations in June, 1867, till the winding up of the business?

A. Twenty-one hundred and eighty-six $\frac{33}{100}$ dollars. The items are as follows:

1868.

Oct. 31. Installments charged as follows:

1867,	June 27,		$300.00
	July 22,		100.00
	Oct. 19,		250.00
	Dec. 17,		200.00
1868,	Jan. 3,		100.00
	April 16,		350.00
1869,	July 5,		125.00
1870,	April 1,		500.00
		interest,	30.00
1871,	March 1,		200.00
1873,	July 19,	interest,	31.33

All the installments, except the interest charge of July 19th, 1873, thirty-one dollars and thirty-three cents, were charged to each of the full members at the same time. The reason why the first six installments were all entered on October 31st, 1868, was because there had been a neglect to enter them upon the account-books prior to that time.

Q. 22. Upon examining the assessments called for from Mr. Drawbaugh, I find the amount two thousand one hundred and eighty-six dollars and thirty-three cents, while his cash payments on installments and assessments aggregate only one thousand two hundred and ten dollars, leaving a balance of nine hundred and seventy-six dollars and thirty-three cents due from him to the company by way of installments and assessments, which he did not pay in in cash. Will you state how that nine hundred and seventy-six dollars and thirty-three cents was paid in?

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A. It was paid in by labor which he did for the company, and by a payment in cash at the distribution July 19, 1873.

Adjourned until July 22d, at 10, A. M.

July 22d, 1881, 10, A. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Q. 23. Will you please examine the books and state what is the aggregate amount that Mr. Drawbaugh's labor came to, during the whole time that he was connected with the concern, so far as the books show, referring to the minute-book as well as the day-book and ledgers?

A. I find by a minute of July 25, 1870, that a settlement was made with Mr. Drawbaugh for services up to April 1st, 1870. Mr. Drawbaugh agreed to take $1,000 00, less $115 00, "for labor performed for the company since its organization, including all claims in full against the company up to April 1st, 1870." The day-book, however, shows an entry of July 25th, 1870, "D. Drawbaugh, by labor and material, to the amount of $1,000 00 less $130 00, as upon the minutes, being due him for all claims up to April 1st, 1870," making $870 00. The minutes of May 1st, 1876, show a final settlement with Mr. Drawbaugh for labor and all claims of $51 13 due him.

[*Mr. Storrow objects to the statement by the witness of the contents of the book, unless the entries themselves are put in evidence.*]

[*Mr. Hill replies that the contents of the account-books and the minutes of the meeting of May 1st,* 1876, *are already in evidence and he now requests the examiner to copy and file in evidence as "Exhibit Gorgas, No.* 4," *the minutes of the meeting of July 25th,* 1870, *referred to by the witness in his last answer. The witness says that the minute of the meeting last mentioned is signed by Dr. Mosser, already referred to, and is in his handwriting.*]

Q. 24. What I want to get at is the aggregate amount that Drawbaugh's labor came to, without regard to the off-sets or credits.

A. The minute of the meeting of July 25, 1870, shows that D. Drawbaugh presented a labor bill that was liquidated at one thousand dollars. But my recollection is that the bill he brought in at that time was a little more than that. I don't recollect how much more. This was talked over at the meeting. The deduction of one hundred and fifteen dollars from the one thousand dollars was the result of a compromise. I was not present at the meeting, but I knew at the time. The minutes of May 1st, 1876, show that Drawbaugh presented a bill for labor of four hundred and seventy dollars and eighty-seven cents, but two hundred and ninety-two dollars and twelve cents of that amount had been settled or paid in the settlement of July 25, 1870, leaving the difference between those two amounts, one hundred and seventy-eight dollars and seventy-five cents, for labor from April 1, 1870, up to May 1, 1876.

Q. 25. Why was the one hundred and fifteen dollars deducted by compromise, July 25, 1870?

A. The company thought they were paying Mr. Drawbaugh enough, and thereby secured this compromise.

Q. 26. Then the eight hundred and eighty-five dollars allowed to him for labor, July 25, 1870, and the one hundred and seventy-eight dollars and seventy-five cents allowed to him for labor, May 1, 1876, amounting in the aggregate to ten hundred and sixty-three dollars and seventy-five cents, represents, if I understand you correctly, all the labor that Mr. Drawbaugh performed for the company, and for which he was allowed pay, from the beginning of its operations in June, 1867, to the end of its operations in May, 1876. Am I correct?

A. Yes, sir.

Q. 27. Having now gotten at the amount of labor that Mr. Drawbaugh performed for the company, I desire to ascertain how much was actually paid Mr. Drawbaugh on account of such labor, outside of the charges for assessments and installments, and outside of the amount that was apportioned to him from the sale to the Haucks, and outside of the fifty-one dollars and thirteen cents that was paid him on the settlement of May 1st, 1876.

A. The only payments he received during that whole time were as follows, some being cash actually paid him by the company, and other things equivalent to cash, such as money belonging to the company, which he collected and retained, and pumps, &c., for sale, and sundry small articles for his individual use:

1867,	Dec.	11,	To 2 pumps,	$115.00
1868,	Feb.	4,	" work done in the shop,	1.00
	Mar.	27,	" one file, for his use,	40
	May	15,	" one faucet,	3.50
	June	25,	" fixing reaper, Smith,	1.20
	Nov.	19,	" money received from Fisher & Son,	5.90
	Dec.	10,	" 3 hours lathe work,	1.20

1869,	Jan.	29,	"	1 file and 1 tram, for H. Snell,	$10.80
	Feb.	22,	"	1 red staff for tram, furnished to Michael Hurst,	2.00
	"	23,	"	1 file,	.75
	Mch.	16,	"	15 hours work on nail-feeder,	6.00
	"	20,	"	1 file,	.80
	"	26,	"	1½ hours lathe-work,	.60
	April	6,	"	lathe-work,	.80
	May	3,	"	2 lbs. babbitt metal,	.44
	"		"	use of lathe on T. James' work,	3.00
	Dec.	20,	"	turning gas pipe taps, 5½ hours,	2.20
1870,	Aug.	3,	"	blower castings as per Hauck's bill,	6.15
1871,	Jan.	10,	"	H. Gilmore, as per bill of D. Drawbaugh, interest four years on $16.00, $3.84,	19.84
	June	5,	"	shafting sold the company that was previously paid for	16.00
1870,	July	25,	"	D. Drawbaugh to bill of Natcher & Son,	1.38
	Aug.	23,	"	cash received from Eichinger,	$1.20
	Aug.	30,	"	4 ft 2½ inch gas pipe @ 90 cts.	3.60
	Sept.	9,	"	cash from Hummel for repairs on faucet,	.35
	Dec	13,	"	cash from John Eichinger,	1.00
1871,	Feb.	8,	"	bill of Groceries, George Brinton,	4.22
	May	4,	"	bill of castings,	18.00
1873,	July	24,	"	1900 lbs. coal @ $4.75, on Jan. 7, 1871,	4.52

Those are all the items that enter into the account on the ledger. The aggregate is two hundred and forty-one dollars and eighty-five cents.

Q. 28. Please state separately the aggregate for each year, from 1867 to 1871, inclusive.

A. The aggregate for 1867 is one hundred and fifteen dollars; for 1868, thirteen dollars and twenty cents; for 1869, thirty-seven dollars and thirty-nine cents; for 1870, thirteen dollars and sixty-eight cents; for 1871, sixty-two dollars and fifty-eight cents.

Q. 29. Were there any dividends of profits paid to any of the members at any time or any dividend of profits declared by the company?

A. No, sir; my recollection is very vivid about that.

Q. 30. When, and for what sum of money, did the company sell out to the Haucks?

A. The day-book shows an entry of July 15, 1873, "By cash from Hauck Brothers & Co. for factory, machinery, tools, &c., seven thousand."

Q. 31. What was done with that seven thousand?

A. After paying off the debts, a distribution was made, each full member receiving six hundred and fifty dollars.

Q. 32. Did Daniel Drawbaugh receive six hundred and fifty dollars, or any part thereof, and if either, how much and when?

A. He received the difference between the charge and the credit of that date, July 19, 1873. The meeting for distribution was held July 19th. The balance he received was four hundred and twenty-five dollars.

Q. 33. Do you understand, then, that the three sums of two hundred and forty-one dollars and eighty-five cents, representing the aggregate moneys paid to Drawbaugh from 1867 to 1871, inclusive, the four hundred and twenty-five dollars paid to him at the distribution, July 19, 1873, and the fifty-one dollars and thirteen cents paid to him May 1, 1876, at the final settlement, are all the cash moneys that were actually paid by the company to Mr. Drawbaugh, from the beginning to the end of its business, the rest being charged up against his dues for assessments and installments?

A. Yes, sir.

Q. 34. When the five parties who, with Mr. Drawbaugh, originally formed the Pump Company in the early part of 1867 purchased five-sixths of Mr. Drawbaugh's pump patent for the consideration of five thousand dollars, do you know whether they paid him that amount in cash, or did they pay him partly in cash and partly in notes?

A. I do not know how he was paid.

[*Examination of Mr. Gorgas suspended until* 4, P. M.]

Adjourned for dinner, until 2, P. M.

2, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Examination of Mr. Gorgas continued by Mr. Hill:

Q. 35. In my twenty-sixth question, I assumed that the company allowed Mr. Drawbaugh, on account of labor, &c., at the settlement of July 25, 1870, one thousand dollars less one hundred and fifteen dollars, as stated in the minutes. When the transaction was actually entered up on the account-books, was he credited with so large a sum as eight hundred and eighty-five dollars on that account, or not?

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A. The cash account in the ledger contains an entry under date of July 25, 1870, "wages paid Drawbaugh, $885.00," and the same cash account, on the same day, contains an entry of eight hundred and eighty-five dollars, received from him. The day-book of the date of July 25, 1870, contains no cash item relating to that transaction, but credits Drawbaugh eight hundred and seventy dollars "by labor and material to the amount of $1000 00 less $130 00, as upon the minutes." It, also, under the same date, contains an entry charging eight hundred and seventy dollars to the account "expense of labor." The account in the ledger, under Drawbaugh's name, contains no cash items relating to that transaction, but credits Drawbaugh with eight hundred and seventy dollars "by labor, etc." I am not able to explain the difference between these books. There seems to be an erasure in Drawbaugh's account in the day-book and in the ledger, in this same item. All the entries of this item are in Dr. Mosser's handwriting, and the erasures in this item are filled up in his handwriting. They all relate to the same transaction. This amount, whatever the sum was, was not actually paid to him in cash at the time, but was retained by the company against installments, as I have already testified substantially.

Cross-examined by Mr. Storrow :

Cross-Q. 36. As I understand the history of the enterprise to which these books relate, six persons, of whom Drawbaugh was one, bought of him his patent-right on pumps at the price of six thousand dollars, towards which the other five contributed five thousand dollars and he contributed one thousand dollars, so that he was to receive for his patent-right five thousand dollars and one-sixth interest; is that the case?

A. I was not a member of the original Drawbaugh Pump Company, but, as I understood, the form of the question covers the transaction.

Cross-Q. 37. That purchase, and the payment therefor, is not entered at all in the boooks which you have produced, is it?

A. No, sir; I consider it a matter apart from the organization of this Drawbaugh Pump Company.

Cross-Q. 38. I understand also that three persons had acquired from Drawbaugh the right to make measuring faucets under his patent, and that those three consolidated with the previous six into one concern, which was known as the Drawbaugh Manufacturing Company. Is that correct?

A. Yes, sir.

Cross-Q. 38½. These account-books, which you have produced, contain the accounts of the business carried on by the Pump Company, composed of the six persons, and the accounts of the business carried on by Drawbaugh Manufacturing Company, composed of the nine persons, but do not contain the accounts of the three who had the faucet patent-rights before consolidation. Is that so?

A. It is. I will add, that accounts of the Pump Company and the Drawbaugh Manufacturing Company are not separated, but are run right along in a continuous account.

Cross-Q. 39. Your father, William R. Gorgas, was one of the six and you were one of the three, were you not?

A. Yes, sir.

Cross-Q. 40. What part did you take in the business, or in the management of the affairs of these companies?

A. In the management of the affairs, I took the time of the men employed, and assisted my father in the keeping of the books. I also learned the trade.

Cross-Q. 41. The company did some work besides faucets and pumps, didn't it?

A. Yes, sir; we carried on a general manufacturing business.

Cross-Q. 42. Any machine shop jobbing business?

A. Yes, sir.

Cross-Q. 43. How many hands were employed at the shop from time to time?

A. The most we had employed at any time, as near as I can recollect, were eight.

Cross-Q. 44. Did any of the Drawbaugh family, besides Daniel, work there?

A. Yes, sir; his brother, J. B. Drawbaugh, and his nephew, Harman K. Drawbaugh, were employed while I was in the employ of the company.

Cross-Q. 45. Harman Drawbaugh worked there from the spring of 1868 to the spring of 1869 pretty much all the time, didn't he?

A. Yes, sir.

Cross-Q. 46. And John Drawbaugh worked there steadily through the same year, didn't he?

A. Yes, sir.

Cross-Q. 47. They both of them worked there some in 1870, didn't they?

A. Yes, sir.

Cross-Q. 48. Did a man by the name of E. B. Hoffman work there some time in 1868? If so, how long? Please look at the books.

A. I know that he did. The first payment of wages to E. Hoffman is under date of April 4, 1868, "as wages on account of March." The next payment to him is under date of May 6, 1868, about a full month's wages, undoubtedly on account of April, and those are the only payments to him.

Cross-Q. 49. Who were the six first members?

A. William R. Gorgas, Henry S. Rupp, Samuel M. Hertzler, John M. Hursh, John Sheeley, and Daniel Drawbaugh.

Cross-Q. 50. Who were the three?

A. A. H. Gardner, Joseph Hursh, and myself.

Cross-Q. 51. I notice in the day-book there seem to be entries of a good many faucets returned to the company. Was that one of the causes that led to the absence of dividends?

A. It was.

Cross-Q. 52. I notice at the end of the second day-book, under date of July 20, 1876, the small distribution of cash by the company, in which Drawbaugh received twenty dollars. I suppose that was paid as stated in the book, was it not?

A. Yes, sir; it was the final distribution of money in the hands of the treasurer.

Cross-Q. 53. I observe in the day-book in 1868, that the company did some drafting for the Mill Bush Company, and that they had Daniel Drawbaugh do it, and charged five dollars a day for his time. Did he have sufficient skill to work as a mechanical draftsman?

A. Yes, sir.

Cross-Q. 54. I see a good many charges for getting up patterns for the Mill Bush Company. Were you getting up a set of patterns and machinery for them?

A. Yes, sir.

Cross-Q. 55. In your ledger I notice, on page ninety, quite a long account, headed "Trams." Did your company make and sell Drawbaugh's patent tram?

A. Yes, sir.

Cross-Q. 56. Will you please look at that account and tell me whether you ever sold any trams to the firm of Zacharias & Son, and if so, give me the date of all your sales to them?

A. I find on March 17, 1869, Zacharias & Son were charged with one tram, twenty dollars.

Cross-Q. 57. When was that tram paid for?

A. There appears a credit on April 16, 1869, of Zacharias & Son for tram, on account, twenty dollars.

Cross-Q. 58. Do you find any other tram sold to them or charged to them or paid for by them?

A. No, sir.

Cross-Q. 59. Why was Drawbaugh asked to give up or deduct the one hundred and fifteen dollars in 1870?

A. I was not present at the meeting of the company, at the time of that settlement, but there was a feeling among the members of the company that Drawbaugh had been well paid for his patent-right, and they were disposed to make the best possible terms of settlement with him.

Cross-Q. 60. What was the price paid him for the faucet right which the three owned?

A. I do not know. I procured my interest from Mr. Gardner.

Cross-Q. 61. Do you mean that you bought part of Mr. Gardner's interest?

A. Yes, sir.

Cross-Q. 62. Mr. Gardner did some active work for the Drawbaugh Manufacturing Company, didn't he?

A. The books show, under date of July 25, 1870, "expenses to A. H. Gardner, for hauling &c. for company as per bill, $76 96."

Re-direct by Mr. Hill:

Q. Q. 63. Do you know whether Mr. Hursh bought his interest in the faucet from Mr. Gardner, or not?

A. I am not positive, but I think he did.

Q. Q. 64. What was the trouble or defect that caused faucets to be returned?

A. Some were imperfectly made, some became rusty inside and would not work easily, but the principal cause was that they were imperfect in construction.

Q. Q. 65. They were measuring faucets, were they not?

A. Yes, sir.

Q. Q. 66. Were they good faucets when properly constructed?

A. Yes, sir.

Q. Q. 67. Did Drawbaugh turn in his mill-tram and staff invention for the benefit of the company?

A. Yes, sir.

Re-cross by Mr. Storrow:

Re-cross-Q. 68. By your last answer, I suppose you mean that he allowed that company to make and sell those articles while they were doing business, and not that he actually assigned those patents to them forever as their own property, don't you?

A. There is a minute about that that will explain the thing—I find that I was mistaken in my answer to the sixty-seventh question. The minute of August 28, 1868, reads as follows:

"It was proposed to manufacture trams. D. Drawbaugh agreed to take two dollars per tram for his share of patent right, and William R. Gorgas to see Mr. C. Eberly, to ascertain whether he agreed to take the same. On motion of William R. Gorgas and S. M. Hertzler, it was agreed to make stave-jointers."

Re-cross-Q. 69. Please to hand to the examiner, to be made part of the record, one of the printed bill-heads of the company.

A. Here it is.

Drawbaugh Manuf'g Comp'y,
Box 46, Shiremanstown, Pa.,
MANUFACTURERS OF
Drawbaugh's Rotary
POWER PUMP,
for Mining and Factory use, etc
Drawbaugh's Self-Measuring Faucet,
For Drawing and Measuring MOLASSES, HONEY, TAR AND ALL OTHER VISCID LIQUIDS.
Also Stave Cutters, Stave Jointers, Mill Trams, Hydraulic Rams, &c. All kinds of Job Work and Building of Special Machinery solicited and attended to promptly.
Circulars and Price Lists Mailed on application.

All Claims for Deficiencies must be reported by mail or otherwise within Ten Days after receipt of Goods, otherwise none will be allowed.

Manufactory and Warerooms, Eberly's Mills, Cumb. Co. Pa.,

Near Harrisburg, ... **187**

M ....

Bought of **Drawbaugh Manufacturing Company,**

TERMS, ...

All orders should be addressed to
M. B. MOSSER, Sec'y and Treas.
Box No. 46, Shiremanstown, Pa.

VALLEY DEMOCRAT PRINT.

Re-re-direct by Mr. Hill:

Q. Q. Q. 70. When do the minutes show that you, Mr. Gardner, and Mr. Hursh united with the other six members in the business?

A. The minutes of October 7th, 1867.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 22d day of July, 1881.

FRED. M. OTT,
Examiner.

WM. L. GORGAS.

E. B. HOFFMAN *recalled.*

Examined by Mr. Hill:

Q. 1. In your deposition given June 1st, 1881, you stated that in the latter part of the summer of 1873 you were fishing on Yellowbreeches creek, and while there were at Mr. Drawbaugh's shop, and saw the machine marked "I," and that before that time you had seen the machine marked "C," but that when you saw the latter machine it contained a large horse-shoe magnet that extended out about two inches beyond the base-board, &c. Will you now look at the machine on the table before you, marked "C reproduced," and state how it compares with the machine "C," as you saw the latter prior to the fishing excursion of 1873?

A. That is as near the machine as I can tell—looks as near like the one that I saw there.

Q. 2. Do you recollect whether or not, when you saw that machine prior to the said fishing excursion, it contained an electro-magnet arranged in the same position as this one on "C reproduced?"

A. It had. I think the coils were a little larger, though.

Q. 3. When Mr. Drawbaugh first showed you the machine referred to, was the horse-shoe magnet in the position in which it now is on "C reproduced," or not?

A. It was not. It was laying on the bench, and he placed it in position—something like that position there. [Pointing to horse-shoe magnet on "C reproduced."]

[*Examiner certifies that the position of the magnet referred to is nearly horizontal, with the poles in contact with the cores of the electro-magnet.*]

Q. 4. How does the horse-shoe magnet on "C reproduced" compare with the horse-shoe magnet that Mr. Drawbaugh placed on the machine you refer to?

A. It is about the same in size, only there was another piece of steel to it—four pieces instead of three.

Cross-examined by Mr. Storrow:

Cross-Q. 5. Did you ever go to Drawbaugh's shop after the fishing excursion you have spoken of?

A. I was there several seasons, 1873, 1874—1877 was the last time I was over, I think.

Examination taken, reduced to writing, and by the witness subscribed to before me, this 22d day of July, 1881, he having been affirmed upon his previous examination.

FRED. M. OTT,
Examiner.

E. B. HOFFMAN.

Adjourned until Monday, July 25th, at 10, A. M.

Monday, July 25th, 10, A. M.

Examination resumed pursuant to adjournment.

Present, Mr. Storrow for complainants, and Mr. Hill and Mr. Jacobs for respondents.

AMOS FROWNFELDTER, *being produced, sworn, and examined, saith:*

Examined by Mr. Hill:

I am forty-six years old; I live in Fairview township, York county; I am farming now.

Q. 1. Do you know when the old saw-mill that used to stand close by Daniel Drawbaugh's shop, at Milltown, Cumberland co., Pa., was torn down and hauled away?

A. In 1874, about the first of September, as near as I can recollect.

Q. 2. Who hauled the stuff away when the mill was torn down?

A. I hauled it away myself.

Q. 3. Was that old mill in a dilapidated condition for some time before it was torn down?

A. Yes, sir; the foundation was in great part washed away.

Cross-examination waived by Mr. Storrow.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 25th day of July, 1881.

FRED. M. OTT,
Examiner.

his
AMOS ⋈ FROWNFELDTER.
mark.

MICHAEL M. GROVE, *being produced, sworn, and examined, saith:*

Examined by Mr. Hill:

I am fifty-two years old; reside in Harrisburg, Pa.; I am superintendent of the Harrisburg stock-yards. I know Daniel Drawbaugh, of Eberly's Mills, Cumberland co., Pa., and have known him since I went into partnership with Bear, Kline & Moore.

Q. 1. Have you any recollection of seeing Mr. Drawbaugh's talking-machines, and hearing him speak of them, about the time you were becoming connected, or during the time you were connected, with the Axle Company?

A. Yes, sir; he showed me an arrangement—I don't know what you might call it—a box arrangement, that he had there. He said, if he would talk into it, you could hear him at Pittsburgh. He went on to explain it to me. I didn't take much stock in it, nor pay much attention to it. The remark that you could hear it to Pittsburgh is about the only thing that I recollect of.

Q. 2. I suppose your interest was mainly on the Axle Company's business, was it?

A. Yes, sir.

Q. 3. About what time was it that he showed you that instrument, and had that conversation about it?

A. It was shortly after we went into business together. I think it was the first time I went over there after we had signed the articles of agreement here.

Q. 4. Do you mean the articles of agreement of co-partnership, dated December 23d, 1874?

A. Yes, sir.

Q. 5. Please look at machines "A" and "D," now shown you, and state whether you have any recollection of having seen them at Mr. Drawbaugh's shop about the time you have referred to.

[*Objected to as leading.*]

[*Question withdrawn and the following substituted.*]

Q. 6. Please look at the instruments "A" and "D," now shown you, and state whether you have any recollection of them, and if so, when and where you first saw them.

A. They look to me as if they are the ones that Drawbaugh showed to me at the time he made the remark, above referred to, that he could be heard to Pittsburgh.

Q. 7. It has appeared in evidence here that the axle firm was dissolved about the last of February, 1876. That Mr. Bear and Mr. Kline went out of the concern at that time, and that you and Mr. Moore went along with the business for a while, Mr. Bear chiefly attending to it, having some little repairing work done on reapers and mowers in the summer of 1876, and that in November, 1876, all the property was turned over to Captain Moore, who assumed the debts. Does your recollection agree with this, or not?

A. Yes, sir.

Q. 8. After Mr. Bear and Mr. Kline went out, about the last of February, 1876, did you pay much further attention to the business, or not?

A. No, sir.

Q. 9. Who did chiefly manage the business after that time?

A. Captain Moore.

Q. 10. After Mr. Kline and Mr. Bear went out, did you go over to the shop again, or not, so far as you remember?

A. I haven't any recollection of going over after that.

Q. 11. Where did you reside while that business was going on?

A. When I first went into it, I was keeping the hotel at the stock-yards in Dauphin county, just above Harrisburg. Then I moved from there down to Harrisburg.

Q. 12. Have you, or not, any recollection of a man named Samuel C. Crawford being in the employ of Mr. Bear and Mr. Kline before you went in with them in December, 1874?

A. Yes, sir.

Q. 13. Was it in cold or warm weather when Mr. Drawbaugh first showed you his talking-machines?

A. It was in cold weather.

Q. 14. Was it during the first winter that you were connected with the axle business?

A. Yes, sir.

Cross-examined by Mr. Storrow:

Cross-Q. 15. Please tell me anything else you remember about Drawbaugh's talking-machines.

A. I don't remember anything at all about it, except that one remark he made, as I have said.

Cross-Q. 16. Didn't you ever see any talking-machines there, except once?

A. I don't remember.

Cross-Q. 17. Do you feel quite sure that you have never been at Drawbaugh's shop since February, 1876?

A. I don't recollect the dates when I was there.

Cross-Q. 18. How long have you known Drawbaugh?

A. I got acquainted with him about the time, or shortly before, I bought an interest in Kline's patent axle.

Cross-Q. 19. Did you keep the White Hall Hotel here at one time?

A. Yes, sir.

Cross-Q. 20. When?

A. I moved there the first day of April—I don't remember the exact year. I think it was in 1875.

Cross-Q. 21. How long did you keep that hotel?

A. Two years.

Cross-Q. 22. Cumberland county people generally went to that hotel, didn't they?

A. Yes, sir; most of them stopped there.

Cross-Q. 23. Where did you go to after you stopped keeping that hotel?

A. I moved to Fifth street, Harrisburg.

Cross-Q. 24. What was the last place you lived at before you began to keep the White Hall Hotel?

A. I lived in Fenn's house, Walnut street, Harrisburg.

Cross-Q. 25. How long did you live in Fenn's house?

A. I moved there in May, and left there in April.

Cross-Q. 26. Where did you last live before you moved there?

A. I moved from the stock-yards to Walnut street.

EPHONE COMPANY,-1

Re-direct by Mr. Hill:

Q. Q. 27. It must have been in April, 1876, then, that you began to keep the White Hall Hotel?

A. I couldn't tell without looking at my books. I don't know how long I lived in Fifth street. I can't remember the dates. I didn't keep any account of the dates in my mind.

Re-cross by Mr. Storrow:

Re-cross-Q. 28. Do you live in Fifth street now?

A. Yes, sir.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 25th day of July, 1881.

FRED. M. OTT,
Examiner.

M. M. GROVE.

GEORGE L. HALE, *being recalled, and affirmed, saith:*

Examined by Mr. Hill:

Q. 1. In your former deposition in this case, you testified that in the fall of 1873, Daniel Drawbaugh, at his shop at Milltown, showed you the machine "C," but that the machine was not in the same condition as now. Please look at the machine marked "C reproduced," and state how that compares with the machine that Mr. Drawbaugh showed you in the fall of 1873.

A. That is like it. He had a magnet on, like that horse-shoe magnet on "C reproduced," as near as I can tell. I don't know whether it was exactly the length and width of that; it was on a platform. The magnet was about six inches long and about three inches wide, as near as I could tell.

Q. 2. Please look at the two spools wound with wire, that lie between the poles of the horse-shoe magnet and the armature attached to the diaphragm, and state whether the machine did or did not have such spools on it at the time that you saw it in the fall of 1873.

A. It had something of that kind on, but it was copper wire, covered with green, and the wire, I think, was heavier than that, too.

Q. 3. Was it arranged between the poles of the horse-shoe magnet and the diaphragm?

A. Yes, sir; but how it was fastened there I couldn't remember.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 25th day of July, 1881.

FRED. M. OTT,
Examiner.

GEO. L. HALE.

Recess for dinner until 2, P. M.

PHONE COMPANY,-1

AMERICAN BELL TELEPH

LEPHONE COMPANY,-2

United States Circuit Court.

SOUTHERN DISTRICT OF NEW YORK.

AMERICAN BELL TELEPHONE COMPANY,

AND OTHERS,

VS.

PEOPLE'S TELEPHONE COMPANY,

AND OTHERS.

Defendants' Testimony in Answer to Complainants' Case.

REPRINT.

VOL. II.

HARRISBURG:
EDWIN K. MEYERS, PRINTER,
1886.

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July 25th, 1881, 3.30, P. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

[*By consent of counsel for complainants and respondents, further taking of respondents' testimony is adjourned, to be resumed hereafter upon one week's notice to complainants' counsel, formal notice being waived. It is also agreed by counsel that respondents' time for closing testimony be extended to the* 15*th day of October*, 1881.]

November 14*th*, 1881.

Examination resumed by agreement of counsel.

Present, Mr. Storrow for complainants, and Mr. Hill and Mr. Jacobs for respondents.

HENRY HERR, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

My age is fifty-three; residence, Harrisburg, Dauphin county, Pennsylvania; occupation, farming. I know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Penna., and have known him since about the year 1869.

Q. 1. How happened you to become acquainted with him in the year 1869?

A. I was inquiring for a man who understood putting in a ram, which I desired for raising water to my barn-yard, and I was directed to him as a proper person for that purpose.

Q. 2. While you were talking with him about the ram, did he ever say anything to you about a talking-machine?

A. He drawed my attention to a machine there that he called a talking-machine, but I can't say that it was at the first time that I was there. I was there often, and at one of those times he called my attention to it—at different times.

Q. 3. Were you ever there after Wilson Bear and Jacob Kline commenced to manufacture axles at Drawbaugh's shop?

A. Not that I can recollect. I never met them there that I can recollect. He was always alone when I saw him.

Q. 4. Were you ever there after the Haucks bought out the faucet business and commenced to make faucets there at Drawbaugh's shop?

A. I don't recollect anything of the Haucks being there. I know

Mr. Hauck, of Mechanicsburg, but I never saw him there, to the best of my recollection

Q. 5. How soon after you first began to talk to Mr. Drawbaugh in 1869 about the ram was it that he began to talk to you about, and show you, the talking-machine?

A. That I can't tell, how soon after the first time. We were speaking about an injector that he said he had invented, but that some parties had got ahead of him, and that now he had invented something that would take the place of the telegraph, or would be used for the telegraph; that is the way the conversation started.

Q. 6. How long was it after the first time that you were there?

A. It was during that year, to the best of my recollection. I have no record of any kind.

Q. 7. How did the talking-machine that he showed you look?

A. It was quite a small affair, and there was a wire or cord that ran out of the building, and then there was a wire that ran down. He took me down into the cellar and showed me where the wire ran into the ground, but how it was fixed or fastened I do not know.

Q. 8. Did he talk into the machine in your presence or hearing?

A. I think he did, but I urged him to stop that and go to my work, as I was not interested in anything of that kind. I was anxious to get home.

Q. 9. Do you recollect of listening at the machine to see whether you could hear what was said through it?

A. I think he spoke through the machine. I don't recollect that I did. He walked up to it and talked into it to let me see how it was done. I don't recollect that I listened to it; I was anxious to get away.

Q. 10. How often did he speak to you about that invention?

A. To the best of my recollection, he drawed my attention to it every time I came there after the first time he showed it to me. His object was to secure his invention by getting a caveat, or some such thing he called it, and he wanted money to get it. He was a stranger to me.

Q. 11. What did he say about his money matters, and about his wanting to get money to protect his invention?

A. He said he was a poor man and he couldn't raise the means, and if I would help him, or procure any person to assist him, he would give me a half interest.

Q. 12. What sort of a looking instrument was it that he talked into?

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A. It was a kind of a round block—greasy from working at it with greasy hands—and it was partly tin, and, I think, partly glass.

Q. 13. Please look at the instruments "B" and "F," which I now show you, and state whether it bore any resemblance to these instruments, or whether it was different.

A. This here "B," or something very much like this, was among the lot. He only had it very temporary—just got up. I can't say whether "F" was there or not. There was a glass part there, but I can't say whether it was this or not.

Q. 14. Do you recollect whether the wires that you saw down in the cellar were drawn tight, or were they loose and hanging slack?

A. To the best of my recollection, they were slack; they were not tight.

Q. 15. Were there any wires attached to the instrument and running out of the building?

A. There was one, and I thought it ran up to a house, but I didn't see where it ran to, except that it ran out of the building.

Q. 16. Have you any recollection of seeing this instrument "C" there?

A. Towards the latter part of my calls there I saw something like this. Perhaps a couple of years after, when he had what he called improvements. Then he had something like this, and he had a kind of a steel with it, the shape of a V, I think—or horse-shoe.

Q. 17. Please look at this instrument "C reproduced," and tell us how this compares with the instrument you have referred to.

A. It was something like this, only it looked older, as if it had been used more than this. He had it standing on a table with his other fixtures. I don't know that he used it while I was there; he had other speaking-machine fixtures.

Q. 18. Who was running the Eberly's mills the last time you were out there and saw the speaking-machines?

A. The man's name was Methusalem or some such name—from Carlisle. He had it after Eberly. The name Beetem is suggested to me now, and, I think, that is the name.

Q. 19. What were you out there for at these different visits?

A. I was there after repairs to my ram.

Q. 20. What did he call the machine that he showed you?

A. A talking-machine or speaking-machine, to the best of my recollection. It was to take the place of the telegraph.

Cross-examined by Mr. Storrow:

Cross-Q. 21. Who directed you to go to Drawbaugh about a ram?

A. Some of his neighbors had told me about his putting up rams. I think it was Harry Neidig, a cousin of mine. I think he had put one in for him.

Cross-Q. 22. Did you go and look at one before you bought?

A. Not that I can recollect. I went to see him to come over and see whether I had a sufficient supply of water to run a ram before ever I contracted for one, or fall enough for the purpose.

Cross-Q. 23. Did he come over and look at your place?

A. He came over on a Saturday morning, and this neighbor of his, who was mentioned a bit ago, brought him over.

Cross Q. 24. Did you contract with him to put up a ram for you?

A. Yes, sir.

Cross-Q. 25. What price did you pay him?

A. It was between sixty-five and sixty-eight dollars, as near as I can recollect. He furnished the pipe and the ram, and connected them all complete in running order.

Cross-Q. 26. Did he have the ram all made when you went to his shop, or did he make it for you?

A. I think he made it for me. He had none finished when I went there.

Cross-Q. 27. How long did you keep it?

A. I think I had it till 1874 or 1875, as near as I can recollect.

Cross-Q. 28. You speak of going to his shop to get it repaired. Did it get out of order often?

A. I had a good deal of trouble with the air-chamber, as he called it. Not understanding it myself, it gave me a good bit of trouble to get it to work right.

Cross-Q. 29. How many times do you think you went to his shop about it?

A. I was back and forward pretty often the first few years, I couldn't give the number of times. I think I had a new drive pipe, and then he killed time, as I thought, with this talking-machine. When anything would come into his mind about it, he would let everything go and leave my work. He would drop my work while I was there, and he disappointed me several times that I had to go back again. He said he worked day and night at this other machine.

Cross-Q. 30. Do you mean to say that he gave you as an excuse

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for not finishing your work that he worked day and night at his talking-machine?

A. That is what I understood him to say; that he worked day and night, and whenever he had nothing on hand that was too urgent upon him; and I know that he dropped my work to work upon it.

Cross-Q. 31. Did he ever tell you that more than once?

A. I think he did.

Cross-Q. 32. Did you pay him for this work of yours that you think he dropped?

A. I always paid him as soon as he had the job that he was working at finished. I paid him for the ram as soon as he had it connected and the water ran up; and so I paid him for the other jobs, too, as soon as he had them finished.

Cross-Q. 33. How much money did you lay out repairing that ram?

A. I think I got a new ram once. I think he took the ram back and gave me a new one; and then I had threads cut and other things done. I think I have the account yet of putting the ram in; but the other things I just paid him as he had them done.

Cross-Q. 34. What made you take it out finally?

A. A man by the name of Tunis, a plumber in town here, said he had an improved ram, and if there was anything wrong with it, I would not have so far to go to have it repaired and looked after.

Cross-Q. 35. Who did you ever see at work in Drawbaugh's shop when you went there?

A. He was generally at work by himself; he had a helper sometimes. There might have been at work in a different part of the shop, that I did not see. I used to sometimes come when he was not there himself. I used to get my feed at the mill there and stop at the shop.

Cross-Q. 36. What part of the shop did you see him in?

A. What he called the upper shop. I think there was a shop in the lower part, but the upper part is where I generally found him, and where he had his tools and machines

Cross-Q. 37. How did you get into the upper part of the shop—where were the stairs?

A. I think it went in even to the lower shop and that you went up-stairs to the upper shop. I have not been there for several years.

Cross-Q. 38. By going in even, do you mean going in without any steps at all—only a threshold?

A. I don't recollect, but it appears to me there was a step or so down to the lower shop. We went down-stairs on the inside when he showed me the wire running into the ground. There might have been steps on the outside running up to the upper shop, and a step or so down into the lower shop from the outside.

Cross-Q. 39. Then, do I understand you to mean that what you call the lower shop was on the level of the ground outside, or perhaps a step below it?

A. I think that is as near as I can recollect it. It was very seldom I got into the lower part. It is four or five years ago, I think, since I have been there.

Cross-Q. 40. And what you call the upper shop was the floor above this lower shop, with a flight of stairs leading up to it from the lower shop, and, perhaps, some steps besides, outside, leading to it. Is that what you mean?

A. If I can recollect the place right, there was steps outside to the floor that he was working on. I can't say how many steps.

Cross-Q. 41. Was the floor that he was working on the one right over what you call the lower shop?

A. That I can't recollect—about the lower shop. I only recollect once being down in the lower shop, or room, or store-room, or whatever you call it.

Cross-Q. 42. How many flights of stairs did you go up to get to the shop where you commonly found him working?

A. That I can't recollect.

Re-direct by Mr. Hill:

Q. Q. 43. What business was Mr. Drawbaugh working at when you used to go there?

A. I think he called them faucets. Something for measuring molasses, to the best of my recollection—a measuring faucet; and then he did repairing for the neighbors and farmers on reaping-machines, threshing-machines, &c. It appears to me I saw those things there.

Q. Q. 44. Have you ever been there since the beginning of the "Centennial" at Philadelphia?

A. I don't think I have; I don't recollect that I was.

Q. Q. 45. Do you recollect who was concerned with Daniel Drawbaugh in the faucet business, when you used to go there?

A. I do not recollect whether he had a partner or not. I did not notice any one there, and I did not hear that there was any one. It

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appears to me that when he gave me a receipt for my ram he gave me one in his own name.

Q. Q. 46. How long had your cousin had his ram before he told you about it, and you got yours?

A. I can't say positive that he had his ram before I got mine; but he told me first about the rams that were being put up through the neighborhood by Mr. Drawbaugh, and then I concluded that I would go to see him.

Q. Q. 47. Have you held any public office here in the county or city during the past few years?

A. I have been Director of the Poor of Dauphin county for three years.

Q. Q. 48. What years?

A. Along 1871, 1872, and 1873, I think.

Q. Q. 49. Was your information about Mr. Drawbaugh's talking-machine obtained before or after you first became Director of the Poor?

A. To the best of my recollection, it was before—shortly before—a year or so before.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 14th day of November, 1881.

FRED. M. OTT,
Examiner.

HENRY HERR.

Adjourned until the 15th of November, at 10, A. M.

November 15, 1881, 10 *o'clock*, A. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

JOHN WOLF, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

I am seventy-five years of age; reside at Camp Hill, Cumberland county; I used to farm, but do nothing now; I am getting too old to farm now. I know Daniel Drawbaugh, of Eberly's Mills, and have known him upwards of thirty-five years; I have lived about forty-five years in that neighborhood.

Q. 1. Did you do any work for the firm of M. M. Grove & Co., consisting of Grove, Kline, Moore, and Bear, about the time when they commenced operations in the business of manufacturing axles, &c., in Drawbaugh's shop at Milltown? If so, what work did you do for them?

A. I was hauling the lathes, and the first I hauled was a load of coal. I did all the hauling that they needed at that time. I have it here in black and white.

Q. 2. Did you make a book entry or written memorandum at that time showing the work you did for them, and the dates at which it was done?

A. Yes, sir.

Q. 3. If you have it here, will you hand it to the examiner, and point out to him the entries relating to that work, in order that he may make a copy of them upon the record of this case?

A. Yes, sir; here they are.

On February	20, 1875, one load of coal,	$ .50
March	8, three lathes from Harrisburg,	4.00
do	26, box of axles and coal, Milltown,	1.25
do	27, one grindstone to Milltown,	1.00
do	28, one load of boards and plank,	1.50
do	31, one drill lathe,	1.25
April	13, to one load of brick from Harrisburg,	1.25
do	14, to one load of axles from Bridge to Milltown,	1.00
do	16, to one load of coal to Milltown,	.75
June	10, one load of axles to Milltown,	1.00
Feb.	25, to one load of axles to Milltown,	1.00

The above items were hauled on the order of Wilson Bear.

The following were hauled on the order of Captain Moore, to the same shop:

1875,	to box of axles to Milltown,	$2.50
13,		
Sept.,	barrel of oil to Milltown,	1.00

Q. 4. At the time when you hauled these first items in February and March, 1875, were they just getting their new machinery into the shop for the purpose of manufacturing axles there?

A. Yes, sir.

Q. 5. While you were hauling that new machinery in, in February and March, 1875, did you see anything of Daniel Drawbaugh about the shop?

A. Yes, sir.

Q. 6. Did you have any conversation with him during the months of February and March?

A. Yes, sir.

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Q. 7. In those conversations, was anything said about a talking-machine?

A. It was either the first or second load I brought there, I am not certain which, that I had to go into his room or shop where he has his instruments to work, to find him. He showed me a thing there. Says he: "I am working at a talking-machine here, and if I can get it accomplished, or had the means to get it accomplished, I would be a rich man."

Q. 8. Give his language, as near as you can, just as he said it.

A. He told me "if he could get this accomplished—get it patented—he would be one of the richest men." I think that is as near as I can explain it.

Q. 9. What did he say about means?

A. He said that he was a poor man; that he had not the means; that he had so much sickness in his family, that keeps him poor.

Q. 10. Did he show you the talking-machines, or any of them?

A. Yes, sir; he showed me some. I guess he would have showed me more, but I was in a hurry with the hauling. He was employed to help me in unloading, and I urged him on the best way I could.

Q. 11. What was he doing when you had to urge him on to help you?

A. Most of the time he was in his room at his talking-machine, working. Sometimes he was in the shop where the lathes were to be put in, ridding out that.

Q. 12. Did he talk to you through the machine?

A. No, sir.

Q. 13. Have you ever been in the shop since you finished your hauling there?

A. I was in once.

Q. 14. When was that?

A. I think it is this winter two years that I sold him a lot of potatoes, ten or twelve bushels, that I went down to him. He was in the shop then.

Q. 15. Did you have any talk with him about the talking-machine at that time?

A. No, sir.

Q. 16. At the time that you hauled the lathes, &c., to his shop, in 1875, did you talk with him about the talking-machines on more than one trip?

A. I talked several times with him about it.

Q. 17. Do you remember on which trips it was that you talked with him about it?

A. It was either on the first or second that we had the first conversation about it.

Q. 18. Can you fix the trips on which you had other conversations about it?

A. Yes, sir; what makes me certain is the time when I hauled the grindstone there.

Q. 19. What talk was there at the time when you hauled the grindstone there?

A. We had to get a new rope and put up pulleys, to hoist the grindstone, and while we were at work he went off—Daniel did. He went into his room, then, again, and after we were through, and ready to hoist, I went in and fetched him out. He came right out and helped to hoist, and there was nothing talked about his machine at that time. He was working at a wheel. I was in a hurry to get home. I think it was drizzling with rain.

Q. 20. When you went in to bring him out, did you see any of his talking-machines there, in his room, or not?

A. I did.

Q. 21. Please look at these machines, "B" and "F," which I now show you, and state whether you have, or have, not any recollection of seeing either of them there at his shop, at the time you were engaged in hauling the lathes and grindstone?

A. I don't mind of seeing that, "F," but it runs in my mind that I saw that, "B," lying on the bench.

Q. 22. Did you see anything there that looked like either of these two machines, "C" and "C reproduced," which I now show you?

A. Yes, sir, I saw this one ["C."] I picked it up and took it in my hand. Something pretty much like this [horse-shoe magnet of "C reproduced"] was lying on the bench.

Q. 23. Look at this machine "A," which I now show you, and state whether you saw that there, or anything like it, at that time when you were hauling the lathes or grindstone.

A. Yes, sir; I saw such a wheel, pretty much like this ["A"] at that time.

Q. 24. Answer the same question as to these two machines, "D" and "E."

A. I can't recollect of seeing these; they might have been there, but I don't recollect of seeing them. There was always so much lying on his bench that it was crowded all the time with one fixture and another.

Q. 25. Did you particularly examine or take much interest in his talking-machinery?

A. No, sir.

Q. 26. Did he tell you at that time whether he could talk through his machines, and if so, how far he could talk through them?

[*Objected to by Mr. Storrow as hearsay and incompetent.*]

A. Not as I can mind of.

Q. 27. Did he say anything about the telegraph in connection with the machine?

A. He told me at one time, but I don't recollect whether it was at the time of the hauling, or at a time when I was in, since the hauling—he told me that if he had it in operation right, once, he could talk across the ocean.

Q. 28. I understood you to say that you had no conversation with him about the talking-machine at the time when you were in there since the hauling. Do you now think that you may have had conversation with him about the talking-machine at that time?

A. I think it must have been at the time of the hauling.

[*Question objected to by Mr. Storrow as leading.*]

Cross-examined by Mr. Storrow:

Cross-Q. 29. How far from Mr. Drawbaugh do you live?

A. About two miles.

Cross-Q. 30. When you were at the shop, was he generally at work on his talking-machines?

A. The most of the time.

Cross-Q. 31. And do you mean that when he ought to have been helping you to unload, he would leave you and go off and work on his talking-machine?

A. Sometimes he would work on the talking-machine, and at other times he would work on the floor where we put the lathes down.

Cross-Q. 32. In the account, in your third answer, I see an item of February 25th, with no date of the year to it. What year was that?

A. I think that was in 1875.

Cross-Q. 33. How did you happen to get that entered separately from all the rest?

A. These were hauled up to the store at Camp Hill, and Kline ordered me to take them back. They were ordered wrong.

Cross-Q. 34. Whose store?

A. Kline kept it that time.

Cross-Q. 35. What else did you ever see in Drawbaugh's shop, besides talking-machines?

A. I saw some clocks standing there—these eight-day clocks—that people brought there to repair, still.

Cross-Q. 36. What else did you see?

A. He repaired reapers. He fixed them so they would not rattle so—took the motion off. He fixed one for my son, and several others that I know of.

Cross-Q. 37. What else did you ever see at his shop?

A. That is about all that I can recollect, except the faucet business, that he was engaged in. I never saw him working at them, but I saw them lying there—a whole host of them—when I brought the drills there.

Re-direct by Mr. Hill:

Q. *Q.* 38. When did you see the harvesters there for repairs?

A. I did not see them there, but my son told me that he had his there, and so did Hohler.

Examination taken, reduced to
writing, and by the witness affirmed
and subscribed to before me,
this 15th day of November, 1881.
FRED. M. OTT,
Examiner.

JOHN WOLF.

JOSEPH C. JEFFERIES, *being produced, sworn, and examined, saith:*

Examined by Mr. Hill:

My age is forty-four; residence, Steelton, Dauphin county, Pennsylvnnia; occupation, carpenter. I know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pennsylvania, and have known him since the fall of 1876.

Q. 1. Under what circumstances did you become acquainted with him in the fall of 1876?

A. I met him at the election polls of Lower Allen township, Cumberland county. It was the general election of 1876, on the first Tuesday after the first Monday of November.

Q. 2. Did you have any conversation with him about talking-machines on that day?

A. There was a large party of us there together, and he was explaining about manufacturing a machine to talk with. His conversation was not directed to any one of us directly, but it was to the party, and he invited us all to visit his shop and have a look at it.

Q. 3. How do you fix the year as 1876?

A. That year I moved from Harrisburg to Lisburn, Lower Allen township. In the month of August, I attended a sale there and bought a property from William H. Gilmore. I then moved there in September.

Q. 4. Did you vote there at that election?

A. No, sir; I did not, but I went with a party to the polls. It is customary there for one of the men residing at Lisburn to hitch up a four-horse wagon, and haul all the voters from Lisburn to the polls. I think Mr. Barber hauled us that day.

Q. 5. Did you accept Mr. Drawbaugh's invitation to visit his shop and see his talking-machine?

A. Not on that day; but, as near as I can remember, it was on the following week that I paid the first visit to his shop. I was working at Harrisburg, for Theodore F. Boyer, at the Temperance hotel, repairing different places around the house, and on my way home I stopped into Mr. Drawbaugh's shop, and that is the first visit I ever paid there. I then saw some of the apparatus that he was working on.

Q. 6. State, as near as you can recollect, the conversation that took place there in the shop with him during that first visit.

A. I went in and passed up the stairs to his shop, and said: "Mr. Drawbaugh, as I was along your way, I thought I would stop in and see this great instrument you were speaking of, of talking." Said he: "I will show it to you in a few moments." He then went to one corner of the shop and showed me some of the things he had set up, and he described to me a wire he had running through the shop floor, and the connection he had below in the ground.

Q. 7. Did he talk to you through the machine?

A. Not to me. He went to the machine, and handled it, and spoke, and just gave me a general idea of the working of it.

Q. 8. Did he tell you how far he could talk through it, so as to be heard and understood?

[*Question objected to by Mr. Storrow as hearsay and incompetent.*]

A. He told me that he could talk most any distance, but his great object was to intensify, or get more power of tone.

Q. 9. Did he say anything about patenting it?

A. He said if he could get any one who would take a hold of it and go in with him, with capital, that he would get it patented; but that he was too poor to do it himself.

Q. 10. Did he say anything about the use of batteries, or anything of that kind, in connection with it?

A. When he gave me the explanation of the ground wire, he told me that it was connected with a battery, or magnet, or electricity from the earth, or something of that kind.

Adjourned until 2, P. M., for dinner.

Examination resumed, pursuant to adjournment at 2, o'clock, P. M.

Q. 11. How long did you remain examining the machines, and talking to Mr. Drawbaugh, during that visit?

A. I probably was there from an hour to an hour and a half.

Q. 12. How soon were you again at his shop afterwards?

A. As near as I can remember, from two to three weeks intervened. I know it was shortly after.

Q. 13. Do you think it was during the same month, November, or not?

A. No, sir; I think not. I think November had passed before my second visit.

Q. 14. Was it before Christmas, or after?

A. It was before; because just before Christmas I had got through at Mr. Boyer's for the time being.

Q. 15. How long were you there at that second visit?

A. I can't possibly give the length of my visit; but it was not long—merely a short visit; just stopping on my road.

Q. 16. Did you see any talking-machines, or have any talk with him about them, at the time of that second visit?

A. I saw the different parts of his apparatus on a bench, and I asked him how he was getting along with it, as I most always asked him when I went there. He said he was still in the same old position.

Q. 17. When were you there last?

A. My last visit was in the neighborhood of the latter part of 1879; but how near, I would not be positive of; it was sometime between October and November.

Q. 18. Did you see any talking-machines there at that time?

A. Yes, sir; I saw that he had changed one part of the instrument and placed another one in position.

Q. 19. Were you there at his shop at any time during the years 1877, 1878, and down to the time of your last visit? If so, how often, to the best of your recollection?

A. During the balance of 1876, I remained at Lisburn. I started to work again in the neighborhood of March, 1877. I then was working in Harrisburg; but just what months and at what points I would not be positive of. I worked part of the time for Mr. Boyer, part of the time for William Walker, and always walked, going and coming, except some few times, when I got a chance to ride. I then, in my homeward trip, would leave Harrisburg directly after dinner, on Saturdays, as a usual thing, and, when I would leave in good time, I would very often stop at his shop. During this time, I did some work also in Lisburn, and some close points in York county. I did not work constantly in Harrisburg. I have stopped as often as twice during a month, during my work, from that time on to March, 1878. About the 25th or 26th of March, as near as I can recollect, I moved to a house owned by Jacob Eshleman, on the Lisburn road, about a half a mile from Drawbaugh's shop, at Eberly's Mills. I lived in that house from that date until April 1st, 1879. During that time I worked some little in Harrisburg, but the most of my work was done right in my immediate neighborhood. I worked for Mr. Martin Best and others. Then I was at the shop a great deal. I worked for Peter McQuate, and that drew me to the shop a good deal. He lived on the Heck farm at that time. We used to gather at the shop on rainy days, because it was a good place. During 1879, I worked at the car shops, from 1st of April, 1879, until I moved away from there. During that time I was there a few times, but not so often. About the 1st of October, 1879, I went to work for the Lochiel rolling mill, and shortly after that I made preparations to move to Harrisburg. It was between the 1st of October and the 9th of December that I was last at his shop. The last-named day was my moving day. I know my last visit was not in December, because that would have been too near my moving day.

Q. 20. During all these visits to his shop, from November, 1876, to October or November, 1879, was Mr. Drawbaugh, or was he not, still giving his attention to his talking-machine, and working at it?

A. He was doing other work, but, at the same time, he was still working on this. During the time of my visits, he was manufacturing those clocks, to a great extent. He would suddenly drop what he had in his hand, and go to this apparatus, or different parts of this talking-machine, and he would do something—what it was, I am not prepared to say—and then he would try, and test. That he has done frequently while I was in the shop. If he had a piece of clock work in his hand, he would slam it down, fairly enough, as I thought, to injure it. Then he would go to some part of this talking-machine and do something that I can't explain, but I thought he was testing it. Sometimes he would remain at it half an hour and sometimes longer.

Q. 21. Please look at the machines, "A," "B," "C," "D," "E," "F," "H," and "J," now on the table before you, and state whether you saw any of these in the fall of 1876, and if so, which ones.

A. I saw this one, "C," and "B," and "F," also "A" and "H." In regard to "D," and "E," there is so much similarity connected with them that I would not positive. The one I saw had an attachment of covered wire.

Q. 22. Did you see, during that fall, at his shop, small round machines, like "D" and "E," having wrapped wire connected with?

A. I did.

Q. 23. Is there any mark about the machine "H" which particularly attracted your attraction at that time, and was the subject of comment by you at the time?

A. Those hinges are the marks. We asked him when he had got into the coffin business.

Q. 24. Referring to the fact that the hinges look like coffin hinges?

A. Yes, sir; those were the style of hinges that were used in open-faced old style coffins, before caskets came into use. The lid was in two parts and the hinges were at the high break; the upper portion of the lid opened back to disclose the face.

Q. 25. Was the bell on top of the machine "H," at the time that you first saw it?

A. Yes, sir.

Q. 26. In what position was that machine "H," at the time you first saw it, and what did Mr. Drawbaugh do with it, or say about it, at that time?

A. It was in an upright position, on a ledge over the bench. The ledge was between two of the studding of the wall of the building. Whether the machine was fastened against the wall or not, I could not say, but it was in a firm position. While I was there he opened it, and I saw the inside of it, and he also rang the bell from some point on the outside. He explained the idea of speaking into it, and the bell was for the purpose of calling attention. I don't recollect that he called it a talking-machine or any name, in particular. His whole idea, as I understood it, was the transmission of sound. When he explained the talking, he talked into this place [indicating the round mouth-piece on the front of "H."]

Q. 27. Was the machine, "H," connected with wires and batteries, at the time you first saw it?

A. There was wires connected with it on the side, and one wire ran down from the shop, which was in the second story, down through the floor, and he explained that that wire ran into the ground.

Q. 28. When did you first see the machine "J?"

A. As near as I can recollect, I saw this towards the latter part of my visits. I recollect seeing it there. At the time I saw it, it was in the position that "H" first occupied, although this one, "H," was still in sight.

Q. 29. Were any of these machines that are here on the table, and which we have been referring to in your testimony, seen by you at the time of your visit to Mr. Drawbaugh's shop? If so, which ones?

A. "C," "F," "B," "A," and "H," and something like "D" and "E," also; and different unconnected pieces, rims, &c., were seen by me at my first visit.

Q. 30. At that time of your first visit, how did the machine "A" look? Did it appear to have been just made, or to have been made a considerable time previously?

[*Objected to by Mr. Storrow.*]

A. It looked as bad then as it does now, and, in fact, I think, worse; for then it was all marked up with grease-marks, and in fact everything was all marked up with grease; also that one, "H." A machinist's hands are always black and greasy, and, of course, in handling anything they always mark it.

AMERICAN BELL TELEP

Q. 31. Did the machines "B," "C," and "F," when you first saw them, look new or old?

A. They looked old and worn with handling.

Q. 32. From your knowledge of what was going on at Mr. Drawbaugh's shop, from the time of your first visit to your last, what answer will you make to the question, whether he kept this talking-machine in mind, and kept at work at it during that time or not?

[*Objected to by Mr. Storrow as incompetent.*]

A. My knowledge is, that he was working at it pretty nearly all his spare time, and his only drawback was the want of capital to carry it through. He was a poor man and had hard times getting along, and he had to work enough to keep his family going, as we all do; a laboring man or mechanic has very little time to throw away, especially when he has a large family to support.

Cross-examination waived by Mr. Storrow.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 15th day of November, 1881.
FRED. M. OTT,
Examiner.

JOS. C. JEFFERIES.

JOHN T. SMITH, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

My age is fifty years; my occupation, farming; residence, Franklin township, York county. I know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, and have known him since 1872.

Q. 1. How came you to get acquainted with him at that time?

A. I got a hydraulic ram put up.

Q. 2. Have you any paper or memorandum here showing the time?

A. Yes, sir; here is the bill I got when he finished the job.

[*The bill, copied by the examiner, is as follows. Offered in evidence by respondents' counsel.*

LEPHONE COMPANY,-2

"Clear Spring, York, Co., Pa.,
June 6, 1872.

John F. Smith,
to Daniel Drawbaugh, Dr.

1872.		
June 1st,	To one ram,	$15 00
	To 422 ft. ½ inch pipe @ 15 cents,	63 30
	To 50 ft. 1½ inch pipe @ 50 cents,	25 00
	To 1 union 1½ inch,	1 60
	To 2 do ½ do @ 60,	1 20
	To 1½ inch nipple,	10
	To 1½ inch ell,	15
	To 1 day putting up ram,	1 50
		$107 35

Received Payment,
Danl. Drawbaugh."]

Q. 3. Did you go to Mr. Drawbaugh's shop at the time when you got that ram?

A. Yes, sir; I was down about three weeks before he got everything fixed, and then he came up to my place and set it up for me.

Q. 4. When was the last time that you were ever at Mr. Drawbaugh's shop at Eberly's Mills?

A. In 1876.

Q. 5. At what time in 1876?

A. As near as I can tell, it was about the time when they had Pennsylvania week, or Pennsylvania day, at the Centennial, when they had excursions down. I don't know whether they had a whole week or one day, but it was in the week that had that day.

Q. 6. Are you sure that it was in the week that had that day in it?

A. I am not perfect; but I was in Dillsburg and heard the fellows talk about going to the Centennial, and that is the way I know it was pretty near that time.

Q. 7. How many times were you in Mr. Drawbaugh's shop, from the first to the last?

A. I think I was about four times; I can't tell exactly. The first time I was down to get the ram, and about three times after that, that it was out of order.

Q. 8. Did you ever see any talking-machines there at any of your visits?

A. He showed me a machine like this here pretty much [taking up "E."] It had two cords on, one green and the other red. He said it was to throw sound through, or speak through. It was not these, but pretty much like them. The cord had wire inside, with cord wrapped around it. That was all that I saw at that time; and then, about the same time, I saw that box "H." I don't remember that I ever saw "A," or "C," or "B," or "F." He might have shown me such a one as "A," but I don't recollect it.

Q. 9. When was it that you saw the large machine "H"?

A. I think I saw it between the first and last times, but before the last time, as near as I can recollect.

Q. 10. Where was it, and in what position, when you saw it?

A. It was lying on a table or bench, and the lid was open. I think some of the machinery was lying inside, but I can't tell whether it was in right shape or not.

Q. 11. Was the bell on top of it at that time?

A. Yes, sir; there was a bell on top of it.

Q. 12. Did you have any conversation with him about the large machine "H"?

A. Yes, he told me a little about it—how to make it; and that the bell is to give the alarm whenever he is ready to throw sound through.

Q. 13. Did he talk into the machine, or show you how to talk into it?

A. No, he had not showed me or had not talked in.

Q. 14. Did he say anything about getting it patented?

A. No, not that remember.

Q. 15. On how many different visits to the shop did you see any of the talking-machines, so far as you remember?

A. So far as I remember, I saw it a couple of times. Sometimes he was pretty busy when I was in the shop, and did not show it to me.

Q. 16. One of the machines that you saw was like this one, "E?"

A. Yes, it was like it, but I saw the very one this morning down in Mr. Jacobs' office, and I will step down and get it. [Witness returns with "N," and continues.] This is the one.

Q. 17. How do you distinguish this one, "N," as the one that you saw?

A. By these here two strings, [taking hold of the wrapped wires of instrument "N"]

Q. 18. Do you recollect that the size and shape of the instrument was like "N?"

A. Yes, sir.

LEPHONE COMPANY,-2

Cross-examined by Mr. Storrow:

Cross-Q. 19. How did you happen to go to Mr. Drawbaugh to get a ram?

A. He had a kind of a partner in building these rams, and he came along there one day and heard that I wanted the water brought up to my barn-yard, and he showed me something about it, and then I examined some other ones, but did not like them so well—rams made by other people—so I thought his would be the best machine.

Cross-Q. 20. Who was the partner?

A. Gardner. I forget his first name.

Cross-Q. 21. Do you mean that he went around selling rams?

A. No; but he put one up about four or five miles above my place, and then he came past my place and stopped to see whether I would not take one, too.

Cross-Q. 22. Was that the first you ever knew Drawbaugh?

A. I did not know him at that time. This man just stopped and showed me the working parts of the ram. This was about six months before I got mine.

Cross-Q. 23. Did you ever see any of his rams at any other place except your own?

A. Not before he showed me. But afterwards I went up to that place, about four miles above me, to see his ram work and to get a little information about it.

Cross-Q. 24. Who was that man who had the ram?

A. Joseph Trimmer.

Cross-Q. 25. How soon after you got your ram in did it first break down?

A. It froze and bursted the pipe for me in about eighteen months.

Cross-Q. 26. How soon after that did it break down again?

A. It broke down for me not quite a year after that. The clapper broke.

Cross-Q. 27. Did you take it to Drawbaugh's shop both times to get it mended?

A. Yes, sir.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 15th day of November, 1881.

FRED. M. OTT,
Examiner.

JOHN T. SMITH.

Adjourned until November 16th, 1881, at 10, o'clock, A. M.

November 16, 1881, *at* 10 *o'clock,* A. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

No witnesses being produced, adjourned till 3.45 o'clock, P. M., when the examination was resumed, pursuant to adjournment.

ABRAHAM FISHER, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

My age is sixty years; residence, York Sulphur Springs, Adams county; occupation, keeping a summer resort, for the last fourteen years. I know Daniel Drawbaugh, of Eberly's Mills, Cumberland Co., and have known him for twenty years.

Q. 1. Where did you live about 1868 to 1870?

A. I lived where I live now. I moved to the Springs in 1866, I think. The Springs are about twenty-four miles from Harrisburg.

Q. 2. Did you know Mr. Hursh, who was connected with the old Faucet Manufacturing Company, that were in operation there at Mr. Drawbaugh's shop, at Eberly's Mills, along about 1868 and 1869?

A. Yes, sir; I knew him well; he was a first cousin of mine.

Q. 3. He lived at or near Eberly's Mills, did he not?

A. Yes, he lived below; down at the creek; a couple of miles down; between New Cumberland and Eberly's Mills, about a mile from New Cumberland.

Q. 4. Did you visit him about that time?

A. Yes; we were together nearly every week.

Q. 5. Did you see anything of Daniel Drawbaugh about that time?

A. Yes, sir; we went up there one evening. He was connected there with Drawbaugh, and I went along up with him. I seen Drawbaugh different times out; but we went up to visit the works that evening.

Q. 6. While up there, did you have any talk with Drawbaugh about his talking-machine?

A. Yes; he was showing it to us there.

Q. 7. What did he say about it?

A. He said that he was going to bring that thing to perfection, and that he was making good progress with it.

[*Objected to as hearsay.*]

Q. 8. Did he say what it was for—what he could do with it?

[*Objected to by Mr. Storrow as above.*]

LEPHONE COMPANY,-2

A. Yes; he said it was for to talk through. He said he could talk through it some distance. He did not describe any particular distance—from one house to another in a town, or from one part of a house to another, he could convey sound. That is the way I understood him. He did not describe any particular distance.

Q. 9. Did he tell you on what principle it operated?

[*Objected to by Mr. Storrow.*]

A. By electricity.

Q. 10. Am I to understand you that he then showed you some of his talking-machines at that time?

A. Yes; he showed me that one box there at my side, [indicating "B" and "F."]

Q. 11. How long was that after Mr. Hursh went into the faucet business?

A. I don't think that it was over a year—not much.

Q. 12. Did you ever have occasion to get a hydraulic ram from Mr. Drawbaugh?

A. I did.

Q. 13. When did you get it from him?

A. In 1874, in the latter part of May.

Q. 14. Have you verified this date by looking at any books or memoranda made at the time?

A. Yes, sir.

Q. 15. When you got that ram, did you see Mr. Drawbaugh and have any talk with him at his shop?

A. Yes, sir.

Q. 16. Have you ever been at his shop since?

A. No, sir; I think not.

Q. 17. In the talk at his shop, at the time you got the ram, in May, 1874, was anything further said about his talking-machines?

A. Yes.

Q. 18. Did he show you any more talking-machines at that time?

A. Yes; he did.

Q. 19. Please look at this machine "A," and see whether you have any recollection of having seen it before to-day, and if so, when and where you first saw it?

A. He showed me different ones. I wouldn't like to swear that I saw this, but it strikes me that I saw this here "A." He showed me different ones that he was making—improvements that he was making.

Q. 20. Did he say anything at that time about patenting the invention?

A. He did.

Q. 21. What did he say about it?

A. He said that he had made application, or was going to; I would not be qualified as to which.

Q. 22. Did you have any conversation with him about the talking-machine between these two conversations that you have testified about?

A. I don't recollect.

Cross-examined by Mr. Storrow:

Cross-Q. 23. How did you come to go to Drawbaugh to buy a ram?

A. Because I was acquainted with him.

Cross-Q. 24. What did you pay him for the ram and putting it in?

A. I paid him about sixty dollars.

Cross-Q. 25. Did you ever see any of his rams anywhere else?

A. I did.

Cross-Q. 26. Where?

A. At Mr. Brant's, Harry Peters', and there was one working at Eberly's Springs. I don't know that I visited any others. I saw some others, but don't remember where. I think one was at Oyster's Point.

Cross-Q. 27. Did yours work right along, or did it ever break down?

A. It worked right along, as long as there was not muddy water. I did not use it then, as it threw muddy water up into the receptables at the house. This muddy water troubled me so much that I took it out in the summer of 1875.

Re-direct by Mr. Hill:

Q. Q. 28. Do you remember how much of that sixty dollars was paid for iron pipes that Mr. Drawbaugh furnished with the ram?

A. Not exactly, but it was over half. I forget how it ran. I think the pipe and the things cost a little more than the ram. I don't know exactly.

Q. Q. 29. Do you recollect whether the ram itself cost over fifteen dollars, outside of the labor and pipes?

A. I think fifteen or eighteen was the price of the ram itself, outside the attachments and labor.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 15th day of November, 1881.
FRED. M. OTT,
Examiner.

ABRAHAM FISHER.

N. N. HUBLER, *being produced, sworn, and examined, saith:*

Examined by Mr. Hill:

My age is forty-one; residence, 1205 Two-and-a-Half street, Harrisburg; occupation, foreman car-builder at the Harrisburg Car-works. I know Daniel Drawbaugh, of Eberly's Mills, and have known him since the fall of 1873.

Q. 1. How came you to make his acquaintance in the fall of 1873?

A. I was teaching music at Eberly's Mills.

Q. 2. How long did you teach there?

A. I was there once a week for about four months.

Q. 3. In what month did your school begin?

A. To the best of my knowledge, about the last of October or first of November.

Q. 4. While there teaching did you have any conversation with Mr. Drawbaugh about his talking-machines? If so, how many times?

A. I spoke with him several times; about the time I came there, and I recollect in January, 1874.

Q. 5. Did he show you some of his talking-machines?

A. He showed me some that are here now—or all these. I saw this, "I," and this, "B," and this, "F," and this, "C." I am not so sure about this one, "A."

Q. 6. Is the instrument "C," all here as you saw it then?

A. There was a magnet on it, then, like this [indicating "C" reproduced,] but I don't think the magnet was quite as large as the one on "C." reproduced

Q. 7–8. Did he talk to you through the machines?

A. He did not talk to me, [but he said he had talked to others.] I wanted him to talk to me, but the wires at that time were out of order, he said.

[*Part in brackets objected to by Mr. Storrow as hearsay.*]

Q. 9. At the conversation in January, 1874, did he say anything about patenting the invention? If so, what?

A. He said that he had it about completed, and was ready to have it patented. He said he did not have means, hardly, to do it, but would have to find some way to push it through.

Q. 10. Did any of his children attend your school?

A. There were two.

Q. 11. What did their tuition amount to?

A. One dollar a piece.

Q. 12. Did he pay you the tuition when you first asked him for it, or did he ask delay?

A. He told me that he did not have the money to pay me at the beginning, and said that if it did not make any difference to me he would pay at the end of the course. He said he did not have any money then. He spoke about his experimenting with these things.

Cross-examined by Mr. Storrow:

Cross-Q. 13. When did he pay you?

A. About the end, or very near the end, of the quarter.

Cross-Q. 14. Which of his children went to your school?

A. A son and a daughter; I don't remember the first names. One of them—the son—is grown up and works here in town. I find, from statements now made to me, that the one I have reference to, is "Shorty" Drawbaugh, who, I am told, is a nephew; I thought he was a son. Daniel Drawbaugh subscribed and paid for him.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 16th day of November, 1881.
FRED. M. OTT,
Examiner.

N. N. HUBLER.

Adjourned until November 17, 1881, at 10 o'clock, A. M.

November 17, 1881, 10 *o'clock*, A. M.

No witnesses being produced, after waiting until 11 o'clock, A. M., adjourned until 2.30 o'clock, P. M.

November 17, 1881, 2.30, P. M.

Examination resumed pursuant to adjournment.

Present same counsel, with the addition of Mr. Smith for complainants.

Mrs. LYDIA DRAWBAUGH, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

I reside at Milltown, Cumberland Co., Penna., and am the wife of

George W. Drawbaugh. I am acquainted with Daniel Drawbaugh, of Eberly's Mills, Cumberland county, and have known him for about fifteen years.

Q. 1. Were you ever present at his shop when he was showing his talking-machines to anybody?

A. Yes, sir; once.

Q. 2. When was that?

A. In the year 1872, in the month of September.

Q. 3. Who was there in the shop with you?

A. Mrs. George Free; and there was a third person whose name I do not remember.

Q. 4. Did Mr. Drawbaugh talk to you through the talking-machines at that time?

A. No, sir.

Q. 5. Did he talk to the others of your party through the machines at that time?

A. I did not hear him.

Q. 6. Do you recollect what you were doing while the others were looking at the machines?

A. I was looking at some drawings that he had placed on the wall.

Q. 7. Did you see the talking-machines?

A. Yes, sir.

Q. 8. Is Mrs. Free, who accompanied you, your sister, and is she here present?

A. Yes, sir; she is my sister, and she is here present.

Cross-examined by Mr. Storrow:

Cross-Q. 9. When were you married?

A. In 1867.

Cross Q. 10. Where did you first live after you were married?

A. At Milltown.

Cross-Q 11. How long did you live there before you moved away?

A. I still live there.

Cross-Q. 12. What house do you live in?

A. At the upper end of Milltown; the second house as you come in from Mechanicsburg.

Cross-Q. 13. Where were these instruments when you saw them—in what part of the shop?

A. They were on the second floor.

Cross-Q. 14. Was that floor partitioned off then the way it is now?

A. I have not been in it lately. I cannot say.

Cross-Q. 15. How long were you there on that visit?

A. I can't just remember how long.

Cross-Q. 16. Is it your recollection that you were in there four or five minutes only, or that you stayed there a half hour or longer time?

A. I could not say whether it was a half hour or longer.

Cross-Q. 17. I understand you to mean that you did not just go in and stay there four or five minutes and come out again, but stayed there quite a little while. Is that so?

A. Yes, sir.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 17th day of Nov., 1881.
FRED. M. OTT,
Examiner.

MRS. LYDIA DRAWBAUGH.

MRS. MARY FREE, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

I am the wife of Mr. George Free, and reside at White Hill, Cumberland county, Pennsylvania. I am acquainted with Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pennsylvania, and have known him about fourteen years.

Q. 1. You heard the testimony which your sister, Mrs. Drawbaugh, has just given, did you not?

A. Yes, sir.

Q. 2. Do you recollect the visit to Mr. Daniel Drawbaugh's shop about which she testified?

A. Yes, sir.

Q. 3. In what year and month was that visit?

A. In 1872, in the month of September.

Q. 4. Did you see the talking-machines while there on that visit?

A. Yes, sir; I did.

Q. 5. Did you hear anything said through them by anybody?

A. Yes, sir; I did. Mr. Drawbaugh said "Good afternoon, ladies."

Q. 6. Was Mr. Drawbaugh in the same room with you, when he talked through the machine, or in some other part of the building?

A. He went to another part of the building.

Q. 7. Do you know whether he went down stairs, or whether he went to some other part of the same floor?

A. I really could not tell that.

Q. 8. Did he go out of the room for the purpose of talking to you ladies through the machine, in order that you might hear it for yourselves?

A. Yes, sir; he did.

Q. 9. Was it while he was out of the room that you heard the words "Good afternoon, ladies," spoken through the machine?

A. Yes, sir.

Q. 10. Did he speak other words through the machine to you, which you heard, or was that all he said through the machine?

A. He said more, but I have forgotten what they were.

Q. 11. Could you plainly hear through the machine what he was saying or not?

A. Yes, sir.

Q. 12. Did he whisper or sing through the machine to you also?

A. No, sir; just talked.

Q. 13. Were there any wires connected to the machine?

A. There were.

Q. 14. Did he tell you how the machine operated, or what it was that conveyed his voice through to you?

A. He said it was by electricity.

Q. 15. Do you remember whether or not his voice sounded like the voice of Daniel Drawbaugh? That is, whether, when he was talking to you through the machine, you could distinguish the voice as being Daniel Drawbaugh's voice, and as not being the voice of some one else?

A. Yes, sir; I recognized it as his voice.

Q. 16. Do you remember who the person was who was there with you and your sister?

A. No, sir.

Cross-examined by Mr. Storrow:

Cross-Q. 17. Is your husband, Mr. Free, present?

A. Yes, sir.

Cross-Q. 18. Is he the Mr. George Free who has testified in this case?

A. Yes, sir.

Re-direct by Mr. Hill:

Q. Q. 19. Did your husband accompany you here at your request after you had been subpœnaed?

A. Yes, sir; he did.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 17th day of November, 1881.

FRED. M. OTT,
Examiner.

MRS. GEO. FREE.

Adjourned until November 18th, at 10 o'clock, A. M.

November 18, 1881, 10 *o'clock*, A. M.

No witnesses being produced, adjourned until 2.30 o'clock, P. M.

November 18, 2.30 *o'clock*, P. M.

Examination resumed pursuant to adjournment.

Present, Mr. Smith and Mr. Storrow for complainants, and Mr. Jacobs for respondents.

GEORGE LEONARD, *being produced, affirmed, and examined, saith:*

Examined by Mr. Jacobs:

My age is seventy-one; reside near New Kingston, Cumberland county; occupation, farmer. I know Daniel Drawbaugh, of Eberly's Mills, and have known him for about ten years.

Q. 1. Did you ever reside at Eberly's Mills, and if so, from what time to what time?

A. From 1871, when I went there; and I left in 1878, I think. It was three years ago last spring that I left.

Q. 2. State whether or not you were, during a part of that time, the owner of the mill at that place.

A. Yes, sir; five years I owned the mill and carried it on; that was my occupation—milling and selling flour; but I lived there two years after I sold the mill; so that I lived there seven years in all.

Q. 3. When did you purchase and take possession of the mill?

A. I think I purchased the mill the January before I moved there.

I moved there in the spring of 1871. I could have had possession of it two or three weeks before, but I did not take it, as they were doing nothing.

Q. 4. Then I understand that you owned and had possession of the mill from 1871 to 1876. Is that correct?

A. Yes, sir; it was in 1876 that Dellinger and May got possession.

Q. 5. William S. Dellinger?

A. Yes, sir; that is his name.

Q. 6. In what month, if you remember, did they take possession?

A. The first of March, 1876, I suppose. They got the possession of the mill on the first of March, but there were four houses that they did not get possession of until the first of April. They were in the possession of tenants up to that time.

Q. 7. Whom did you succeed in the possession of the mill?

A. John Beetem; he and Christ. Eberly owned it together. Mr. Hepburn, of Carlisle, did the business for Mr. Eberly, and George Beetem acted in the matter for his brother John.

Q. 8. Was John Beetem a Carlisle man?

A. He was at that time. He got to drinking and doing badly, and his brother George had to manage his business for him. That was what I understood at the time.

Q. 9. State whether or not, during the time you ran the mill, you had any business transactions with Daniel Drawbaugh. If so, what was their nature?

A. He bought flour for the support of his family, and, occasionally, hog-feed; he kept a couple of hogs, or three.

Q. 10. Did he always pay you in cash?

A. No, sir; he would very often pay a part, and a part we would book.

Q. 11. State whether or not, during that time, he was often in your debt for flour and feed.

A. Yes, sir; I think he was never clear of it from the time I commenced dealing with him till I went away.

Q. 12. Did you ever ask him to pay?

A. Yes, sir; I asked him at the end of every year and tried to settle up with him, as I wanted to use the money myself.

Q. 13. What reason, if any, did he give for not paying you off?

A. He still said that he had not the money.

Q. 14. Were you at the Centennial, and if so, when and with whom did you go?

A. Yes, sir; I went in company with Mr. Daniel Drawbaugh. I think it was somewhere about the middle or 20th of October, 1876.

Q. 15. What did the trip cost you?

A. I think about ten dollars, as near as I can tell, including all my expenses, boarding, lodging, fare, &c.

Q. 16. Had Mr. Drawbaugh ever said anything to you about his talking-machine before you went with him to the Centennial, and if so, when, as near as you can recollect?

A. I heard him talk that he was working at a talking-machine some time between the years 1871 and 1876, and I heard some of the neighbors saying, too, that he was working on such a thing, but I never saw it. He told me himself that he was working at it, but I cannot say I ever saw it. I may have seen it, but I cannot say I did, because I took no interest in it. I did not understand the thing. It was not in my line of business.

Cross-examined by Mr. Smith:

Cross-Q. 17. How long a time did you and Mr. Drawbaugh spend at the Centennial?

A. As near as I can recollect, about three days.

Cross-Q. 18. Where did you board while there?

A. We boarded at a private house, perhaps a mile out from the Centennial grounds. I am not able to give the name and the street, as I am so little acquainted in Philadelphia. I had an account in a little pass-book, but I lost it. It was an Irish family that we boarded with.

Cross-Q. 19. Did any other persons go in company with you and Mr. Drawbaugh?

A. No, sir; not to that place.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 18th day of November, 1881.
FRED. M. OTT,
Examiner.

GEO. LEONARD.

WILLIAM F. LENIG, *being produced, sworn, and examined, saith:*

Examined by Mr. Jacobs:

My age is forty; residence, 1524 Vernon street, Harrisburg; occupation, blacksmith; I am now running machinery. I quit my trade because I could not stand it. I am employed at the Harrisburg Car Works. I know Daniel Drawbaugh, of Eberly's Mills, and have known him since 1874—about eight years.

Q. 1. How did you come to make his acquaintance?

A. Mr. Hubler was teaching singing-school at Eberly's Mills, or Milltown, and he wanted me to go along over to see some of Mr. Drawbaugh's machinery—that he had a great invention called the talking-machine. I concluded then to go along to see this machine. After I got there, I seen it, and I thought it was a humbug the time I looked at it. He then had his wires stretched through his shop some place Mr. Hubler then asked him whether he could talk through. He said he could not at the present, but that he had talked through before—that one of the wires was unhooked, or something.

Q. 2. Did he say anything about the use of electricity in connection with it?

A. Yes, sir; he did. He told us—whether it was in his cellar or outside of his shop, I am not sure. I know that he would have taken us down, but it was a windy night, and the light blew out.

Q. 3. Did he tell you how far he thought he could talk through it?

A. He told us then that he could talk hundreds of miles through that.

Q. 4. Did he or not say anything about getting it patented, and if so, what did he say?

A. He did afterwards. He said then, he is about ready, or soon ready, to get it patented, but that he had not the money or "stamps," or something like that.

Q. 5. Do you mean that he said that upon the night you have mentioned, or at a subsequent time?

A. Yes, sir; he mentioned it the same evening.

Q. 6. Please look at the instrument which I now show you, marked "C," and say whether you saw it at that visit.

A. I recognize this here instrument; something more was on top of it, in the shape of something like that [pointing to horse-shoe magnet of "C reproduced."]

Q. 7. Same question as to instrument marked "A."

A. I seen something similar to this here [indicating "A."] He called it a mouth-piece.

Q. 8. Did he tell you what it was for?

Q. 14. Were you at the Centennial, and if so, when and with whom did you go?

A. Yes, sir; I went in company with Mr. Daniel Drawbaugh. I think it was somewhere about the middle or 20th of October, 1876.

Q. 15. What did the trip cost you?

A. I think about ten dollars, as near as I can tell, including all my expenses, boarding, lodging, fare, &c.

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A. I heard him talk that he was working at a talking-machine some time between the years 1871 and 1876, and I heard some of the neighbors saying, too, that he was working on such a thing, but I never saw it. He told me himself that he was working at it, but I cannot say I ever saw it. I may have seen it, but I cannot say I did, because I took no interest in it. I did not understand the thing. It was not in my line of business.

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Cross-Q. 18. Where did you board while there?

A. We boarded at a private house, perhaps a mile out from the Centennial grounds. I am not able to give the name and the street, as I am so little acquainted in Philadelphia. I had an account in a little pass-book, but I lost it. It was an Irish family that we boarded with.

Cross-Q. 19. Did any other persons go in company with you and Mr. Drawbaugh?

A. No, sir; not to that place.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 18th day of November, 1881.
FRED. M. OTT,
Examiner.

GEO. LEONARD.

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Q. 1. How did you come to make his acquaintance?

A. Mr. Hubler was teaching singing-school at Eberly's Mills, or Milltown, and he wanted me to go along over to see some of Mr. Drawbaugh's machinery—that he had a great invention called the talking-machine. I concluded then to go along to see this machine. After I got there, I seen it, and I thought it was a humbug the time I looked at it. He then had his wires stretched through his shop some place Mr. Hubler then asked him whether he could talk through. He said he could not at the present, but that he had talked through before—that one of the wires was unhooked, or something.

Q. 2. Did he say anything about the use of electricity in connection with it?

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A. He told us then that he could talk hundreds of miles through that.

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A. He did afterwards. He said then, he is about ready, or soon ready, to get it patented, but that he had not the money or "stamps," or something like that.

Q. 5. Do you mean that he said that upon the night you have mentioned, or at a subsequent time?

A. Yes, sir; he mentioned it the same evening.

Q. 6. Please look at the instrument which I now show you, marked "C," and say whether you saw it at that visit.

A. I recognize this here instrument; something more was on top of it, in the shape of something like that [pointing to horse-shoe magnet of "C reproduced."]

Q. 7. Same question as to instrument marked "A."

A. I seen something similar to this here [indicating "A."] He called it a mouth-piece.

Q. 8. Did he tell you what it was for?

A. Yes, sir; he said that was to talk through.

Q. 9. By what name did he then call it, if you recollect?

A. He then called it the talking-machine; that is about the only name he had for it.

Q. 10. Can you fix the month as well as the year of that visit?

A. It was either January or February, 1874; I could not certainly say which.

Q. 11. And the visit was to Drawbaugh's shop, at Eberly's Mills, or Milltown, as I understand?

A. Yes, sir.

Cross-examination waived by Mr. Smith.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 18th day of November, 1881.

FRED. M. OTT,
Examiner.

WILLIAM F. LENIG.

Adjourned until 5 o'clock, P. M.

Nov. 18, 1881, 5 *o'clock,* P. M.

Examination resumed, pursuant to adjournment.

Present, Mr. Storrow and Mr. Smith for complainants, and Mr. Jacobs for respondents.

SAMUEL M. HERTZLER, *being produced, affirmed, and examined, saith:*

Examined by Mr. Jacobs:

My age is forty-six; residence, Eberly's Mills, Cumberland county; occupation, farming. I know Daniel Drawbaugh, of Eberly's Mills, and have known him since 1866.

Q. 1. Have you any knowledge of his pecuniary condition between the years 1870 and 1880, and if so, state what it was.

A. He was very poor; at times he had money, but it did not last very long.

Q. 2. Did you have any transactions with him during that period?

A. Yes, sir; he would very frequently buy as small a quantity as a half peck of apples, and had no money to pay for it; and he would buy lard—about two pounds at a time; and mince-meat, generally two pounds at a time, and did not pay for any of it.

Q. 3. Did he or not pay you cash when he had it?

A. Yes, sir; he did. When he had it he always paid cash. He mostly sent the children for those articles. When they had not the money the children would always say their father would fix this with me.

Q. 4. Do you remember the time of his father's death, and if so, when was it, and what occurred between you and Mr. Drawbaugh?

A. I remember the time, but the date I cannot fix. I remember what occurred, but the year has slipped my memory entirely. He came to my place in the evening, when the next day the funeral of his father was to be, and he said that he would like to attend the funeral, and wanted to know if I would give him enough money to pay his way. I then asked him whether he was going alone. He said his wife should go, but he was afraid that he could not get the money for them both. I asked him about the children. He said that they have not got the clothes. I think that was the excuse he made about the children, that they had not clothes suitable. I then asked him how much the fare would be to Newville, where his father lived, and he thought about ninety cents, one way, would be the cost of a ticket. Then I asked him whether he thought five dollars would be enough. He said that it would. I gave him five dollars, and he gave me a due bill, and promised that he would pay it in a very short time. He never paid it in money. He spoke of it different times and said that he was ashamed that he could not pay me, but that he would pay it before long.

Q. 5. How did he pay that, if he ever did?

A. I don't think he ever gave full value for it. He filed my saws several times and done me favors in that way. He fixed a pruning shears—put a spring in. I remember that very distinctly.

Q. 6. Can you approximate the date of this occurrence?

A. I could have fixed the time exactly from my accounts if I had referred to them. To the best of my recollection, it was from 1868 to 1878. As to the funeral, I remember the occurrence, but can't fix the date. The buying of the lard and other things were from 1866 on.

Cross-examined by Mr. Storrow:

Cross-Q. 7. Was this the night before the funeral that he came to you?

A. It was the evening when the funeral was to be the next day.

Cross-Q. 8. Summer or winter?

A. I think it was in the fall.

Cross-Q. 9. How long have you lived at Eberly's Mills?

A. Since 1866.

Cross-Q. 10. You own a rather large farm there, don't you?

A. I suppose my two together would make a large farm.

Cross-Q. 11. Your two farms would be about the biggest any one owns there, wouldn't they?

A. Yes, that joins Eberly's Mills.

Cross-Q. 12. How many acres in both of them together?

A. Something over two hundred.

Cross-Q. 13. Was Mr. George Leonard reckoned among the neighbors to be a man pretty well off in means?

A. Tolerably well, at one time.

Cross-Q. 14. I understand you to mean that the way you knew that Drawbaugh had not the cash to pay you was by his children saying that their father would fix it with you. Is that the fact?

A. No, sir; when he had the money, he would send it with the children; and when he was to fix it with me I would charge it, and he would never fix it from one year's end to another; and if I would ask him about his account he would say that he would pay it as soon as he gets the money, but he had not the money. That is the reason the children had them orders.

Cross-Q. 15. You were a member of the Drawbaugh Manufacturing Company, were not you?

A. Yes, sir.

Cross-Q. 16. Did he do repairs for you before the time when his father died?

A. Yes, sir; he did.

Cross-Q. 17. What kind of repairs?

A. He ground my shears several times.

Cross-Q. 18. Did he do repairs for the neighbors generally?

A. Yes, sir; he would do favors of that kind and would drop almost anything to do them.

Cross-Q. 19. Did he repair reapers and farm machinery for the neighbors during that time?

A. He never did for me, but I seen reapers and corn-shellers there at Dan's shop at different times.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 18th day of November, 1881.
FRED. M. OTT,
Examiner.

S. M. HERTZLER.

Adjourned until December 1st, 1881, at 2 o'clock, P. M.

Thursday, December 1st, 1881, 2 *o'clock,* P. M.

Examination resumed pursuant to adjournment.

Present, Mr. Hill for respondents, and Mr. Storrow for complainants.

WILLIAM H. H. KNIGHT, *being produced, sworn, and examined, saith:*

Examined by Mr. Hill:

My age is thirty-two; residence, Washington, D. C.; occupation, civil and mechanical engineer and draughtsman.

Q. 1. Have you been accustomed to making mechanical drawings, to be filed in the Patent Office, in connection with applications for patents?

A. I have.

Q. 2. Have you been accustomed to making accurate plans and drawings for the construction of machinery, and also drawings from machinery?

A. I have.

Q. 3. Are you familiar with the telephone instruments marked alphabetically from A to Q, inclusive, which have been referred to here in this case by the various witnesses for the defense?

A. I am.

Q. 4. Have you made drawings of those instruments to be filed with the evidence in the case?

A. I have made such drawings, twenty-five sheets in number.

Q. 5. Will you produce the twenty-five sheets that you have made in order that I may put them in evidence?

A. I here produce the drawings referred to in the last answer.

[*Mr. Hill puts the twenty-five sheets of drawings in evidence, marked as follows:*

Exhibit A drawing.
" B drawing.
" reproduced B drawing.
" C drawing.
" reproduced C drawing.
" D drawing.
" E drawing.
" F drawing.
" G drawing.
" reproduced F drawing.
" H drawing, sheet 1.
" H drawing, sheet 2.
" H drawing, sheet 3.
" I drawing.
" K drawing.
" reproduced I drawing, No. 1.
" reproduced I drawing, No. 2.
" J drawing, sheet 1.
" J drawing, sheet 2.
" J drawing, sheet 3.
" L drawing.
" M drawing.
" reproduced L drawing.
" reproduced M drawing.
" N drawing.
" O drawing.
" Q drawing.
" P drawing, sheet 1.
" P drawing, sheet 2.
" reproduced P drawing, sheet 1.
" reproduced P drawing, sheet 2.
" reproduced P drawing, sheet 3.

Mr. Hill also puts in evidence photo-lithographs of said respective drawings.]

The original drawings, above put in evidence, are full-size drawings of the several machines. The photo-lithographs are photo-lithographs of the said full-size drawings, but were reduced to half-size by the photo-lithographer; so that, although they bear the words "full-size," those words refer to the original drawings, and not the photo-lithographs.

[*The photo-lithographs, now put in evidence, are marked respectively as follows, to wit:*

Exhibit photo-lithograph A drawing.
" " " B drawing.
" " " reproduced B drawing.
" " " C drawing.
" " " reproduced C drawing.
" " " D drawing.
" " " E drawing.
" " " F drawing.
" " " G drawing.
" " " reproduced F drawing.
" " " H drawing, sheet 1.
" " " H drawing, sheet 2.
" " " H drawing, sheet 3.
" " " I drawing.
" " " K drawing.
" " " reproduced I drawing, No. 1.
" " " reproduced I drawing, No. 2.
" " " J drawing, sheet 1.
" " " J drawing, sheet 2.
" " " J drawing, sheet 3.
" " " L drawing.
" " " M drawing.
" " " reproduced L drawing.
" " " reproduced M drawing.
" " " N drawing.
" " " O drawing.
" " " Q drawing.
" " " P drawing, sheet 1.
" " " P drawing, sheet 2.
" " " reproduced P drawing, sheet 1.
" " " reproduced P drawing, sheet 2.
" " " reproduced P drawing, sheet 3.]

Q. 6. Have you examined the photo-lithographs which I have jnst put in evidence? If yes, state whether they are accurate reproductions of the original drawings, and upon what scale, as compared with the original drawings.

A. I have; they are accurate copies, one-half size of original drawings.

Q. 7. State whether you made the original drawings from the machines marked from "A" to "Q," inclusive, which have been referred to by defendants' witnesses.

A. I did, and, in all instances, made as correct a drawing as I possibly could.

Q. 8. Upon what scale are the original drawings made, as compared with the machines which they represent?

A. They are made to the actual size of the machines—full size.

Q. 9. Is each part, which is shown in the drawings, made of the actual size of and dimensions of the corresponding part in the machine represented?

A. They are, as nearly as I could make them, by measurement with instruments.

Q. 10. Did you measure each part of every instrument, in order to obtain the actual dimensions correctly?

A. I did; I measured them with calipers and dividers.

Q. 11. How did you obtain the relative positions of the different parts—their distances from each other, and their arrangement in the several machines?

A. By measurement.

Q. 12. Did you employ a very unusual amount of care in securing perfect accuracy in these drawings, or only the ordinary care?

A. I gave these drawings more care than I ever bestowed on any other drawing. In all cases I remeasured to see that I was perfectly correct. Sometimes I went over them four or five times after penciling them.

Q. 13. Then are you willing to swear that these drawings are perfectly accurate, so far as accuracy can be obtained by the ordinary drawing and measuring instruments?

A. I can, I think.

Q. 14. You stated orally here, a little while ago, that one of the drawings, to wit: The one marked "Exhibit reproduced I drawing, No. 1," was made in part, not from the machine itself, but from explanation and statements given to you by Mr. Daniel Drawbaugh, at the time. Is that the fact?

A. It is; the body of the instrument I copied from the original instrument marked "I." The works contained within said body were drawn from explanations given by Mr. Drawbaugh. During the time that I was making the drawing, Mr. Drawbaugh brought over the instrument, "reproduced I," which I compared with the drawing.

Q. 15. Where did you make all the drawings?

A. At the office of M. W. Jacobs, Harrisburg, Pennsylvania.

Q. 16. I observe that the several drawings are dated. What are those dates intended to show?

A. The time at which each drawing was made.

Q. 17. Were the several machines adjusted to an actual working adjustment when you made the drawings, or only adjusted approximately?

A. I could not say as to that, not having used or experimented with them. From their appearance in many cases I should judge them to have been in working condition.

Q. 18. Where you found any part of the machine wanting, that part was omitted in the drawing, was it?

A. In all but one case, to wit: "Exhibit K drawing," I added the connecting piece marked *é*. Mr. Drawbaugh stated that the piece had been there, and the soldering on the instrument showed that it had been broken off, and there was an aperture in the diaphragm to receive it. In two or three of the carbon instruments, I represented the missing carbons by dotted lines.

Q. 19. In "Exhibit B drawing," the electro-magnet is represented at a greater distance from the diaphragm end of the tube than in "Exhibit reproduced B drawing." State whether that electro-magnet in the original machine was somewhat loose in its fastening, by reason of age, so as to be easily moved towards or from the tube.

A. The electro-magnet was confined to a block, and held thereto quite rigid, but the tube [marked B] was loosely held by the strap [marked C] and while the strap prevented the tube from dropping out, it would not and did not prevent longitudinal movement of said tube. I did not at the time of drawing try to obtain any particular adjustment of the tube to the magnet, as I did not think of it. I only aimed at giving relative size of each.

Q. 20. Did you put the letters of reference on the several drawings, and if so, for what purpose?

A. I did; in order that each part might be readily found and distinguished.

Q. 21. I suppose you found it necessary to take many of the machines apart, in order to measure the dimensions of their component parts, did you not?

A. I did.

Q. 22. When you had done this, did you put them together again as accurately as you could?

A. I did, as nearly as possible.

Cross-examined by Mr. Storrow:

Cross-Q. 23. When did you first see any of these instruments?

A. I first saw them one year ago last summer, or spring. I think in June or July, 1880.

Cross-Q. 24. Where?

A. At Washington.

Cross-Q. 25. Where, in Washington?

A. At the office of L. Hill, 617 Seventh street.

Cross-Q. 26. What occasion had you to see them then?

A. I made Patent-Office drawings for some of them.

Cross-Q. 27. Which?

A. I do not just remember which they were; but think instruments "J," "L," and "M" were among the number. I would say, however, in making office drawings, I do not charge my mind with the remembrance of the machines drawn.

Cross-Q. 28. In "Exhibit A," what is the bracket F and its adjusting screw made of?

A. The bracket, I think, is of brass, and also the adjusting screw, I think. I have not the machines before me, but that is as nearly as I can remember.

Cross-Q. 29. In "Exhibit B," what is the piece H made of?

A. Of tin, as nearly as I can remember.

Cross-Q. 30. I see that you have called it "H, tension plate to tighten diaphragm." Who gave you that name for it, and who told you what it was for?

A. I knew its purpose myself, from my knowledge of mechanics. I had in my mind another term to apply to it, and I asked Mr. Drawbaugh what would be the shop term.

Cross-Q. 31. Was there any diaphragm on the instrument when you first saw it?

A. A portion of the diaphragm was surrounding the tube, held in place by twine, as it is now, or was when I last saw it.

Cross-Q. 32. The end of the tube was entirely open, was it not?

A. It was.

Cross-Q. 33. Where did you ever see a device like H, used to tighten a diaphragm?

A. I do not remember having seen it in any telephone, but the plate H corresponds to springs that I have seen used in machines, for the

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purpose of pressure or tension. From this fact, I judged that it was so used in this instrument.

Cross-Q. 34. Did you ever see such a spring used to produce tension in a vibrating diaphragm? If so, where?

A. As I before stated, I do not remember having seen such a spring in a telephone, but have seen such springs in other machines.

Cross-Q. 35. Did you ever see such a spring used in connection with a diaphragm in any kind of a machine? If so, what?

A. The machines I had in mind more particularly were cord tensions in harvester-binders, and the tensions in certain sewing-machines.

Cross-Q. 36. Your drawing of "Exhibit C" states that a second or auxiliary diaphragm of gold-beater's skin was originally used. Did such a diaphragm exist in that instrument when you first saw it?

A. When making this drawing, I noticed a fragment on the edge of what appeared to be paper or bladder or something of that nature, surrounding the body of the instrument, and held in place by a flange or ring. I asked Mr. Drawbaugh what the purpose of this fragment was. He answered that it was a portion of a diaphragm of gold-beater's skin that had once been used in the instrument.

Cross-Q. 37. In your drawing of "Exhibit C reproduced" you say: "This instrument is similar in all respects to original instrument marked 'C.'" I suppose you mean by that that they are similar in those respects in which your drawings show no difference, do you?

A. I meant by that note that the sizes of the base, upright, and body of the instrument were similar, and the relation of each of the parts named was similar, so far as was shown. The object of this note in the drawing of the reproduced instrument was merely to avoid making drawings that I did not deem necessary. I mean the front elevation, rear elevation and section, such as I made for "C."

Cross-Q. 38. Has "C reproduced" got an auxiliary diaphragm of gold-beater's skin?

A. I do not now remember. It has been some time since I saw the instrument.

Cross-Q. 39. In "Exhibit D," of what material is the adjustable plug *é* made?

A. It is made of soft iron, as nearly as I can remember.

Cross-Q. 40. Of what material are the cheeks between which the coil of "D" is wound? I refer to the plates that carry the letters C—the two ends of the spool.

A. I do not at this moment remember, but think they are of brass.

Cross-Q. 41. Of what material is the diaphragm?

A. Of tinned iron.

Cross-Q. 42. What material is it in "E?"

A. I think in that case, if I remember rightly, it is of sheet-iron.

Cross-Q. 43. In "Exhibit F," is that part of the adjusting rod C, which is above the plates, straight or bent?

A. It is straight. It passes out through the cap at a slight inclination from the perpendicular.

Cross-Q. 44. About parallel to the side of the tumbler, is it not?

A. Yes; the drawing shows a slight inclination, but, as you are looking directly at it, you do not see the inclination perfectly.

Cross-Q. 45. The ragged line at the bottom of the tumbler in your drawing signifies the way in which the bottom is broken off, I suppose?

A. It does; as it appeared when making the view shown in the drawing.

Cross-Q. 46. In your drawing of "G," I observe, in dotted lines, something which you have called "H—carbon ball." I understand from your direct testimony that the instrument did not contain what you have shown as a ball, when it came to your hands, and that that is the reason why you put it in dotted lines. Is that so?

A. In my direct testimony, I stated that when the carbon balls were missing, the position was shown by dotted lines in two or three instances. In the instrument in question, there was one carbon ball that is lettered "H," the dotted lines not being lettered. The photo-lithograph does not bring that out clearly. In the original drawing, the "H" is placed in the clear space beside the carbon ball, a reference line being drawn from said ball to the letter.

Cross-Q. 47. In "F reproduced," of what material is the bar *e*?

A. I think it is a small iron wire.

Cross-Q. 48. I suppose you did not undertake to draw that to scale, as to diameter?

A. Yes, sir; I measured that with calipers.

Cross-Q. 49. Is the drawing "H, sheet 2," one of the cases where you represented by dotted lines something which did not exist in the instrument when you saw it?

A. In this drawing, the carbons that are dotted are not in the instrument, but the dotted portions shown on the body of the instrument, on its side, represent the screws for attaching binding-posts to the wood,

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the outline of the switch-screw L, and the stem or shaft, of the button or key K^2, and the outline of the switch contact L^2, also the clapper-stem of the bell, where it passes through the wood. In the longitudinal section, body of screw g^2 is indicated by dotted lines, as is also a rivet not marked. The carbons indicated by dotted lines are the only parts so indicated that are wanting in the machine.

Cross-Q. 50. I observe that you have two sheets of drawings of "Exhibit I." I suppose that the one dated April 28, 1881, represents the instrument as it then existed, does it not?

A. That is the original instrument. The drawings are made as accurately, as regards size, as I could make them.

Cross-Q. 51. The diaphragms and electro-magnet shown in your drawing of July 12, 1881, were added to the instrument after you made your drawing of April 28, 1881, were they not?

A. The drawing of instrument "I" was made July 12th, as I stated before, partly from the old instrument and partly from explanations made by Mr. Drawbaugh, and partly from having the magnets placed in the instruments. Mr. Drawbaugh found them and placed them in. I had the old diaphragm before, with a mass of old diaphragms, and I found it would fit the instrument, and he said it was the one.

Cross-Q. 52. When you made the drawing of April 28th, it was not known whether the diaphragm and electro-magnet of that instrument existed, was it?

A. At that time, and previous to that time, I had heard nothing about it, my instructions being to draw the instruments as they then were.

Adjourned until December 2, 1881, at 10, A. M.

December 2, 1881, 10 *o'clock*, A. M.

Examination resumed pursuant to adjournment.

Present, Mr. Storrow for complainants, and Mr. Hill and Mr. Jacobs for respondents.

Cross-examination of Mr. Knight by Mr. Storrow continued:

Cross-Q. 53. I wish you would compare your fourteenth answer with your fifty-first. Do you mean in your fifty-first answer to refer to your drawing of July 12th or to the drawing of July 22d?

A. In both answers, I referred solely to the drawing of July 12th. I supposed that the drawing of July 22d would be numbered No. 1.

Cross-Q. 54. The instruments "D," "E," "L," "M," "N," "O," "P," "Q," are stated in your drawings to have permanent magnets. Of what material are those magnets?

A. Of steel.

Cross-Q. 55. In the drawing of "J," sheet 2, longitudinal section, the piece E′ was empty when it was brought to you, was it not? And the dotted lines you have put in connection with it were put there for the reasons you have already explained, were they not?

A. It was empty. Whenever carbon balls were wanting, I indicated their position by dotted lines, as I have stated before.

[*Mr. Storrow objects to the drawings marked drawings of reproductions for the reasons that the instruments of which they purport to be drawings have not been put in evidence and most of them have not been produced.*

Mr. Hill states that said reproduced instruments will be put in evidence, and, if Mr. Storrow desires, the witness will be recalled for his further cross-examination upon them hereafter.]

Re-direct by Mr. Hill:

Q. Q. 56. Have you the instrument "A" before you this morning?

A. I have.

Q. Q. 57. Referring now to "Exhibit A drawing," and to the machine "A" in your hands, are the statements contained in said table of references correct, so far as they state the material of the several parts of machine "A"?

A. They are.

Q. Q. 58. What is the material of which the case A, the cover, or cap B, the mouth-piece I, and the thin diaphragm C, are severally made?

A. Of black walnut.

Q. Q. 59. The adjusting screw B′ is of brass, is it not?

A. It is.

Q. Q. 60. What is the small block *b* made of?

A. It is made of brass.

Q. Q. 61. The thin plate attached to the diaphragm on the side next to the screw B′ and marked *c* is of rubber, is it not?

A. It is; it is soft rubber; If it is at all vulcanized, it is very slightly.

Q. Q. 62. Of what material is the armature *d* on the diaphragm?

A. Iron.

Q. Q. 63. Of what material are the bracket F and its adjusting screw G?

A. Of brass.

Q. Q. 64. Of what material are the ends of the spools D of the electro-magnet?

A. Of wood.

Q. Q. 65. Of what material are the connections from the bracket to the electro-magnet, which are marked E, f^2?

A. Of iron.

Q. Q. 66. Of what material are the cases of the electro-magnet?

A. Of soft iron.

Q. Q. 67. In the figures which represent the diaphragm, I observe four notches through the edges. Are those to accommodate the bolts which hold the cap B to the case A?

A. They are. When made they were probably round perforations, afterward becoming broken and jagged as shown.

Q. Q. 68. Is the wire on the electro-magnet, and extending thence to the screw parts H, the ordinary wrapped or insulated electric wire?

A. It is.

Q. Q. 69. Have you the instrument marked "B" now in your hands?

A. I have.

Q. Q. 70. Please compare it with "Exhibit B drawing" and the table of references marked thereon, and state whether said table is correct in its statement of the materials of which the different parts thereof are composed.

A. It is. I find, however, that the plaster-of-Paris lining, shown in the drawing as in tube B, is missing in the instrument.

Q. Q. 71. You were several months in making the drawings which I have put in evidence, were you not?

A. I was; some three months.

Q. Q. 72. You saw the instruments almost every day during that time, did you not?

A. I did.

Q. Q. 73. Were the instruments handled a great deal during last April, May, June, July, and August, in the making of the drawings, carrying the instruments back and forth from their place of deposit to the examiner's office, and in the taking of depositions in the examiner's office?

A. They were handled a great deal of necessity and sometimes were subjected to pretty rough usage.

Q. Q. 74. From your knowledge and experience of the effect of such handling upon delicately adjusted instruments, would you say that it improved them, or the contrary?

A. Most decidedly the contrary.

Q. Q. 75. Referring again to instrument "B," please state whether the wooden block L is or is not made in the form of a bridge, having a recess through its under side to accommodate the tension-plate H.

A. Yes; it is made in such form, having the recess on its lower surface shown in figure marked "Section on line *xx*," lower right hand of "Exhibit B drawing."

Q. Q. 76. Is the tension-plate H attached to the block L or to the base A?

A. It is attached to the base A, by a regulating or adjusting screw, marked I, in the drawing.

Q. Q. 77. Has the screw, marked G, in "Exhibit B drawing," any electric connection with the magnet, or with the instrument, or is it merely a holding screw to secure the electro-magnet in place?

A. It has no electric connection whatever, its purpose being solely to hold the electro-magnet in place, upon the bridge L and to the base A.

Q. Q. 78. State whether the tension-plate H has any electric connection to any part of the instrument.

A. It has not. Its position indicates a mere diaphragm-tightening spring.

Q. Q. 79. Referring again to "Exhibit A drawing," please state whether the screw B′ has any electric connection with the diaphragm.

A. It has not. Its purpose, I should judge, being simply to regulate the diaphragm.

Q. Q. 80. In "Exhibit reproduced B drawing," are the poles of the electro-magnet represented as in contact with the diaphragm or not?

A. They are not in contact.

Q. Q. 81. In that drawing, in the lower figure marked "side elevation," something is seen between the pole of the electro-magnet and the armature. What is that something, and where is it?

A. It is the upper free end of the tension-plate G, and is not between the pole of the magnet and the armature, but bears against said armature, at a point equi-distant from each of the poles. In the figure referred to, the plate G is shown by dotted lines, where it passes through or under the bridge F.

Q. Q. 82. Then, in that figure, you look through between the pole and the armature and see the end of plate G half an inch or thereabouts beyond the pole. Is that the fact? I mean on the further side of the pole.

A. It is the fact; that is the way you see it.

Q. Q. 83. In "Exhibit reproduced B drawing" and in the machine thereby represented, what is the diaphragm composed of?

A. It is made of a piece of bladder.

Q. Q. 84. And what the armature?

A. Of soft iron.

Q. Q. 85. In all the reference tables and notes which you have made on the several drawings that have been put in evidence, are the statements contained in the said several tables and notes correct as to the materials of which the several parts of all the machines were made?

A. They are.

Q. Q. 86. Have you the instrument "F" in your hands?

A. I have.

Q. Q. 87. Please refer to that instrument and to "Exhibit F drawing," and state of what material the upper plate marked E and the lower plate marked D are composed.

A. Of iron coated with tin, commonly known as tin.

Q. Q. 88. What is the material of the rod marked C?

A. Spring brass.

Q. Q. 89. Is that rod, or is it not, in electric contact with the lower plate D?

A. It is.

Q. Q. 90. Projecting up from the upper surface of the plate marked E, I observe a little object marked *e*, and stated in reference table to be wire to plate E. Is that wire in electric contact with plate E or not?

A. It is.

Q. Q. 91. In the "Exhibit reproduced F drawing," and in the instrument thereby represented, is the upper plate E electrically connected to the diaphragm C?

A. It is; by the bar or wire *e*.

Q. Q. 92. Is the carbon G electrically connected to the adjusting rods or posts F?

A. It is; through the metallic plate *d* and wire *d'*.

Q. Q. 93. State whether or not the diaphragm is in contact with either of the rods or posts F.

A. It is not; it has notches on its edges to allow the passage of said posts without contact.

Q. Q. 94. If there is an electric connection from the diaphragm to the posts F, please state what that electric connection is.

A. The only connection possible is through bar or wire *e*, plates E, *d*, carbon G, and wire *d'*.

Recess for dinner.

December 2, 1881, *at* 2 *o'clock*, P. M.

Examination resumed pursuant to adjournment.

Re-direct examination of Mr. Knight by Mr. Hill continued:

Q. Q. 95. Please look at the instrument "C," and at "Exhibit C drawing," and state what the base A of the instrument is made of.

A. Of wood—pine.

Q. Q. 96. And of what is the upright board B made?

A. Of pine wood.

Q. Q. 97. What are the braces C made of?

A. Of wood—black walnut.

Q. Q. 98. What is the body D made of?

A. Of wood—black walnut.

Q. Q. 99. What is the rim E made of?

A. Of wood—black walnut.

Q. Q. 100. What is the diaphragm G made of?

A. Of German silver, I think.

Q. Q. 101. What is the armature H made of?

A. Of soft iron.

Q. Q. 102. What is the band *g* made of?

A. Of iron tinned, commonly known as tin.

Q. Q. 103. Please look at the instrument "C reproduced," in connection with "Exhibit reproduced C drawing," and state whether the parts which are common both to "C" and "reproduced C," are respectively made of the same materials.

A. With the exception of the diaphragm they are; the diaphragm of "C reproduced" being tinned iron.

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Q. Q. 104. The part marked F, in "Exhibit reproduced C drawing" and in the machine thereby represented, is the ordinary electro-magnet, is it not?

A. It is.

Q. Q. 105. And what is the part marked G?

A. A compound permanent magnet.

Q. Q. 106. What are the parts marked E and G′?

A. Wooden blocks to support magnets F and G.

Q. Q. 107. Is the permanent magnet attached to the machine, or simply laid on the blocks?

A. It is not attached. It is laid on the blocks.

Q. Q. 108. Please refer to the instrument "I" and to "Exhibit I drawing," and state what the body A, cap B, mouth-piece B′ and bottom cap C are made of.

A. Of wood; black walnut.

Q. Q. 109. The aperture C′ through the bottom cap C appears in the drawing to be a screw-hole. Is it so in the machine?

A. It is; a female screw.

Q. Q. 110. State whether or not the machine represented in "Exhibit reproduced I drawing, No. 1," which drawing is dated July 12th, 1881, is the identical original instrument "I" with the addition of mechanism placed within it?

A. It is; the wooden case is the same in both. So far as the case is concerned, it is a copy of the drawing of April 28th.

Q. Q. 111. Referring to the mechanism represented in said drawing of July 12th, what are the two diaphragms made of?

A. I think the upper of those diaphragms is of copper, if I remember rightly; the lower, of tinned iron. I will not be positive, however.

Q. Q. 112. Are they in contact, and if not, how are they separated?

A. They are not in contact, being separated by a paper ring marked e^3 in the drawings.

Q. Q. 113. The armature is attached to the lower diaphragm, is it not?

A. It is.

Q. Q. 114. What is the bar *d* made of?

A. It is made of iron.

Q. Q. 115. Can the poles of the electro-magnet be adjusted by the screw *e′*—I mean, can they be moved up and down?

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A. As shown in the instrument and drawings they cannot. That is to say, a piece of paper or other material would have to be placed under the heel-piece *d* in order to raise it, the screw being merely to hold the magnets in place in the box.

Q. Q. 116. Referring now to instrument "I reproduced" and to "Exhibit reproduced I drawing," No. 2, is the case of that instrument made of the same material as the case of the old instrument "I?"

A. It is.

Q. Q. 117. How many diaphragms has it?

A. One.

Q. Q. 118. What is that diaphragm made of?

A. Of iron tinned, commonly known as tin.

Q. Q. 119. How many permanent magnets are there in that instrument?

A. There are two, having their ends joined together. The ends are in actual contact—over-lapped, as shown in the cross-section—the ends being halved together and held to each other and to the electro-magnets by screws passing through the heel-piece and the ends of both magnets into the cores of the electro-magnet.

Q. Q. 120. Please look at the instrument "D" in connection with "Exhibit D drawing," and state what the several parts are made of in the original instrument before you.

A. The body A, cap B, mouth-piece B′, are made of black walnut wood. The diaphragm G is made of iron tinned, commonly known as tin. The flanges of the electro-magnet C are made of brass. The core of the electro-magnet *c* is made of iron and is hollow. The adjustable plug *c′* is made of iron. The adjusting screw F is of brass. The permanent magnet is of steel.

Q. Q. 121. Was there any bottom cap or cover on this instrument?

A. The body A of this instrument is rabbitted for such, but I have never seen such cover.

Q. Q. 122. What is the white patch shown in the front elevation of the drawing?

A. It is merely the effect of light and shadow on the drawing—in shading to bring out the curve of the mouth-piece.

Q. Q. 123. Is the white patch in the front elevation of "Exhibit E drawing" the same?

A. It is.

Q. Q. 124. Please examine the original instrument "E" in connection with "Exhibit E drawing," and state what the several parts are made of.

A. The body A, front cap B, and rear cap C are made of black walnut; the diaphragm D is of iron tinned, commonly known as tin; the side flanges of the electro-magnet E are of brass; the core G is of iron and hollow; the permanent magnet is of steel; the screw-plug G′, to support the magnet, is of iron, and is provided with a female screw H; the rear cap C is provided with an aperture *h* in line with the female screw H.

Q. Q. 125. When you made the drawing of instrument "E," I suppose you found in it no adjustable plug, corresponding to *c′* in "Exhibit D drawing," and no adjusting screw, corresponding to adjusting screw F in "Exhibit D drawing," did you?

A. I did not.

Q. Q. 126. Please examine the original instrument "H" in connection with the drawings marked "Exhibit H drawing, sheet 1," "Exhibit H drawing, sheet 2," and "Exhibit H drawing, sheet 3," and state what materials the several parts of the original machine are made of.

A. The body A, door B, bell-support C′, block G′, to support spring, portion of mouth-piece *b*, and insulator *g′* are of wood; also, the block *e*, through which passes a screw to retain bracket E in place; the bell C is of bell metal; the casting D to support diaphragm is of iron; the diaphragm F, of iron corrugated concentrically; rubber-ring, f; brass wire, f′, to hold diaphragm in place; bracket E, of brass, to support intermediate carbon-holding tube I′, which is of wood; plate D′ of brass to support contact-springs D^2, of brass, provided with carbon-holding cup d^2 of brass; adjusting screw H, brass; diaphragm-adjusting spring G, of iron; induction coil J of the usual construction; contact-spring K′, of brass; push-button K^2, of wood; contact-plate or anvil K, of brass; binding-posts K^3, of brass; plate to hold electro-magnets for bell L^3, of brass; post of same *l* and adjusting nut, of brass; armature M for bell magnets of iron; pivotal plate of armature and pivotal post *m* of brass; clapper-stem of bell, of brass; tension-spring *m′*, for armature M, of brass; cord N, made of cotton or hemp, to increase or diminish the strength or tension of spring *m′*; carbon-holding cup I, attached to diaphragm, is of brass, and is provided with a carbon ball I′; carbon cup d^2 also provided with a carbon ball d^3; between the end of the tension-spring G and the diaphragm is interposed a piece of rubber; the hinges connecting the door to the body of the instrument are, I think, of block tin, or some composition; the screws connecting the various parts are of iron; the strap *j*, holding the induction coil in place, is of brass; the plate D′ is insulated from ring D by a wooden insulator *g*′, and by vulcanite tubes g^3, and at the opposite end by a vulcanite tube or sleeve *h*, through which passes the adjusting screw H; the plate D′ is held or secured to a brass block projecting from the iron ring D by iron screws g^2, which pass through the vulcanite tubes or sleeves g^3 and into said projection.

Q. Q. 127. Is there any electric communication between the carbon-holder I^2 and the plate D′ except through the spring D^2 and the carbons?

A. There is not; the tube projecting outwards through an aperture in said plate, which aperture is at least twice the diameter of said tube and the tube being in the center of said aperture.

Q. Q. 128. In sheet 2 of said drawing, I observe what appear to be two holes through the wooden back of the instrument, one above and the other below the letter A. Am I correct in understanding them to represent holes?

A. Yes, sir; they are holes.

Q. Q. 129. Please examine the instrument "G" in connection with "Exhibit G drawing," and state what materials the several parts of said instrument are respectively composed of.

A. Body A, cap B, carbon-holding tube or cup F, are of wood—black walnut; the diaphragm C is of brass; adjusting-screw J, in rear of instrument, is of brass, and is hollow at its inner end, a rubber block I being placed in such hollow portion, said block projecting slightly beyond the end of the screw; the female screw through which the adjusting screw passes is of wood; the binding posts are of brass, one of said binding posts being connected by ordinary conducting wire to a contact plate or tip G′ at bottom of tube F; the other binding post is connected by a conducting wire to a short stud projecting from a contact plate G, which contact plate is placed within the mouth of the tube, and bears against the carbon balls or blocks within the tube F. The stem of the contact plate G at its outer end bears or impinges against a small contact cup *c* of brass, which is secured to the diaphragm. The contact plate G is of copper, coated with what appears to be platinum, upon its inner surface. The stem of said plate is of brass; paper ring D is placed between the diaphragm and the cover. The contact plate or tip G′ is of the same material as the plate or tip G.

Q. Q. 130. Please examine the original machine "O" in connection with "Exhibit O drawing," and state what materials the several parts of said machine are respectively composed of.

A. The body A, cap B, are of wood, as is also the ring G, in interior of the instrument. The adjusting screw I, in rear of instrument, is of brass, the front portion being hollow, and containing a brass spiral spring H′, which bears against the carbon-holding cup F, of brass, which cup contains a carbon ball *f*, and which cup is connected to one of the binding posts K, by an ordinary conducting wire.

The diaphragm C is of brass, and to its center is secured a carbon-holding cup *c*, of brass, containing a carbon ball *c′*. The diaphragm is connected to the remaining binding post by an ordinary conducting wire, the end of which wire is soldered to the diaphragm.

Q. Q. 131. I observe that the lower side of the longitudinal section in the drawing appears to have a recess, which is not shown at the upper side, and which seems to render the wall very thin at that part. Am I correct about that?

A. Yes, sir; it is so recessed.

Q. Q. 132. Do you remember how wide that recess is?

A. I think it was about three eighths of an inch wide, at its top.

Q. Q. 133. In this instrument, is not the cap B made with a slight annular concave between the opening of the mouth-piece and outer edge of the diaphragm?

A. It is.

Q. Q. 134. There is noted in the reference table of the drawing a card-board ring D; where was that placed in the machine?

A. Between the diaphragm and the cap, around the outer edges of the diaphragm. Its position is shown in the drawings.

Q. Q. 135. Please examine the instrument K, in connection with "Exhibit K drawing," and state of what materials the several parts of the original instrument are respectively composed.

A. Body A, front cap B, and rear cap C, friction roll H, and blocks F′, are of wood; the front diaphragm D, is of brass. The rear diaphragm is of iron coated with tin, commonly known as tin. The electro-magnets G are ordinary electro-magnets wound on wooden bobbins, and are connected to curved horse-shoe permanent magnets of steel F, which permanent magnets are held in place within the case or body of the instrument, by common wood-screws K, of brass, which pass through the side of the case between the legs of the permanent magnets

F, and into the wooden blocks F′. The permanent magnets are two in number, over-lapping at the poles, being halved together, and are secured to the electro-magnets by screws, which pass through such over-lapping portion into the cores of the electro-magnets. The armature E, of the electro-magnets, is of iron, the ends being connected to the upper and lower diaphragm, respectively, by brass plates, so that the armature stands perpendicular to the diaphragms. To the outer side of the armature is secured a brass plate E′, against which plate the friction roll H bears. The friction roll H is mounted upon a shaft *h*, of brass, which shaft projects through the side of the casing. The electro-magnets are connected to brass screw-cups arranged at opposite sides of the case.

Adjourned until December 3d, 1881, at 10 o'clock, A. M.

December 3d, 1881, 10 *o'clock*, A. M.

Examination resumed pursuant to adjournment.

Present, Mr. Hill and Mr. Jacobs for respondents and Mr. Storrow for complainants.

Re-direct examination of W. H. H. Knight by Mr. Hill continued:

Q. Q. 136. Please examine original instrument marked "L," in connection with "Exhibit L drawing," and state of what materials the parts of the original instrument are respectively composed.

A. The body A, cap B, and wedges or blocks E′, are of wood; the wedges of pine, cap and body of black walnut. The instrument has a compound diaphragm consisting of two members, the one nearest the cap being made of copper; the other, of iron; the diaphragms are held together by a copper rivet *c*, through the center. A paper ring is interposed between the diaphragms at the outer edges. shown by the dotted lines. The upper diaphragm is perforated by four round holes, marked C^2. Two permanent horse-shoe magnets E, the poles of which are halved and over-lapped and are held together by screws which pass through said over-lapped portions, and into the cores of the electro-magnets D. The electro-magnets D are connected by ordinary conducting wires to binding posts F, arranged at opposite sides of the case or body. The permanent magnets are held in place, in the case or body, by wooden wedges E′, which are inserted between said magnets and the inside wall of the case. The inner surface of the cap B is provided with a recess, in which is placed a steel spring *b*, said spring being secured to the cap at its outer edge, near the flange of the said cap, by a rivet b^2. The opposite end of the spring extends to the center of the cap, terminating in the center of the mouth-piece aperture, where it is provided upon its outer surface, with a small circular block of brass *b′*, secured to said spring by a brass rivet. The spring *b* is regulated by an adjusting screw G, which passes through the cap and bears against the spring near its center, as shown in the drawing. This screw is an ordinary wood-screw.

Q. Q. 137. Please compare "reproduced L instrument" with "reproduced L drawing," and state the materials of which the several parts of the instrument are respectively composed.

A. The body A and cap B are of wood—black walnut; the wedges or blocks *f* are of pine wood; the carbon-holding tube G is of wood—maple, I think.

The instrument is provided with two curved, permanent horse-shoe magnets F, the poles of which are halved together over-lapping, and are secured or held together by screws *j′*, which pass through said over-lapped portions and into the cores of electro-magnets E.

The electro-magnets are connected by ordinary conducting wire at one side, to one of the binding posts, and at the other side to a metal plate, placed or attached to the inside bottom surface of the carbon-holding tube G.

Carbon balls *g* are placed in this tube, bearing upon said plate.

Upon the top of the carbon balls and within the tube, bears or rests a contact plate of copper, having an outwardly projecting stem of brass.

From this stem to the remaining binding post, extends an ordinary conducting wire.

An adjusting screw *h*, of brass, passes through the rear of the case or body, the forward portion of which screw is hollow and is provided with a rubber plug *h′*, which projects slightly beyond the end of the screw and bears against the lower end of the tube G.

The instrument is provided with a compound diaphragm D, consisting of two members held together at their centers by a brass rivet d^3. The outer diaphragm *d*, nearer the cap, is of copper, and is provided with four circular perforations.

The inner diaphragm *d′* is of iron. To the inner surface of the diaphragm *d′* is attached an armature *e*, of soft iron, which armature is held to the diaphragms by the same rivet that secures them together.

The armature is held at a slight distance from the diaphragm by a copper washer, which surrounds the rivet between the armature and the diaphragm. The end of this rivet d^3, below the armature, is slightly hollowed out.

The outer end of the stem of the upper contact plate in the tube G bears against the concave end of this rivet.

The inner surface of the cap B is provided, at one side, with a recess in which is placed a steel spring I, held or secured to the cap nearest its outer edge by a brass rivet; the opposite end of the spring extends to the central aperture in the cap, and is provided, upon its outer surface, with a small, thin, circular block *i*, of brass, attached to the spring by a brass rivet.

The spring I is regulated or adjusted by a screw *i'*, which passes through the cap, which screw is a common wood-screw of brass.

A paper ring d^2 is interposed between the diaphragms *v* surrounding said diaphragms at the edges.

A paper ring *j* is interposed between the upper diaphragm *d* and the cap B.

The tube G is held and guided within and by a tin tube H, which extends from the rear inner wall of the instrument to the outer ends of the electro-magnets, a slot being provided at one side of the tube H to allow passage for the conducting wire, the tube G being adjusted up or down in the tube H by the adjusting screw *h*.

Q. Q. 138. Please examine original instrument "M" in connection with "Exhibit M drawing," and state the material of which the several parts of the instrument are respectively composed.

A. The body A and cap B are of wood—black walnut. The instrument is provided with two curved, permanent horse-shoe magnets E, held within the case by screws *g'*. The poles of the magnets E are halved and over-lapped, such overlapping portions being held together and to the cores of the electro-magnets D by screws *e*.

Pieces of paper are interposed between the permanent magnets and the rear inner wall of the instrument. The rear wall of the instrument is perforated and is provided with a female screw-block or nut *g*, of brass, through which extends a brass post F.

The post F is provided at the part where it passes through the screw-block *g* with a male screw, which fits said female screw. The post F extends inwardly nearly to the diaphragm, between the electro-magnets and in line with their respective cores. The inner end of post F is hollowed out, said hollow portion being screw-threaded—a female screw. The diaphragm C is of iron, and bears or rests upon a rubber ring G, placed in a recess surrounding the inner wall of the case. The electro-magnets are connected by ordinary conducting wires to binding-posts *d*.

Q. Q. 139. Please examine reproduced instrument "M" in connection with "Exhibit reproduced M drawing," and state of what materials the several parts of the instrument are respectively composed.

A. The body A and cap B are of wood—black walnut. The instrument is provided with electro-magnets D, the heel-plate of which is secured to the rear inner wall of the instrument by screws, said heel-piece being provided at its center with an aperture.

An adjusting screw G, of brass, passes through the rear wall, at the center thereof, the stem of which screw is hollowed out, and is provided with a rubber block *g*, which projects slightly beyond the inner end of the screw.

The inner end of this rubber block bears against the lower end of a wooden carbon-holding tube E, placed between the electro-magnets in line with their respective cores.

The carbon-holding tube extends nearly to the outer end of the electro-magnets, and is provided, upon its lower inner surface, with a copper contact-plate *e'*; carbon balls *e* rest upon this plate within the tube, upon the upper of which rests or bears a contact-plate e^2, of copper, which plate is provided with an outwardly projecting stem of brass, the upper end of which bears against the concave end of the brass rivet securing the iron armature I to the diaphragm.

A thin copper washer is interposed between the armature and diaphragm. The diaphragm C is of tinned iron, commonly known as tin, and is connected to the armature at its center.

The instrument is provided with two binding-posts of brass, H, arranged at opposite sides thereof, to one of which one of the electro-magnets is connected by ordinary conducting wire. The remaining electro-magnet is connected by ordinary conducting wire to the lower contact-plate *e'* within the tube E.

The remaining binding post is connected by ordinary wire to the stem of the upper contact-plate e^2.

A paper ring is interposed between the diaphragm and cap.

The adjusting screw G moves through the aperture in the bell-piece or plate, to adjust the carbon-holding tube nearer to or farther from the armature of the diaphragm, as desired. The tube E is held and guided by tinned iron brackets *f*, between which the tube loosely slides. The brackets are secured to the heel-piece by the screws that fasten said heel-piece to the wall of the instrument.

Q. Q. 140. Please examine instrument "P" in connection with "Exhibit P drawing," and state the materials of which the several parts of the original instrument are respectively composed.

A. The back or base board A, block B for holding diaphragms, block E′ for holding induction coils, caps C, C′ of receiver and transmitter, mouth-piece D of transmitter and ear piece G of receiver, are of wood—black walnut.

The block B is held to the back or base board A by common wood-screws.

The rear surface of the block is recessed for a permanent horse-shoe magnet, such recess being shown at I in the drawings. At one end of this recess is a circular aperture I′. The rear surface of the block B is also provided with a recess, which extends from or about the middle of the lower edge, upward diagonally to a point at the heel end of recess I. The opposite or front surface of block B is provided with circular recesses M, as shown in the figure at lower right-hand corner of sheet 2.

Recess for dinner until 2 o'clock, P. M.

December 3, 1881, 2 *o'clock*, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Re-direct examination of W. H. H. Knight by Mr. Hill continued:

The recess M at right of lower right-hand figure is made to accommodate the diaphragm of the receiver, and the perforation I′ opens into said circular recess at the center thereof, it being a hole that goes entirely through the block. A portion of this recess M is somewhat deeper than the remaining part, such deeper portion forming a groove around the outer portion of the recess.

From this groove, at the upper portion of the block B, extends a perforation, which perforation passes through the block and to the upper leg of the recess I upon the back of said block.

The remaining circular recess M is provided with a similar groove at its outer edge, in which groove is placed a strip of soft rubber N, which extends nearly around the said groove, being held in place in said groove by small rubber blocks, as shown at lower right-hand corner of sheet 2, of the drawings.

The central portion of the latter circular recess "M" is somewhat deeper than the remaining portion of the recess, such deeper portion extending nearly to the back of block B, and into this deeper portion the diagonal recess upon the back of block B extends the terminal point of said diagonal recess being at the center of the deeper portion of recess M.

Upon the back of the block B and in the diagonal recess is pivoted a brass spring H′, the pivotal point of which spring is shown at h^2, at the upper right-hand corner of sheet 2. The spring H′ extends from the lower edge of the block to and enters the deeper portion of the recess M at its center. At this point a carbon-holding cup *h*, of brass, is secured to the spring by a brass rivet, said cup containing a carbon ball. The cup and ball project into the deeper portion of the circular recess M. Upon the inner rear wall of said deeper portion and above the carbon-holding cup of the spring, is secured a small wooden block, from which projects a small wooden post or stud. Upon this stud is hung a carbon block O, the outer surface of which impinges against a carbon ball held within a brass cup, attached by a brass rivet to the diaphragm of the transmitter.

This diaphragm is of tinned iron, commonly known as tin, and to its outer edge is secured by solder a copper wire, which passes through an aperture in the block rearwardly. The cap of the transmitter is provided upon its inner surface with a slight flange, which bears upon the outer edges of the diaphragm.

An aperture is made through the center of this cap, through which aperture projects outwardly a short copper tube, to the outer end of which is secured the wooden mouth-piece D; this cap is lettered upon the drawing C′, and is held in place by common wood-screws.

The remaining cap C is similar in form to cap C′, having a similar aperture at its center, and short outwardly projecting copper tube, into which, at its outer end, is inserted one end of a rubber tube F, through which tube extends from end to end an ordinary spiral spring, of brass, which spring projects into or through the copper tube upon the cap C; the opposite end of the rubber tube F is inserted into a copper tube extending from the rear surface of the ear-piece G.

The ear-piece G is made in two parts, to wit: A circular disc, forming the base and holding the tube, and a circular recessed and perforated piece forming the front portion of said ear-piece. The circular disc or base fits into the circular recess in the perforated front piece, and holds in place a small mica diaphragm in said circular recess.

Between the mica diaphragm and the circular disc is interposed a soft rubber ring, said ring surrounding the diaphragm at the outer edge thereof. Between the mica diaphragm and the lower surface of the circular recess is interposed a thin paper ring surrounding the outer edge of the diaphragm.

One end of the spiral spring presses lightly against this diaphragm.

The outer part or front of the ear-piece G is provided with a cup-shaped recess, from the base of which extends, to and into the circular recess, the perforation referred to.

Through the block B, between the caps C, C′ and nearly in line with their centers, (as shown on sheet 1 of the drawings), extends a perforation, which perforation passes to and into the recess I, upon the back of said block.

There is also an adjusting screw E, of brass, the stem of which passes through the block and impinges against the lower end of spring H′.

To the rear surface of the spring H′ is secured or attached by solder, one end of an ordinary conducting wire *h*′, which wire passes rearwardly through a perforation in the base-board A.

The block E′ is provided with circular recesses J, which recesses open upon the back of the base-board. These recesses are made for the purpose of containing or holding induction coils, one of which is shown in the drawing at K; *k* represents a wedge for holding said coil in place. H represents ordinary conducting wires, which extend from point to point in grooves made upon the back of the instrument. L represents apertures made through the base-board A for conducting wires.

The diaphragm of the transmitter was in the instrument, the diaphragm of the receiver was not when I made the drawings.

The carbon block O was also in the instrument. A portion of said block was broken off as indicated in the drawings. The above instrument will perhaps be better understood by reference to the reproduced instrument and the drawing thereof. I forgot to mention that in instrument "P" there is, upon the front side of the base-board A, between said base-board and block B, and opposite the spring H′, a recess not shown in the drawings. In this recess is placed a spring, of brass, one end of which is secured to the base-board A, the opposite end of which spring bears against the rear surface of spring H′, between the point at which the conducting wire is attached to said spring and its outer end. Such spring operates to keep the end of spring H′, bearing carbon cup *h* away from the other carbons contained in the circular recess. The spring mentioned is not shown in the drawings, but impinges against spring H′ at a point opposite, or nearly opposite, the adjusting-screw E, pressing the spring H′at all times against the point of the adjusting screw.

Q. Q. 141. Please examine "reproduced instrument P" in connection with "Exhibit reproduced P drawing," and state of what materials the several parts of the original instrument are respectively composed.

A. Back or base-board A, block holding diaphragms B, caps C D of transmitter and receiver, mouth-piece C′ of the transmitter and block L, for holding induction coils, are of wood—black walnut.

The blocks B and L are secured to the base-board A by ordinary wood-screws of iron.

In the rear surface of block B is a recess K^2, in which recess is placed a permanent steel horse-shoe magnet I′, to one of the poles of which is attached, by an iron screw, an electro-magnet, I, which electro-magnet extends through an aperture in the block B. To the remaining pole of the permanent magnet is secured, by a screw, a post J, which appears to be of steel. This post also extends through block B, through an aperture near its upper edge.

The permanent magnet I′ is compound, consisting of two members held together by brass rivets.

The magnet is held in place in the recess by a common wood-screw *i*, which passes through the upper leg of said magnet and into the block B.

There is also another recess upon the rear surface of block B, which recess extends diagonally upward from a point near the middle of the lower edge of block B, to a point at the heel of the recess K^2.

In this diagonal recess is placed a brass spring G′, pivoted to the block at the point *g*′, and provided, upon its rear surface, with a conducting wire G^3, which wire is soldered to the spring G′ at one end.

The upper end of the spring G′ passes under the horse-shoe magnet, and is provided at its end with a brass carbon-holding cup G^2, in which is secured a carbon ball G^4.

Said carbon cup and ball project inwardly into a circular recess F, shown in the drawings, [sheet 2.]

The front side of the block B is provided at each end with circular recesses for the accommodation of the diaphragms of the transmitter and receiver respectively.

The recess shown at the right of "front view" [sheet 2] is provided with an annular groove at its outer edge, somewhat deeper than the remaining portion of the recess, in which groove is placed a rubber ring H′, held in place by small wooden blocks *h*.

The electro-magnet I, attached to the lower pole of the permanent magnet I′, extends to and into the circular recess near the center thereof.

The post J, attached to the upper pole of the permanent magnet I′, extends to and into this recess at its upper portion, said post being provided at this point with a female screw, into which fits a corresponding male screw, of iron, that passes through the diaphragm near its outer edge, securing said diaphragm H to the post.

The diaphragm H of receiver is of tinned iron, commonly called tin, and bears at its inside edges upon the rubber ring H′.

The outer end of the pole of electro-magnet I terminates a slight distance from the inner surface of the diaphragm H, and at the center thereof.

The circular recess F, for the accommodation of the transmitting diaphragm, is provided at its outer edges with a groove in which is placed a rubber ring G, that extends nearly around said recess.

Adjourned until Monday, December 5th, 1881, at 10 oclock, A. M.

Monday, December 5th, 1881.

Examination resumed pursuant to adjournment.

Present Mr. Storrow for complainants, and Mr. Hill for respondents.

Re-direct examination of Mr. Knight by Mr. Hill continued:

[*Answer resumed.*]

In the circular recess F, directly above the carbon-holding cup g^2, secured to the rear inside wall of said recess, is a small wooden block, provided at its lower end with a wooden post or stud *f*′, upon which is hung a cardon block *f*, against the rear surface of which block the carbon ball G^4, attached to the spring G′, impinges.

The opposite side of the block *f* impinges against a carbon ball *e*′, placed in a carbon-holding cup *e*, of brass, secured to the diaphragm by a brass rivet, said cup and carbon ball being shown in position upon the diaphragm in sheet 3 of drawings. I did not think it necessary to show the diaphragms in the sectional views in sheet 2.

This diaphragm E is of tinned iron, commonly known as tin, and is provided at its lower outer edge with an ordinary conducting wire g^2, which wire is attached to the diaphragm at one end by solder, and which wire passes rearwardly through the block B and base A of the machine.

The carbon-holding end of spring G′ and carbon block *f* are adjusted nearer to or farther from the diaphragm by an adjusting-screw K′, of brass, the stem of which passes through block B, near its lower edge, and impinges against one side of the spring G′ at its lower end.

The spring G′ is kept pressed against the point of the adjusting-screw K′ by an ordinary leaf spring of brass, held at one end to its base A in a recess upon said base or back, between the block B and the recess, and at the lower edge of said block. The outer end of this spring bears against the spring G′, upon the side opposite to that impinged upon by the adjusting-screw, and at a point directly opposite the end of said screw, its purpose, as above stated, being to keep the end of the spring G′ at all times pressed against the point of the adjusting-screw.

An adjusting screw K, of brass, passes through the block B from front to rear, the point of which screw bears against the lower leg of the permanent magnet I′, for the purpose of adjusting the electro-magnet I, secured to the pole of said lower leg, nearer to or farther from the diaphragm H of the receiver.

This diaphragm H is of tinned iron, commonly known as tin, and is secured at its upper edge to the post J, (the other end of which is connected to the upper leg of the permanent magnet I′,) by a common iron machine screw.

The cap C of the transmitter is of black walnut, and is provided upon its inner surface with a slight flange, which bears upon the outer edges of diaphragm E, when said diaphragm is in place in the instrument.

The cap C is provided at its center with an aperture, from the inner edge of which projects outwardly a brass tube C^2, about one and one half inches in length.

To the outer end of this tube is secured a wooden mouth-piece C', the outer surface of which mouth-piece has a cup-shaped recess, and which mouth-piece is also perforated at its center.

The cap D of the receiver is of black walnut and is provided upon its inner surface with a flange, similar to the flange of cap C, and which bears upon the outer edge of diaphragm H of the receiver.

The cap D is also provided at its center with an aperture, through which projects, from the inner surface of said cap, and outwardly, a brass tube D', about one inch and a half in length, in the outer end of which tube is inserted a rubber tube D^2. The outer end of this tube is inserted in one end of a brass tube connected at its opposite end to a wooden ear-piece.

This ear-piece is not shown in the drawing, but is similar in all respects to the ear-piece shown and described in connection with instrument P, having a mica diaphragm, rubber and paper rings, cup-shaped recess for the ear, etc.

In this instrument, as in the original instrument P, a spiral spring D^3, of brass, extends from end to end of tube D^2 inside of said tube, the ends of which spring bear upon the respective diaphragms of the ear-piece and receiver.

The block L, for holding induction coils, is of black walnut, secured to the base-plate A by ordinary wood-screws.

This block is provided with circular recesses L', which open through the back of the plate A.

The recesses L' are made for the purpose of holding induction coils L^2, which are common induction coils, and are held in place in said recesses by wooden wedges l.

Apertures l^5 are provided, through the base-plate A, for the passage of conducting wires l' from point to point, which wires are held in grooves made upon the back of base-plate A by pieces of paper l^2, pasted over said grooves and wires.

The screws marked l^3, l^4, are common wood-screws, and hold in place the blocks B and L upon the face of base A.

Upon the face of base A, between base A and block B, and opposite the permanent magnet upon the block, is a recess to accommodate the permanent magnet.

The instrument is evidently intended to be used with the base-plate

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A in a vertical position, and I have so described it. The base-plate A has a perforation near its upper end, by means of which it may be hung upon or secured to a wall.

Near the right edge of base-plate A is a perforation for the accommodation of a switch, as I have been told by Mr. Drawbaugh.

The spring D^3 in "Exhibit reproduced P drawing, sheet 1," shown in the rubber tube of "Reproduced P," is drawn from the spring in the rubber tube attached to original instrument "P." In making "Exhibit P drawing," I intended to have shown the tube cut open, in order to exhibit the spring, but inadvertently omitted to do so.

While I was making "Reproduced P drawing," I noticed this omission, and, as Mr. Drawbaugh informed me that the rubber tube and spring to be attached to the "Reproduced P" would be precisely similar to the spring and tube attached to original instrument "P," I thought such spring need only be shown in the drawings of the reproduced instrument, and therefore did not correct the drawings of the original instrument in that respect. The tube now on the reproduced instrument has no spring in it.

Q. Q. 142. On comparing the original instrument "P" with the "Reproduced instrument P," I observed that the former has evidently been, accidentally or otherwise, deprived of a few parts shown in the latter. Will you please explain what these parts are, and whether the original instrument, so far as you can judge from its construction and present appearance, contained them at some former time?

A. "Reproduced instrument P" is provided with a permanent magnet and also with an electro-magnet and with post J, which are all wanting in the original instrument, but for which places are provided in the original instrument.

The original instrument "P" also lacks the diaphragm of receiver and rubber ring upon which said diaphragm rests, said diaphragm and ring being attached to instrument "Reproduced P."

The original instrument, however, is provided with places for the reception of said missing parts.

The adjusting-screw for the permanent magnet, shown in "Reproduced P drawing," and lettered K, is missing from original instrument "P," in which latter instrument, however, an aperture is provided for the passage of such a screw.

The pivoted carbon block, shown in "Reproduced P drawing," and marked *f*, is at this time wanting in original instrument P, but when I made the drawings of the original instrument, a portion of this block was in place in the instrument, in the position shown at lower right-hand corner of sheet 2 of "Exhibit P drawing," and lettered O in said drawing.

The recess contained in the base A of reproduced instrument P, for the accommodation of the permanent magnet, is not shown or contained in the original instrument. Its place is supplied by depressions or cut away portions in said base A.

The reproduced instrument is provided with two induction coils. The original instrument has one.

There are also fewer conducting wires in the original than in the reproduced instrument. The rubber tube upon the reproduced instrument lacks the spiral spring contained in the corresponding tube of the original, and said tube is a little over half as long as the tube of the original pin.

Q. Q. 143 Was the pivoted carbon block of original and reproduced instrument "P" capable of a free sliding movement lengthwise of its supporting pin?

A. It was, the aperture through said block being somewhat larger than the diameter of said pin, as indicated by the dark space surrounding said pin, in the drawings of the original instrument, sheet 2.

Q. Q. 144. Then, in consequence of that large aperture, said carbon block was not only capable of swinging on said pin as its axis, but also capable of a slight rocking movement on an imaginary axis transverse to the pin. Was it?

A. It was capable of both such motions or movements.

Recess until 2 o'clock, P. M., for dinner.

December 5, 1881, 2 *o'clock*, P. M.

Examination resumed pursuant to adjournment.

Present same counsel, with the addition of Mr. Jacobs for respondents.

Re-direct examination of Mr. W. H. H. Knight by Mr. Hill continued:

Q. Q. 145. Please examine instrument "Q" in connection with "Exhibit Q drawing," and state the materials of which the several parts of the original instrument are respectively composed.

A. The body A, cap B, movable mouth-piece B′ and rear cap C are of wood—black walnut.

The mouth-piece B′ is provided with a shoulder that bears upon the face of the cap B, and with a projecting portion that fits closely into a circular aperture made through said cap.

The mouth-piece B′ is provided with a cup-shaped recess upon its front side, and an aperture through said mouth-piece at the base of said recess.

The body A has recesses in its front and rear surfaces; one of which—the front—has the outer portion of its surface deeper than the remaining portion, said deeper portion forming a groove around said recess, as shown in the drawings at the upper right-hand corner.

In this deeper portion is placed a ring of soft rubber, the upper edge of which projects upward beyond the surface of said recess and forms a rest for the diaphragm D.

The diaphragm is of iron and is partially divided and provided at its center with a circular aperture, as shown in the drawings at lower right-hand corner.

The recess in rear side of body A is uniform in depth.

In this recess are placed two compound permanent horse-shoe magnets G, the poles of which over-lap (north to north and south to south) and are held together and to electro-magnets F by iron screws that pass through the over-lapped portions and into the cores of the electro-magnets.

The permanent magnets are held in position in the recess by common wood-screws.

The electro-magnets project through perforations in the body A, their poles nearly touching the under surface of the diaphragm.

The electro-magnets are connected by ordinary conducting wires with two small binding posts I, of brass, arranged at one side of the instrument, within the rear recess.

Through the flange of the instrument, opposite the binding-posts, are provided apertures through which pass ordinary conducting wires.

Pieces of paper *g* are laid over the conducting wires in the recess between said conducting wires and the permanent magnet.

The rear cap C is perforated at its center.

Q. Q. 146. Please examine instrument "N" in connection with "Exhibit N drawing," and state the materials of which the several parts of the original instrument are respectively composed.

made the drawings of the original instrument, a portion of this block was in place in the instrument, in the position shown at lower right-hand corner of sheet 2 of "Exhibit P drawing," and lettered O in said drawing.

The recess contained in the base A of reproduced instrument P, for the accommodation of the permanent magnet, is not shown or contained in the original instrument. Its place is supplied by depressions or cut away portions in said base A.

The reproduced instrument is provided with two induction coils. The original instrument has one.

There are also fewer conducting wires in the original than in the reproduced instrument. The rubber tube upon the reproduced instrument lacks the spiral spring contained in the corresponding tube of the original, and said tube is a little over half as long as the tube of the original pin.

Q. Q. 143 Was the pivoted carbon block of original and reproduced instrument "P" capable of a free sliding movement lengthwise of its supporting pin?

A. It was, the aperture through said block being somewhat larger than the diameter of said pin, as indicated by the dark space surrounding said pin, in the drawings of the original instrument, sheet 2.

Q. Q. 144. Then, in consequence of that large aperture, said carbon block was not only capable of swinging on said pin as its axis, but also capable of a slight rocking movement on an imaginary axis transverse to the pin. Was it?

A. It was capable of both such motions or movements.

Recess until 2 o'clock, P. M., for dinner.

December 5, 1881, 2 *o'clock*, P. M.

Examination resumed pursuant to adjournment.

Present same counsel, with the addition of Mr. Jacobs for respondents.

Re-direct examination of Mr. W. H. H. Knight by Mr. Hill continued:

Q. Q. 145. Please examine instrument "Q" in connection with "Exhibit Q drawing," and state the materials of which the several parts of the original instrument are respectively composed.

A. The body A, cap B, movable mouth-piece B′ and rear cap C are of wood—black walnut.

The mouth-piece B′ is provided with a shoulder that bears upon the face of the cap B, and with a projecting portion that fits closely into a circular aperture made through said cap.

The mouth-piece B′ is provided with a cup-shaped recess upon its front side, and an aperture through said mouth-piece at the base of said recess.

The body A has recesses in its front and rear surfaces; one of which—the front—has the outer portion of its surface deeper than the remaining portion, said deeper portion forming a groove around said recess, as shown in the drawings at the upper right-hand corner.

In this deeper portion is placed a ring of soft rubber, the upper edge of which projects upward beyond the surface of said recess and forms a rest for the diaphragm D.

The diaphragm is of iron and is partially divided and provided at its center with a circular aperture, as shown in the drawings at lower right-hand corner.

The recess in rear side of body A is uniform in depth.

In this recess are placed two compound permanent horse-shoe magnets G, the poles of which over-lap (north to north and south to south) and are held together and to electro-magnets F by iron screws that pass through the over-lapped portions and into the cores of the electro-magnets.

The permanent magnets are held in position in the recess by common wood-screws.

The electro-magnets project through perforations in the body A, their poles nearly touching the under surface of the diaphragm.

The electro-magnets are connected by ordinary conducting wires with two small binding posts I, of brass, arranged at one side of the instrument, within the rear recess.

Through the flange of the instrument, opposite the binding-posts, are provided apertures through which pass ordinary conducting wires.

Pieces of paper *g* are laid over the conducting wires in the recess between said conducting wires and the permanent magnet.

The rear cap C is perforated at its center.

Q. Q. 146. Please examine instrument "N" in connection with "Exhibit N drawing," and state the materials of which the several parts of the original instrument are respectively composed.

A. The body A, front cap B, rear cap C, and disc M, are of wood—black walnut.

The front portion of body A has a circular recess in it. The outer edges of said recess are slightly deeper than the remaining position, as shown in front view of body of instrument.

In this deeper portion rests a rubber ring F, inclosing a plaster-of-Paris disc F, said disc being cracked, as shown in front elevation of body.

A paper ring I is laid upon the upper surface of the rubber ring, upon which ring I rests a two-part diaphragm of steel G—two semicircles. A paper ring H is laid upon and surrounds the outer edge of this diaphragm, and upon this latter ring is laid a wooden disc M, the center of which is perforated, and which has also upon its front surface a slight recess that extends from its outer edge to such perforation.

The rear portion of the body A of the instrument is provided with a circular recess, the central portion of which is somewhat deeper than the remaining part of said recess. A portion of the flange surrounding this recess is broken away, as indicated by the drawings.

In this recess, and secured to the body of the instrument by common iron screws, are placed two compound permanent horse-shoe magnets E, the poles of which over-lap [north to north and south to south] and are held together and to electro-magnets D by common iron screws, that pass through said over-lapped portions and into the cores of the electro-magnets. The magnets D pass through perforations in the body A and plaster-of-Paris disc F, the poles of said magnets nearly touching the steel diaphragm.

The electro-magnets are connected by ordinary conducting wires, with small brass binding posts O, arranged at each side of the instrument, within the rear recess.

These binding posts are provided with conducting wires K, that pass outwardly through the flange surrounding said recess.

Pieces of paper are laid between the permanent magnets and conducting wires, as shown in the drawings.

The inside of the cap B is provided with a recess extending from one edge of said cap to a perforation made in its center, in which recess is laid a brass spring L, the outer end of which spring is secured to the cap by a brass rivet.

The inner end of the spring, opposite the aperture, is provided with a small circular brass block, held to the spring by an iron screw.

This block is upon the inner surface of the spring, and passes through the aperture in the wooden disc M, to the diaphragm. Through the cap B passes an adjusting-screw *l* of iron, the point of which impinges upon or against the spring L.

The cap B is held in position upon the instrument by common wood-screws of brass.

The rear cap C is perforated at its center, over which perforation, at the time the drawings were made, was pasted a piece of paper *c*.

The conductors K referred to are flexible cords, consisting of a number of fine wires covered with braided silk. One of these is green and the other red. They have conducting tips of copper wire.

Q. Q. 147. Please examine instrument "J" in connection with "Exhibit J drawing," and state the materials of which the several parts of the original instrument are respectively composed.

A. The body of the box A, door B, mouth-piece B^1, B^2, disc B^3, are of wood—black walnut. The back of the box is of pine wood. The mouth-piece is made of two pieces, one of which B^2 fits into a perforation in the door, with the sides of which it is flush. The other, at the time the drawings were made, was glued to the outside surface of the door surrounding this aperture.

To the inner surface of the door B is secured, by common wood-screws, *c*, an iron casting C. This casting is nearly an ellipsoidal ring, being in the shape of two half circles, drawn apart, with the ends being continued in straight lines until they meet. The upper part of this casting is provided with an upward and outward projection, which projection is cast with the ring C, and projects inward, into the body of the box, when the door is closed.

The lower part of the ring C is also provided with a projecting portion, perforated and provided with female screws.

This ring is rabbitted on its inside so as to leave a flange C' next to the door, upon which flange rests the diaphragm G, of iron or steel. Between said diaphragm and the door, within the space inclosed by the flange C', is a wooden disc B^3 secured to the door by brads. This disc is a re-inforcement of the door and is covered with shellac. It has no vibrating function, but is held rigid against the door, the mouth-piece opening through it.

Diaphragm G is surrounded at its edges with a piece of paper *g*, said paper strip being interposed between the diaphragm and the flange C' of the casting C, and also between the diaphragm and a ring of brass wire F which rests upon the edges of the diaphragm, opposite the flange, and serves to hold the diaphragm in place upon said flange, being itself held in place by iron machine screws *f*, which pass into the casting C.

Near the center of the diaphragm, upon its inner side, furthest from the mouth-piece, are secured two carbon-holding cups of brass, O, O^2, one of which O is attached directly to the diaphragm by a brass rivet, the other O^2 being attached by a copper rivet to an insulating plate O' of vulcanite or hard rubber, said insulating plate being in turn secured to the diaphragm by four small copper rivets.

Each of the carbon-holding cups, O and O^2, contains a carbon ball, marked o, o' respectively.

From the insulated carbon-holding cup O^2 extends a conducting wire.

To the diaphragm below said cup is also soldered a conducting wire at P.

Attached by screws d^2 to the upper outward and upward projecting portion of casting C are two brass plates D, which are insulated from the projection on the casting by an interposed thin piece of wood D^2, and are further insulated from the screws d^2 by vulcanite sleeves; said sleeves being shown in right-hand figure of sheet 2, between the screw-head and the plate.

Attached to the plates D by iron screws d' are two leaf springs D', to the lower free ends of which, upon the side nearest the diaphragm, are attached by iron screws d^4, brass carbon-holding cups d^5, containing carbon balls d^6.

The plates D are curved laterally, to allow spaces D° through which the carbon-holding cups d^5 project.

The lower ends of the plates D are perforated, and provided with brass adjusting screws d, the stems of which screws project through the perforations and into the female screws at lower portion of casting C.

The adjusting-screws d are insulated from the plate D by a vulcanite plate and sleeve d°.

Attached by screws e to the ring C, and at each side thereof, are thin brass plates or brackets E that extend inwardly nearly to the center of the diaphragm, and are provided at their inward ends with perforations, which carry carbon-holding tubes E' of wood—apparently maple The bores of these tubes are in line with the carbon-holding cups d^5 upon the springs D', and the carbon-holding cups O, O^2, upon the diaphragm respectively.

From the appearance of the bores of these tubes, I should judge that carbon balls have been placed or used in them, and I have so indicated such balls by dotted lines, at figure right side of sheet 2.

Pivoted to the upper ends of each of the plates D are switch plates D^3, the outer ends of which may be swung to and upon the upper ends of two conducting posts of brass D^4, projecting from the inside surface of the door, as shown at right of figure in drawing, sheet 2, and also in sheet 1, and also may be swung together; one of these posts is connected by ordinary wire to the upper hinge *b* of the door B, which hinge is also connected by conducting wire to fastening plates, *n n'* held together and upon the end of the wire by a screw n^2—a sort of binding post.

These plates, or binding post, are connected by an ordinary conducting wire, to the insulated carbon-holding cup O^2 upon the diaphragm.

The diaphragm is connected with the lower hinge, *b*, of the door, by an ordinary conducting wire, which is soldered to the diaphragm at P. The remaining post D^4 is connected by an ordinary conducting wire to one of two switch plates, J', attached to the inside surface of the bottom of the box.

A piece of paper *m* is placed over the conducting wire upon the inside of the door, said piece of paper being held in place by a tack *m'*.

The switch plate J', which is nearest to the lower left-hand corner of the plan of the bottom, in sheet 2, is connected to D^4 by the wire already mentioned, and is also connected by a switch J with another switch plate, to which latter the switch is pivoted by an iron screw *j*, which passes through both switch and plate and into the bottom of the box.

The switch and plates referred to above are shown at the left of bottom plan view, sheet 2, of the drawings.

To the bottom of the box, at the right side of the figure last referred to, are similar switch plates J' and switch J, one of which plates—the one to which the latter switch is pivoted—is connected by an ordinary conducting wire to the right hand one of two induction coils H, held in place against the back of the box, near its bottom, by straps *h*, of tinned iron, commonly known as tin, and brads *h'*, which pass through said straps and into the wood of the box.

The point of connection is marked CP on the coil of the machine.

Adjourned until Tuesday, December 6, at 10 o'clock, A. M.

December 6, 1881, 10 *o'clock*, A. M.

Examination resumed pursuant to adjournment.

Present same counsel as yesterday.

Re-direct examination of W. H. H. Knight by Mr. Hill continued:

[*Witness continues.*]

The induction coil H referred to is connected to the bottom hinge *b* of the box by an ordinary conducting wire. The point where this wire leaves the coil is marked ZP in the instrument.

This coil is also connected by an ordinary conducting wire, with the left hand one of the two central switch plates lettered i', of brass.

Pivoted upon and in contact with this switch plate is a brass switch I'. The pivotal screw i^2 is of iron and passes through said switch and plate and into the back of the instrument.

The remaining central switch plate i', to the right of the switch plate last mentioned, is of brass and similar in form to the switch plate described, and is provided with a similar switch I', of brass, and pivotal screw i^2, of iron.

A small piece of copper wire is connected to the switch plate, and is not connected to anything else.

The outer ends of the two switches I' may be swung into contact, as shown in the drawings, or may be swung into contact with contact plates I^2, of brass, arranged upon the back of the instrument, as shown in the drawings, sheet 1.

The contact plates I^2 are held to the back of the instrument by small iron screws, and are provided at their lower edges with beveled portions i^3.

One of these contact plates—the one at the right of the instrument—is connected by an ordinary conducting wire, with a binding post upon the top of the instrument, at the right side thereof, as shown in sheet 1 of the drawings.

The remaining contact plate I^2 is also connected with a similar binding post upon the top of the instrument, at the left side thereof.

The binding posts referred to are of brass, and lettered L in the drawings, as are all the binding posts upon the instrument.

The right side of the body of the instrument is provided, near its top, with two binding posts, (as shown in the drawings, in the figure at left hand of sheet 2,) one of which holds in place a switch K, of brass, provided, at it lower end, with a wooden handle *k*.

Through the side of the box, at a point beneath the lower end *k*, of the switch last mentioned, extends a brass plug, the ends of which project slightly beyond the inner and outer surfaces of the side referred to. The switch last mentioned may be swung into or out of contact with the outer end of this plug. The inner end of this plug is connected by an ordinary conducting wire, with one of the switch plates upon the bottom of the instrument, inside (the one at lower right-hand corner of bottom plan, sheet 2.)

There is also another switch K, of brass, upon the outer surface of the right side (shown in "Elevation of right side," at left-hand side of sheet 2 of drawings, and also shown in sheet 1) of the instrument.

The upper end of this switch is pivoted by a brass screw k' to the side of the instrument, the inner end of which screw projects slightly beyond the inner surface of the side of the instrument, and is connected by an ordinary conducting wire with one of the two binding posts L referred to—the one nearest the back.

The lower end of the switch K last referred to is provided with a wooden handle *k*.

Through the side of the box, at a point directly opposite or beneath such handle, extends a brass post, the ends of which project slightly beyond the inner and outer surfaces of the side.

The switch last referred to may be swung into contact or against the outer end of this post. The inner end of the post is connected by an ordinary conducting wire with the induction coil at left of instrument.

The opposite left-hand side of instrument is also provided, near its top and upon its outer surface, with two binding posts, similar to those described, the screws or inner ends of which project slightly beyond the inner surface of the side, and are each connected by an ordinary wire with the upper hinge *b* of the box. Between these two posts on the outside of the instrument the letter "Z" is marked, and between the two corresponding posts on the right side of the instrument the letter "C" is marked.

Upon the back of the instrument, inside, and at the right and left of the switches I' respectively, are two switches I, of brass, pivoted at their lower ends by iron screws i^2 to switch plates *i*. The screws i^2 serve to hold both switches and plates in position upon the back of the box.

The upper free end of the switches I may be swung into contact with the contact plates I^2.

The lower end of one of the switch plates *i* (the one at the right of sheet 1) is connected by an ordinary conducting wire with the induction coil at right side of instrument, at the place marked "Z S" on the instrument.

The remaining switch plate *i* is provided with a short piece of ordinary copper connecting wire.

The induction coil at left of instrument is provided with three more conducting wires, the ends of which are not connected with any part of the instrument. One of these wires referred to is not shown in the drawings, having been inadvertently omitted.

The back of the instrument is split or cracked from top to bottom, said split being shown in the drawings, sheet 1, and marked "split."

Q. Q. 148. Referring to the wires which form the several electric connections within the instrument, state whether you have, at any time, while making the drawings or since, broken or disconnected any of said wires.

A. I have; the wire extending from the diaphragm at P to the lower hinge I disconnected from the hinge, in order to draw the diaphragm. This was after I had drawn sheet 1.

At the time, or just before drawing this instrument, I accidentally broke some of the connections within the body of the instrument. I do not exactly remember which.

Q. Q. 149. State whether you have taken nearly all of these instruments apart here, during your examination as a witness.

A. I have.

Q. Q. 150 Referring to "Exhibit M drawing," I find a note thereon stating that at one time the diaphragm of this instrument was made of tin, and was rigidly attached to the post F, by a screw which entered the recess *f*, in the post F. Did you make that statement from your own knowledge or from hearsay?

A. When making this drawing, I noticed the recess referred to in the end of the post, and asked Mr. Drawbaugh its purpose. The answer he gave me was, in substance, the same as the note I have placed upon the drawing.

Q. Q. 150½. I find in "Exhibit C drawing" a note stating that a second or auxiliary diaphragm, of gold-beater's skin, was originally used in this instrument; said diaphragm being held in place by the ring E. Do you know personally or only from hearsay that said diaphragm was originally used?

A. I noticed a fragment apparently, of paper or bladder, surround-

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ing the instrument, when I was making the drawing. I inquired of Mr. Drawbaugh what it was, and was told that it was gold-beater's skin, as I have stated in my note, and that it had originally formed the diaphragm.

Recess for dinner until 2, P. M.

December 6, 1881, 2 *o'clock*, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Re-direct examination of W. H. H. Knight by Mr. Hill continued:

Q. Q. 151. Referring to "Exhibit reproduced I drawing, No. 1," I find thereon a note stating that "The above view shows the instrument provided with two diaphragms, as used in one form, the upper of the two diaphragms being perforated as shown." Was that statement made from personal knowledge or from hearsay ?

A. The note is in substance what I was told by Mr. Drawbaugh at the time I was drawing this instrument.

Q. Q. 152. I find on "Exhibit reproduced L drawing," a note to the effect that "The above drawings show one of the original forms of instrument 'L.'" Was that statement made of your own knowledge ?

A. It was not. Mr. Drawbaugh told me that several instruments had been made similar in many respects to L, and that the instrument, of which the figures referred to are drawings, was similar in form to one of said instruments.

Q. Q. 153. I find on "Exhibit reproduced M drawing," a statement that "The above drawings show the original form of instrument 'M.'" Was that statement made of your own personal knowledge ?

A. It was not. I was informed by Mr. Drawbaugh that the instrument from which the drawings referred to were made was in form similar to the original instrument "M."

[*Complainants' counsel objects to each and all of the notes made by the witness on the drawings, and quoted in interrogatories* 150–153, *and asks that they be stricken from the record.*]

Q. Q. 154. State whether you have had opportunity to observe and know whether Mr. Daniel Drawbaugh, in ordinary conversation, and in his attempts at orally describing mechanical devices, exhibits much or little facility of expression, and much or little power to describe mechanical devices, so as to make himself clearly understood by others?

[*Question objected to by Mr. Storrow.*]

A. I have known Mr. Drawbaugh since the spring of 1880, since which time I have met him at various places, have been at his shop and house, and have spent a great deal of time in his society. I have heard him during such times explain, or attempt to explain, various mechanical devices, and have noticed that such explanations were not clearly made, inasmuch as while he evidently thoroughly understood what he was speaking of, yet he could give no perfect expression to his thoughts. Apparently his ideas came faster than he could find words to express himself. This caused him to jump suddenly from one to another part of his description. Close attention to his description and frequent questioning are necessary, in order to thoroughly understand what he is trying to describe. This has been the case whenever he has tried to give me a description of any mechanical device, which he has done several times and about various machines for different purposes.

Q. Q. 155. And is this as true of his attempted descriptions of other mechanical devices as of telephones?

A. It is.

Re-cross-examination by Mr. Storrow:

Re-cross-Q. 156. When did you first see Drawbaugh?

A. At some time in the early spring of 1880, I think.

Re-cross-Q. 157. Where?

A. At Washington.

Re-cross-Q. 158. Where, in Washington?

A. At the office of L. Hill, Esq., 617 Seventh street.

Re-cross-Q. 159. How did you happen to be at that office?

A. I occupied desk-room there as a draughtsman.

Re-cross-Q. 160. Did you have any conversation there then with Drawbaugh about any machines he had constructed or devised?

A. I did.

Re-cross-Q. 161. Did he have with him at that time any of the instruments about which you have testified?

A. I think not; I think it was later that I first saw those instruments—about June or July, to the best of my knowledge.

Re-cross-Q. 162. How much time elapsed between those two visits, as near as you can recollect?

A. I cannot now say. We were accustomed to having strangers come and go at all times, which being the case, I did not charge my mind with the visit of any particular one, as is true of to-day.

Re-cross-Q. 163. Did you have any conversation with him about telephones the first time you saw him there?

A. I do not remember having had any conversation with him about telephones, particularly at that time.

Re-cross-Q. 164. Whom did you see with him at that time?

A. I do not remember who; there was some one, I think, came to the office with him, but who, I cannot say.

Re-cross-Q. 165. I understand from your testimony that you began to make these drawings at Harrisburg, in the latter part of April, 1881, and continued at work upon them at Harrisburg until some time in August, 1881. Is that the case?

A. Nearly all this time; part of this time, however, I was at Washington, New York, Boston, and other cities.

Re-cross-Q. 166. While you were making these drawings in Harrisburg, did you see much of Mr. Drawbaugh?

A. Almost every day I saw him.

Re-cross-Q. 167. What has been the nature of your occupation for the last ten years?

A. Ten years ago I was employed by the United States Engineer Corps, on the military works in Boston harbor, at which time I had charge of the wood-working division, and at one time I had general oversight of the work at the place where I was stationed. Since that time I have been engaged, at various times, in mechanical occupations, both in wood and metal, having had charge of work in both branches. For the past three or more years I have confined myself to mechanical drawing, both designing machinery, working drawings, and Patent Office drawings—more particularly Patent Office drawings.

About the time I first went to Washington I was in the United States Patent Office as a machinist, doing the repairing of the damaged models. While there I had from two to four assistants during the entire time. My work consisted of repairing such models, which repairing was done from the drawings.

Re-cross-Q. 168. Do the instruments "A," "D," "E," "G," "H," "J," "K," "L," "M," "N," "O," "P," "Q," exhibit skillful mechanical workmanship?

A. I should say a first-class mechanic had made them.

Re-cross- Q. 169. What should you say about "B." Does that exhibit first-class mechanical workmanship?

A. The instrument appears to me to have been made as an experiment. I consider myself a mechanic and have myself made far cruder experimental machines, in order to test certain movements or results.

Re-cross-Q. 170. Should you make the same answer about "C?"

A. So far as the base, supports, and uprights were concerned, I should.

Re-cross-Q. 171. Should you make a similar answer about the broken glass tumbler instrument "F?"

A. That instrument appears to have been made with care and by a person who thoroughly understood his business.

Re-cross-Q. 172. I notice in instrument "D" some blocks of wood or paste-board between the magnet and the walnut case, and a couple of wood-screws to hold the magnet in place. I do not see them in your drawing, and therefore suppose that they have been recently added. Is that a fact?

A. At the time of making the drawing the paste-board and screws referred to were not on the instrument, but during the making of the drawings, I had occasion to take the electro-magnet and permanent magnet from the body a number of times, which probably loosened them and rendered the paste-board and screws necessary to hold them in place to the body of the instrument.

Re-cross-Q. 173. Please look at instrument "J" and at the figure at the right-hand side of sheet 1 of "J," and particularly at the left-hand switch I', of the two central switches. You stated that when that was thrown over to the left it would touch the switch plate I^2. Is it not a fact that it can barely touch that plate, and cannot make the good and full contact that the switches in that instrument generally make?

A. Although said switch does not make as good a contact as the remaining switches, I think sufficient contact is made to fully answer all practical purposes.

Re-cross-Q. 174. Your same drawing, as corrected by you in your re-direct examination, shows, from the left-hand induction coil, three wires with loose ends connecting to nothing. I understand that it was one of those three wires which was accidentally broken by you when beginning to make your drawing, sheet 1. Am I correct in that?

A. It was; but which of the three I cannot say at this time.

Re-cross-Q. 175. With that exception, your drawing shows the wire connections as they existed when the instrument was brought to you, does it not?

A. It does.

Re-cross-Q. 176. The instrument to-day has the same wire connections as shown in the drawing, with the exception that the diaphragm wire is broken away from the hinge, as stated in your one hundred and seventy-fourth answer, has it not?

A. It has.

Re-cross-Q. 177. Please look at the drawing of "N." The figure marked "Front elevation, cap removed" shows that the dividing line between the two semi-circles forming the diaphragm runs along a line that would join the cores of the electro-magnets. Why did you put the diaphragm in that position?

A. Merely because I placed them without instructions and without design. I wanted to show the semi-circular diaphragm, and, if possible, the position of the magnets below such diaphragm, and so placed the diaphragm slightly apart, as shown, thinking the magnets would show through the opening. Afterwards, finding they did not show, I dotted them in. It may or may not be the correct position of the diaphragm. This, however, I do not know.

Re-cross-Q. 178. In the instrument "P reproduced," the pendant carbon block *f*, shown on sheet 2, is solid, is it not?

A. With the exception of the perforation for the spindle *f'*, upon which it hangs, it is.

Re-cross-Q. 179. In the instrument "Exhibit P," I understand from your testimony that the corresponding block (lettered O, on sheet 2, lower right hand figure) was divided, nearly its whole length, by a saw-scarf cut up from below in a plane parallel to the diaphragm, thus making a sort of fork, and that the leg of this fork nearest the diaphragm was broken off near the top, as shown by the diagonal line immediately above the letter O, in the same figure. Am I right in that?

A. It was so divided and broken, as shown. It may or may not have been made by a saw—it apparently was.

Re-cross-Q. 180. I observe that in comparing your "Drawing exhibit P, sheet 2," with your drawing "Exhibit reproduced P, sheet 2," rear elevations, that the connections are not the same in both. I suppose that you drew each of them just as they were at the time of drawing, did you not?

A. I did.

Re-cross-Q. 181. Comparing the upper right-hand figure of sheet 2, of "P," and the upper left-hand figure of sheet 3, of "P reproduced," I understand that when instrument "P" was brought to you it did not have the permanent horse-shoe magnet nor the electric magnet carried on one pole of it, nor the magnetic post carried on the other pole, nor the adjusting-screw for the permanent magnet, corresponding to what you have shown in "P reproduced." Am I right in that?

A. Such magnet, post, and screw were not in the instrument.

Re-cross-Q. 182. The recess at the right-hand side of the lower right-hand figure, sheet 2, of "Exhibit P drawing," did not have any diaphragm or rubber ring when the instrument was brought to you, did it?

A. No.

Re-cross-Q. 183. The instrument "P" had only one induction coil when it was brought to you, had it?

A. Only one.

Re-cross-Q. 184. In "Exhibit M," I understand that the wires run from the inner end of one binding post to the nearest coil; then from the other end of the wire of that coil to the second coil; then from the other end of the wire of the second coil to the second binding post. Am I correct in that?

A. They so run, the electro-magnets being wound in opposite directions.

Re-cross-Q. 185. Are you certain as to the time when you first saw Mr. Drawbaugh at Washington, being in the spring of 1880?

A. I am not positive as to that, but know that it was in the early part of that year; it may, however, have been in early summer.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 6th day of December, 1881.

FRED. M. OTT,
Examiner.

W. H. H. KNIGHT.

[*The examiner, at the request of counsel for respondents and with the*

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consent of complainants' counsel, certifies that he has ascertained that "Pennsylvania Day" at the Centennial at Philadelphia was the 28th day of September, 1876. Fred. M. Ott,
Examiner.]

Adjourned until December 7th, 1881, at 10 o'clock, A. M.

December 7th, 1881, 10 *o'clock*, A. M.

Examination resumed pursuant to adjournment.

Present, Mr. Hill and Mr. Jacobs for respondents, and Mr. Storrow for complainants.

Daniel Drawbaugh, *being produced, sworn, and examined, saith:*

Examined by Mr. Hill:

My age is fifty-four; residence, Eberly's Mills, Cumberland county, Pennsylvania; occupation, machinist—that is the way I generally style it.

Q. 1. Are you the same Daniel Drawbaugh who is alleged in the defendants' answers to have invented the electric-speaking telephone prior to the invention of Alexander Graham Bell?

A. Yes, sir.

Q. 2. How long have you lived at Eberly's Mills?

A. All the days of my life, except about three years, to the best of my recollection.

Q. 3. From April 1st, 1876, to April 1, 1877, did you live at Eberly's Mills or Mechanicsburg?

A. I lived at Mechanicsburg; I moved there about the latter part of March, 1876; I can't give you the exact date, though.

Q. 4. Since you moved back from Mechanicsburg, about April 1, 1877, have you continuously resided at Eberly's Mills?

A. Yes, sir.

Q. 5. From the beginning of the war of the Rebellion down to the latter part of March, 1876, did you continuously reside at Eberly's Mills?

A. Yes, sir.

Q. 6. It is in evidence here that the "Drawbaugh Pump Company," by which I mean the first Company organized by Mr. William R. Gorgas and others for manufacturing your pump, as referred to on page

684 [655] of the defendants' printed record, was organized in May, 1867. At that time, May, 1867, in what house were you living at Eberly's Mills?

A. I was living in the same house I am living in now; the house back of the flouring mill.

Q. 7. At that time, May, 1867, where did you have your office or workshop?

A. The first story of the same house that I was living in.

Q. 8. Had you had it there for a good many years prior to that time?

A. Yes, sir; I moved there about 1856 and had my shop in the first story all that time.

Q. 9. The Drawbaugh Pump Company manufactured in the building where your shop now is, did it not?

A. Yes, sir.

Q. 10. Did you move your shop down to the building so occupied by the Company?

A. Yes, sir.

Q. 11. As near as you can remember, when did you move your shop down from your house to the Company's shop?

A. As near as I can recollect, it was in the fall of 1867, or winter of 1867-8. I can't give the exact date.

Q. 12. Ever since you moved your shop to the building occupied by the Company, have you continued to use the latter building as a workshop?

A. Yes, sir; I have had access to it ever since; part of that time I have been overseer there for different companies. I kept my tools there, and have had my shop there ever since.

Q. 13. How far is that shop from the house where you reside?

A. As near as I can judge, it would be between two and three hundred yards.

Q. 14. You have a wife and family, have you not?

A. I have.

Q. 15. How many of your children are now living?

A. Six.

Q. 16. What is the age and name of your oldest living child?

A. Her name is Laura and her age about twenty-two. I could give her birthday from a record that I have at home, but I could not give it here, from memory.

Q. 17. State whether or not her health is such as to enable her to be called as a witness in this case.

A. Her mind is very defective; particularly at certain periods; so much so as to render it improper to call her as a witness.

Q. 18. How long has she been an invalid?

A. From about the age of three years. Since she was quite a small child.

Q. 19. How old is your next oldest living child?

A. Between fifteen and sixteen. I have not informed myself as to their ages, as I could have done if I thought of it. Her name is Iola. We call her "Olie."

Q. 20. How many children have you lost by death?

A. Four.

Q. 21. You had at one time a daughter Emma had you not?

A. Yes, sir.

Q. 22. About what time did she die?

A. She died about 1870, I think; it might have been 1871. I can furnish the exact date if required.

Q. 23. How old was she at the time of her death?

A. Fifteen years and two months. I find I have a memorandum in my pocket which states that she died November 18, 1871.

Q. 24. Did you lose other children about the time of her death?

A. Yes, sir; two children, including her. The name of the other one was Ida. The two died the same week.

Q. 25. How old is your youngest living child?

A. About six years.

Q. 26. Have you been in the habit of making and preserving any written memoranda or records, to show the dates of your various inventions and improvements in telephones?

A. No, sir; not further than that I used to make plans on drafting boards, for working by.

Q. 27. Were they preserved?

A. No, sir.

Q. 28. Did you visit Washington city just previous to the breaking out of the Rebellion, in 1861?

A. Yes, sir.

Q. 29. State the time and the purpose of such visit, as near as you can.

A. I went to Washington city about the time stated, previous to the Rebellion, to have papers drawn up relative to the re-issue of a stave-machine, which I had patented previous to that time. There is a receipt among some of my papers which gives the date.

Q. 30. Please look at the receipt now shown you and state whether it is the receipt referred to or not.

A. Yes, sir; I believe that to be the receipt referred to.

[*Mr. Hill produces the receipt for inspection of counsel for complainants, and, by consent, a copy, as follows, is substituted for the original, the original to be produced when called for. The receipt is as follows:*]

"WASHINGTON, *January* 30, '61.

"Received of D. Drawbaugh the sum of twenty dollars—fifteen of which is for Gov. fee on his reissue in stave-machine & five for drawings.

"C. M. ALEXANDER."

Q. 31. Was that receipt given while you were in Washington on the visit last referred to?

A. Yes, sir.

Q. 32. Have you any recollection of meeting and conversing with a party of students at Washington while on that visit?

A. Yes, sir.

Q. 33. Do you remember any of the subjects of your conversation with them? If so, what subjects were talked about?

A. Yes, sir; I remember some of the subjects of conversation. I talked to them about a certain machine I was working on then. I termed it a machine for transmitting sound. I can't remember any words or parts that I mentioned. I would qualify the above answer a little. I don't know that I was working upon the machine at that time, but I had my mind employed upon it.

Q. 34. Do you recollect any of your statements to them about it? Did you state to them how far you thought you could convey sound, or by what means?

[*Objected to by Mr. Storrow.*]

A. To the best of my recollection, I stated that I thought I could convey sound to some distance, I would not be positive how far, and I may have stated that it would be by means of electricity; but I would not be positive about that either. I can't tell exactly when I first conceived the idea of conveying sound by electricity.

Q. 35. What is the best of your recollection and belief as to whether you talked to them about conveying sound by electricity at that time?

A. I believe, as I stated before; I am not so positive that I mentioned to them about electricity. I am not so sure that I had the idea about electricity. I know that it is a great while ago that I conceived that idea, but any particular period I can't state. I may have mentioned to them, though, that it was by means of electricity; I can't remember.

Q. 36. Do you remember the names of any of those students, or their place of residence?

A. I do not their names; the place of residence I do—of two of them; one of them, that I conversed the most with, was from Washington, Washington county, Pennsylvania; the other one was from Virginia; I can't give you his place or county; I only remember that he was from Virginia.

Q. 37. Mr. Henry B. Eberly, a witness heretofore examined for defendants in this case, stated in his thirteenth answer, [*Defdts' printed record, page* 297, 283,] and referring to you as follows:

> "I do recollect of him speaking about attaching an instrument to the office, by which he could hear all that was going on at the mill-office, without leaving his house. He made this remark one Sunday in the mill-office, in company of we boys, and a party that usually congregated in there. This was between 1861 and 1864; that is the nearest I can come at it; it was during the war."

State whether or not you recollect the particular conversation to which Mr. Eberly here refers.

A. I don't have a very distinct recollection, because them conversations were so many, but I have a faint recollection of some such conversation; I don't want to be too positive.

Q. 38. State whether or not you know of any fact that would lead you to believe that Mr. Eberly made any mistake in putting that conversation as far back as during the war—from 1861 to 1864.

[*Objected to by Mr. Storrow.*]

A. No, sir; I do not. I believe that I had them ideas in my mind at that time, or it might have been before.

Q. 39. Mr. W. M. Lory, a witness who has been heretofore examined in behalf of defendants in this case, has given a deposition, which I will now read to you.

[*Mr. Hill reads Mr. Lory's deposition, printed on pages* 235, 236, *and*

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237 [225-6-7] *of Defendants' record, and then continues his interrogatory, as follows:*]

Please state whether you have any recollection of the particular conversation to which Mr. Lory here refers.

A. I don't have any distinct recollection of any particular—we had a good many conversations, particularly on mechanics. This conversation may be correct. I was thinking on the subject as early, I suppose, as he states here. It may be as early as the time or dates he mentions in his statement, that I made an instrument, in which I used a tea-cup for the body of the instrument. I had other temporary apparatus connected with it, but I can't recollect the shape. I have been trying to recall it, and can't do it. I may have shown him a drawing in relation to an apparatus of the kind spoken of. I was in the habit of making sketches or drawings at the time when I would be working on any inventions—not only this particular one, but all inventions.

Q. 40. State whether or not you saw Mr. Lory, or had any conversation with him, between the time when he moved away from Eberly's Mills and last winter—1880-1881.

A. To the best of my recollection, I did not.

Q. 41. Mr. James A. Smith, a witness who has testified in behalf of defendants in this case, in his seventh answer, [*on page* 542 [519] *of Defendants' record*,] states as follows:

> "Early in the spring of 1867, Daniel Drawbaugh came into the mill-office, and had in his hand a copy of the *Scientific American*, on which there was small black spaces, I could not tell exactly the size, represented as streaks or rays of light striking out from a center. We began—I don't know how the conversation began—talking about electricity. I thought this was something on electricity. From this we began to talk about the telegraph—led into a conversation about the telegraph, and Mr. Drawbaugh remarked that the telegraph would yet be superseded, and men would talk audibly, as face to face, at any distance, saying at the same time that he was experimenting. I asked him at the time if he thought so, when he remarked: 'I am confident of it.' I don't remember of any other conversation, until within three days of that time—it might have been the next day, in his shop, when he told me that he and his daughter, I forget her name, but he says Emmy, had talked together, and that there was a floor and two partitions between them. At this time he did not tell me by what means they had conversed, but it made the impression on my mind that it was by a wire, but he did not say that. I don't know what made the impression, but that was the impression on my mind, that it was a wire. The daughter to whom Mr. Drawbaugh referred is now dead. I do not remember her name, but it was his oldest daughter."

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State whether or not you have any recollection of the particular conversation to which Mr. Smith here refers.

A. I don't have a recollection to the particular one conversation. I went there very frequently to the mill, to sit in the office and read. This conversation may have occurred, because I was then experimenting on that particular invention, and was assisted by my daughter. I am positive of that.

Recess for dinner, until 2 o'clock, P. M.

December 7, 1881, 2 *o'clock*, P. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Examination of Daniel Drawbaugh by Mr. Hill continued:

Q. 42. How was your daughter accustomed to assist you in those experiments?

A. She assisted me by speaking or producing sounds at one end of the apparatus.

Q. 43. Do you mean while you listened at the other end?

A. Yes, sir; and she may have listened, too, when I may have requested her to listen, while I would produce a sound—perhaps a word spoken, musical tone, or sound produced by some other apparatus or means. I used to adopt different ways—produce different sounds.

Q. 44. If you have a distinct recollection as to how large your daughter was during the early time of her assisting you in those experiments, please state, to the best of your knowledge and belief, and from your recollection of her size at the time, about how old she was when you first began to make use of her as an assistant in these experiments.

A. To the best of my recollection and judgment now, she was about six or seven years. I could not get at anything very accurate. I judge it to be that, alluding to the time she assisted me first.

Q. 45. She must have been quite a small child then—is that your recollection or not?

A. Yes; she was pretty small, I am positive about that. I judge her by a daughter I now have that is about that age—over six; and I know she was old enough to speak plainly; and I might state another reason. She would do what I would say—would not laugh at me, as some others did.

Q. 46. Was she your oldest child at the time?

A. Yes, sir.

Q. 47. You took out two patents on faucets, in November, 1866. Do you remmeber the fact?

A. Yes, sir; I remember the fact.

Q. 48. What is your best recollection and belief as to whether you first had the tea cup-machine for conveying sound from one place to another before or after the time of taking out those two faucet patents?

A. I am pretty confident that I had the cup machine before I took out those two patents. I know the cup instrument was made before I went to the lower shop, the one I now occupy.

Q. 49. Do you recollect the construction of that cup machinery pretty well at the present time?

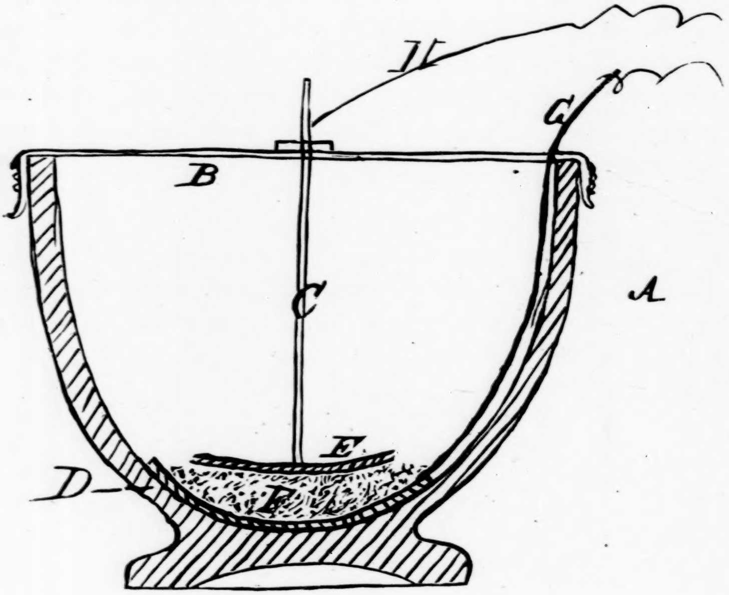
A Yes, sir; I think I can describe it clearly by a sketch—that is, I will make a sketch.

Q. 50. Please make a sketch of it.

[*Witness sketches with a pencil, and then answers.*]

A. Now that relates to the original cup. There were a good many modifications.

[*Defendants' counsel offers the sketch in evidence, to be marked* "*Exhibit D. Drawbaugh sketch, No.* 1."]



Q. 51. Please describe that cup-machine by reference to your sketch, and indicate by letters of reference the different parts, as you describe them.

A. A represents a section of the cup; B is a diaphragm of thin material, I don't remember exactly what; C was a metal rod, attached at its upper end to the diaphragm; at the lower end of said rod is a plate E attached to it; D is a second plate, concave, placed in the bottom of the cup; between these two plates was placed a material, which I term low conductor.

G is a wire running down into the cup and fastened to plate D; H is a second wire, attached to rod C; it occurs to me that it was wrapped around the rod; I don't remember whether it was soldered, or in what way it was attached.

One of those wires was placed to one pole of a battery, and the other to the other pole of the battery.

Q. 52. Was the cup an. ordinary porcelain or earthen-ware tea cup?

A. Yes, sir; a porcelain cup I was in the habit of calling such ware. It was a non-conductor of electricity.

Q. 53. Of what material were the two plates D and E composed?

A. To the best of my recollection, they were composed of copper. The lower one, I am more particularly sure, was of copper.

Q. 54. Of what material was the wire C composed?

A. I won't be too sure, but I think it was of brass, as I was in the custom of having brass wire around the shop for other work. The wire G may have been of the same material. I am pretty confident that the wire H was of copper, as that would be attached to the battery.

Q. 55. Are you sure whether the wires C, G, H, were electric conductors or not?

A. Yes, sir; I am positively sure that they were.

Q. 56. How was the diaphragm B fastened to the cup?

A. By a cord, or string, wrapped around the upper edge of the cup The diaphragm was of thin material.

Q. 57. You state that F was a material which you called a low conductor. Did you mean a low conductor of electricity?

A. Yes, sir; that is what I meant.

Q. 58. Did you use that cup instrument as a transmitter or receiver of sound?

A. As a transmitter of sound.

Q. 59. Explain your manner of using it in your experiments.

A. By producing sounds immediately at the top of the instrument, close to the diaphragm.

Q. 60. Please state whether you tried different materials for the diaphragm, and if so, mention the different materials you used.

A. Yes, sir; I used different materials. I ain't too positive that there were so many different materials used on the *cup*. I generally used hog's bladder, or some membranes of that kind.

Q. 61. Please state what material you used for the low conductor F in the cup machine; and, if you used different materials at different times with that machine, please give us an idea of your different experiments, with relation to such materials.

A. I did use different materials at different times. I have used earth that I got out between rocks—clean, fine earth. I used that in combination with plumbago at some certain times. I used plumbago alone at times, and I used fine or pulverized charcoal. I could not enumerate all. It has been a good while ago, and I don't remember all the different materials I did use.

Q. 62. State whether you did or did not make a great many experiments with different materials and with a great variety of materials, to ascertain what would answer best for the purpose of the low conductor F?

[*Objected to by Mr. Storrow as leading.*]

A. Yes, sir; I did, but I can't just now enumerate all that I did try. I remember, too, of using finely divided metals, and that was in combination with some of the others again. I also used it with plumbago, and perhaps in combination with earth. The experiments were so varied that I can't remember accurately every particular.

Q. 63. By your statement that you had the wires H G attached or connected to a battery, do you wish to be understood that you had it so connected when using the machine to transmit sound?

[*Objected to by Mr. Storrow as leading.*]

[*Question withdrawn by Mr. Hill.*]

[*Mr. Storrow objects that the difficulty is not removed by withdrawing the question after the witness has heard it.*]

Q. 64. Why did you use a low conductor F in your cup machine?

A. For the purpose of obtaining currents of different strength or intensity.

Q. 65. How did the low conductor, as used in your cup machine, enable you to vary the strength of the current?

A. By the compressibility of the material of the low conductor, the more compression, the more current—the stronger the current.

Q. 66. Did the instrument produce different degrees of compression on the low conductor?—and if so, explain how.

A. The instrument did produce different degrees; part of my experiment was by testing it with a galvanometer. The instrument produced different degrees of compression by the vibrations of the diaphragm.

Q. 67. What caused the vibrations of the diaphragm?

A. The sound produced immediately in front of the diaphragm. You might say, the air waves, produced by the sound, impinged upon the diaphragm.

Q. 68. When you were thus using the instrument, did you have an electric current passing through it or not?

A. Yes, sir; I had.

Q. 69. How was that current generated?

A. By a galvanic battery. The instrument was connected to the two poles of the battery by the two wires G and H.

Q. 70. When you were using the instrument, was that current a continuous current or was it intended to be broken by the operation of the instrument?

A. It was a continuous current, not a broken current. It was a modified current—not continuously of one strength.

Q. 71. Explain the reason why the current was not continuously of one strength when the machine was operating?

A. Because the low conductor F, being more compressed at some times than others, would vary the intensity of the current. The more it would be compressed the more would be the volume of the current—the more volume would pass.

Adjourned until December 8th, 1881, at 10 30, A. M.

December 8th, 1881, 10.30, A. M.

Examination resumed pursuant to adjournment.

Present, Mr. Smith and Mr. Storrow for complainants, and Mr. Hill and Mr. Jacobs for respondents.

Examination of Mr. Daniel Drawbaugh by Mr. Hill continued:

Q. 72. In the use of that old cup machine for the transmission of sound by electricity, did you succeed in transmitting any sounds through it so that they could be heard?

A. Yes, sir, I did; but I don't want it to be supposed—all parts of sentences—some words but feebly. I tried sounds—different sounds—made in the way of noises. I don't remember what different sounds, but I could distinguish different kinds of sounds more distinctly than I would words. What I wish to convey by that is that I could distinguish the difference between different sounds.

Q. 73. Could you or not by that old cup machine distinguish vocal sounds from other kinds of sounds?

A. Yes, sir; I know that the results I had there were sufficient to encourage me to go on with the experiments.

Q. 74. As the cup machine was only a transmitter, you must have used with it some kind of a receiver. Do you remember what kind of a receiver you used first with it?

A. The time since then is so long that I have no vivid recollection of any particular one. I had a number of crude apparatuses, but can't exactly remember the shape of any of them. I had membranes stretched over hoops—over a hoop. I remember that, and I had electro-magnets, and the arrangement was varied. I don't remember exactly the arrangement.

Q. 75. Do you recollect whether or not the receiving instruments that you so experimented with, or any part of them, were in the same circuit with the transmitter?

A. Yes, sir; they certainly would have been; I couldn't have had any results otherwise.

Q. 76. This old cup instrument that you have described was constructed with a diaphragm to receive vibrations caused by sound or sound waves. How did you first learn that sound had the effect to set up vibrations in solid substances?

A. By noticing vibrations in solid bodies—the surface of a partition.

Q. 77. How long before you made the cup instrument had you noticed that sound would produce vibrations in partitions?

A. That is a little hard to say; I can't remember how long; it might have been quite a number of years; I don't know.

Q. 78. Prior to making the cup machine, had you made any experi-

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ments to determine the effects of vibration of partitions, or what could be accomplished in the transmission of sounds by the vibrations of partitions?

A. I had made experiments—applied light bars of wood from one door to another. I remember in one particular—I passed through one room into the second room by a bar, and I found that there was sound produced or transmitted by the bar—not through the air, but by the bar.

Q. 79. Prior to the making of the cup machine, had you made any studies or experiments upon the vibrations of the vocal organs in the act of speaking?

A. Yes, sir; I remember I often placed my fingers on my throat or larynx, and uttered words, and the sensation produced by that appeared to be the same as the vibration of a solid body. It appeared to have the same sensation or feeling—and found that there appeared to be no cessation of vibration in words, but a continuous vibration, different from a sudden noise—from a mere tap [indicating by two or three taps upon the table.] There would be an intermission between those taps that would not be in a word—that is, in some words it may be.

Q. 80. Do sounds of different pitch contain the same number of vibrations per second or not?

A. No, sir; they do not. The higher the sound, the more the number of vibrations.

Q. 81. When did you learn this fact?

A. It would be a little hard for me to say when exactly. It occurs to me it was a great while ago. I can't put a particular period. When I was a young man, I used to attend singing school, and the professor used to give the philosophy of sound in that way—high sounds increasing the number of vibrations to the second, and he mentioned, too, I suppose, the number to the second, but my mind does not retain the number.

Q. 82. When you were experimenting with the cup machine, you say you used it in a continuous electric circuit; did it ever occur that that circuit was accidentally broken by the too great vibration of the diaphragm or not?

A. I don't remember whether I noticed it on the cup. I may have noticed that. But that has occurred in other apparatus or machines, I know. I can't remember that it happened with the cup, but it may have.

Q. 83. Please look at the machine marked "B," which I now offer in evidence as "Exhibit B," and state what that machine was, and who made it?

A. That machine was made for a receiver for transmitted sounds, and I made it.

Q. 84. Did you ever use that machine, or anything like it, in connection with the old cup instrument?

A. I ain't too positive. I may have used it with the cup machine. I know I used apparatus, but I ain't too positive that I used this. I may have used this.

Q. 85. Did you make this machine "Exhibit B" before or after you moved your shop from the house close by the grist-mill down to the building where it now is?

A. I won't be too positive that I made it before, but I think I did.

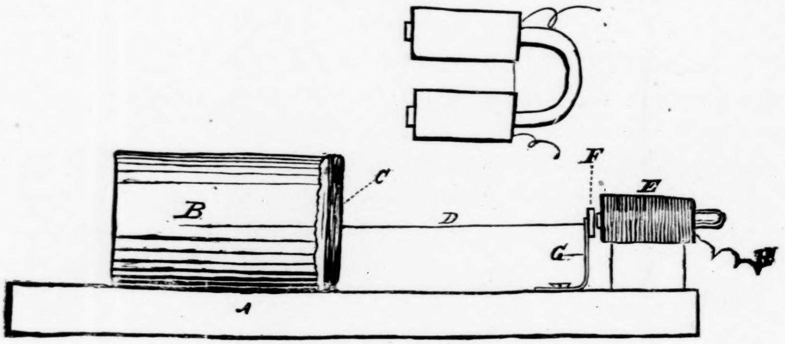
Q. 86. Please look at "Exhibit reproduced B drawing," and state how that compares with "Exhibit B," as the latter existed at about that time.

A. It does not compare, as it existed then—that is, the electro-magnet was not placed as it now is placed. It was some inches further back on the board—that is, some inches from the membrane or diaphragm. I can't distinctly remember the space—say four or five inches from the diaphragm. There was a cord or string fastened to about the center of the diaphragm; it ran back to an armature; that armature was secured to the same base-board. The electro-magnet was immediately in front of the armature—not quite touching.

Q. 87. Will you please make a drawing or sketch of the instrument as it was when in the condition which you have last described?

A. I now make it, and here it is.

[*Defendants' counsel puts said sketch in evidence as "Exhibit D. Drawbaugh sketch, No. 2." The following is a reduced wood-cut of it.*]



Q. 88. Please describe the machine shown in "Exhibit D. Drawbaugh sketch, No. 2," making reference to the drawing and reference letters thereon in your description.

A. A represents the base-board, of wood; B a tin can; it was a can with the bottom out; C represents the membrane or diaphragm; D a string or cord, one end fastening to the center of diaphragm, the other end attached to armature F; E an electro-magnet; F armature; G a bracket or spring holding armature; H an end of the wire of the coil of electro-magnet. That is the description.

Q. 89. What was the shape of the electro-magnet E?

A. Its shape was the old style magnet—U shape. I might put another figure on the sketch, showing the shape of the electric magnet.

[*The witness thereupon adds to the last-mentioned exhibit a separate figure to represent the electro-magnet.*]

Recess for dinner until 2.30, P. M.

December 8, 1881, 2.30 *o'clock*, P. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Examination of D. Drawbaugh by Mr. Hill continued:

Q. 90. When this instrument, shown in your sketch No. 2, was used as a receiver, what part of it, if any, was in the electric-circuit of the transmitter?

A. The electro-magnet.

Q. 91. What, if anything, was contained in the tin tube B?

A. It had been coated with plaster-of-Paris.

Q. 92. Where did you put your ear to listen to the sounds transmitted?

A. To the end of the tube farthest from the diaphragm.

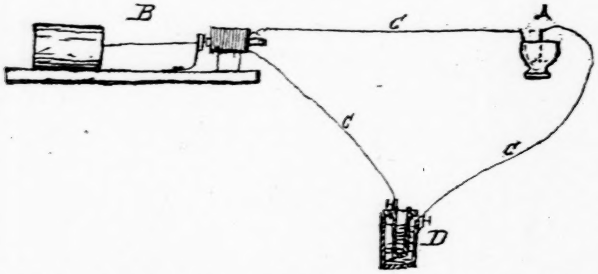
Q. 93. Do you recollect whether or not you used the old cup transmitter in connection with this receiver, which is shown in your sketch No. 2?

A. I think I did; to the best of my recollection, I did.

Q. 94. Will you now please to make a sketch, showing the cup transmitter, this receiver, with the line-wires and battery connections from one to the other? and in doing this you need not be particular about drawing the form of the transmitter and receiver, inasmuch as you have already represented them in your two preceding sketches.

A. Yes, sir; here it is.

[*Mr. Hill offers the sketch in evidence as "Exhibit D. Drawbaugh sketch, No. 3."*]



Q. 95. Please describe the apparatus represented on "Exhibit D. Drawbaugh sketch, No. 3," making use of the sketch and the letters thereon, by way of illustration.

A. A represents the cup transmitter, B the receiver, D galvanic battery, C C C circuit wires.

Q. 96. In the cup transmitter, in what condition was the low conductor? that is to say, was it in the form of a loose powder, or a paste, or a hard cake, or what form?

A. In the form of a loose powder; at times finer than at others. I made changes; sometimes I made it finer than at other times, but in a moist condition generally in the cup transmitter.

Q. 97. Why did you moisten the powder generally in the cup transmitter?

A. Because, in some of the materials I used, it produced better results, or I thought it produced better results, and I got in the habit of moistening it.

Q. 98. In the cup transmitter, did you ever use a mouth-piece above the diaphragm?

A. Yes, sir; a cover with a hole in; I didn't call it a mouth-piece particularly—a cover with a hole in the center.

Q. 99. Referring now to "Exhibit reproduced B drawing," to the best of your recollection and belief, how long was it that you used the form of machine represented in "Exhibit D. Drawbaugh sketch, No. 2,", before you changed the receiver to the form shown in "Exhibit reproduced B drawing"?

A. That would be a little hard for me to give you the length of time; it might have been a year—it might have been two years; I have no recollection of the exact length of time.

Q. 100. Did you ever, at any time, use a metal diaphragm on the cup transmitter, or on the receiver, when it was in the form shown in "Exhibit D. Drawbaugh sketch, No. 2"?

A. I can't remember of using metal at any time on that; I may have, as there was changes made; that is, I used different membranes—soft materials for diaphragms; but I have no recollection of using metal.

Q. 101. Please explain the different parts represented in "Exhibit reproduced B drawing."

A. B is a tin tube or can, as I termed it, with the bottom out; C is a strap of metal, to secure B to the base-board A. D′ represents the diaphragm; *d* armature attached to diaphragm; E electro-magnet; F′ plate to secure magnet to base; G is a metal bracket or spring for giving tension to membrane or diaphragm.

Q. 102. Did you, or did you not, actually use this instrument, "Exhibit B," as a receiver, in the form in which it is shown in "Exhibit reproduced B drawing?"

A. Yes, sir.

Q. 103. State whether or not, as you so used it, the metal strip or spring, marked G, in the drawing, had any electric connection with the circuit or with the instrument.

A. No, sir.

Q. 104. State whether or not, as you used this instrument, "Exhibit B," the electro-magnet marked E was in the line circuit.

A. Yes, sir.

Q. 105. How was the armature *d* secured to the diaphragm?

A. By something adhesive—glue. At other times I used bee's-wax, to secure it.

Q. 106. Did you arrange the armature so that, when vibrating, it would come in contact with the electro-magnet or vibrate in the neighborhood of the poles of the electro-magnet without coming in contact?

A. When I adjusted it, I had it to come close to the poles of the electro-magnet; so close that it would nearly touch; still not in contact. It would not come in contact in vibrating; that would destroy the working of it.

Q. 107. State whether the little metal strip or spring G was adustable or not.

A. Yes, sir; it was. There was a slot towards the outer edge of the bracket or spring for the purpose of setting it up closer to the diaphragm by means of a screw, *g'*.

Q. 108. What, if anything, was contained within the tin tube, B?

A. A coating of plaster-of-Paris.

Q. 109. Why did you apply a coating of plaster-of-Paris inside of the tube of this instrument, and inside of the tube when used, as shown in "Exhibit D. Drawbaugh sketch, No. 2?"

A. It is considered a low conductor of sounds. I had reasoned in my mind that the sound produced by the effect of the electro-magnet wouldn't be absorbed by echo or re-vibration, by the use of the plaster-of-Paris.

Q 110. Was the tin tube which was used in the instrument shown in "Exhibit D. Drawbaugh sketch, No. 2," the same tin tube which was used in "Exhibit B?"

A. I wouldn't like to be too positive on that. There may have been others similar. I made changes; but I think it was the same.

Q. 111. Were the electro-magnet and armature of "Exhibit B" the same identical ones that were used in the machine represented in "Exhibit D. Drawbaugh sketch, No. 2?"

A. No, sir; the first magnets were much larger. There may have been half a dozen changes in magnets; perhaps more. I couldn't tell the number.

Q. 112. Is the base-board of "Exhibit B" the same identical base-board which was used in the machine when in the condition represented in "Exhibit D. Drawbaugh sketch, No. 2?"

A. I think not. I won't be too positive as to that. But it seems to me that the board was longer.

Q. 113. What was the next transmitter which was used after the cup machine, of which you have spoken?

A. A tumbler; that machine, [indicating "F."]

[*Defendants' counsel offer in evidence, as "Exhibit F," the machine last referred to by the witness.*]

Q. 114. Please look at "Exhibit reproduced F drawing," and state whether it does, or does not, correctly represent the tumbler instrument as you used it at any time.

A. Yes, sir; it represents the tumbler instrument as used at a time —not exactly the original—not the arrangement that the original instrument had.

Q. 115. In what respect does it differ from the original instrument F, as first used by you?

A. It differs in this respect. In the reproduction I used a yoke, represented in the drawing of the reproduction, F F; the original having only one post, or bar, or rod, instead of a yoke, as shown in "Exhibit F drawing." There were modifications. The mouth-piece of the original was large—with a larger opening, like that on "Exhibit F." I had made different mouth-pieces—modified them—made them of different shapes. I can't give the different modifications. The first ones were much larger and higher—higher from the diaphragm.

Q. 116. What part or material in the original machine, "Exhibit F," corresponded to the part marked G, in "Exhibit reproduced F drawing"?

A. That was a low conductor, as I termed it.

Q. 117. Please explain the working parts of the machine, as shown in "Exhibit reproduced F drawing."

A. F F represent two rods, passing into the tumbler or instrument A. On the inside and attached to the rods F F is a wooden box D, or cup, for holding the low conductor G. E is a plate passing into said wooden box and resting on to the low conductor. To said plate is attached a rod *e* which passes up and is attached to the diaphragm C, at its center; *d* represents a plate in the bottom of the wooden cup; *d'* is a small wire connecting said under plate *d* to the rod F; H is a wire connected to the diaphragm; B is a wooden mouth-piece attached to the glass tumbler A and secured by pressure in a groove of the mouth-piece B. There are two adjusting screws, one on each rod F, for the purpose of adjusting the wooden box closer to, or further from, plate E.

Q. 118. Of what material were the two plates E and *d*, at the top and bottom respectively of the low conductor?

A. I'll have to answer that by stating that in the modified plan plate E and plate *d* were composed of copper, that is, they were cut out of daguerreotype plates—their faces were silvered.

Q. 119. How were they in the original and first tumbler instrument?

A. They were of tin plate; that is, sheet-iron tinned.

Q. 120. You have spoken of the rod F as a yoke and as rods; was it in one piece, or in more than one, and of what material was it?

A. It was in one piece; its material was brass.

Q. 121. Of what material was the little wire *d'*, that connected the rod F to the lower plate *d*?

A. It was of copper; I think it was copper.

Q. 122. What was its purpose?

A. For making an electric connection.

Q. 123. Of what material was the rod *e*, that connected the upper plate E to the diaphragm?

A. I don't want to be too positive; but I think it was copper.

Q. 124. Are you sure whether it was an electric conductor or not?

A. Yes, sir; I am sure of that fact—that it was an electric conductor. I thought that was understood.

Adjourned until December 9, 1881, at 10, A. M.

December 9, 1881, 10 *o'clock*, A. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Examination of D. Drawbaugh by Mr. Hill continued:

Q. 125. When this instrument, shown in the "Exhibit reproduced F drawing," was used, what were its electric connections—how was the circuit made through it?

A. Through one of the rods F, then through small wire *d'* to bottom plate *d*, then through low conductor G to upper plate E, then through wire rod *e* to diaphragm C, then through H wire.

Q. 126. Was this instrument used as a transmitter or receiver?

A. It was used as a transmitter.

Q. 127. Were all the different forms of the tumbler instrument used as transmitters or not?

A. Yes, sir; all the tumbler machines were used as transmitters.

Q. 128. Of what material was the diaphragm of the tumbler instrument composed, and if it was composed of different materials at different times, please state of what materials, so far as you remember.

A. To the best of my recollection, the diaphragm was composed of different materials at different times. In the original instrument I had used hog's bladder, or parchment, or something of that kind; and at other times I would use thin metals—as a general thing, tin when I used metals.

Q. 129. When you used the tumbler instruments as transmitters, did you use them in a continuously closed circuit, with a receiver and battery, the same as you used the old cup transmitter, or not?

[*Objected to by Mr. Storrow as leading.*]

A. Yes, sir; the same as I had used the old cup transmitter.

Q. 130. How did the purpose of low conductor G in the tumbler transmitters compare with the purpose of the low conductor in the old cup transmitter?—was it for the same or a different purpose, and to operate in the same or a different way?

[*Objected to by Mr. Storrow as leading.*]

A. It was for the same purpose and to operate in the same way; only in the tumbler transmitter I had made a good many changes of low conductors—and experiments. I used at different times different materials or compositions for that purpose.

Q. 131. State, so far as you recollect, the different changes that you made in the material or materials of the low conductor G, in the tumbler transmitter.

A. I made so many changes that it would be hard to enumerate them all. Some of them I can. I understand the question to relate to the tumbler transmitters. I don't remember whether I used earth in these. I ain't positive about that. In the former instrument—that is, in the cup—I had used earth. In this, or the tumbler instrument, I had used plumbago alone, and I had used plumbago mixed with other materials, that is, with carbons—and pulverized charcoal and plumbago; and at times, I had used charcoal alone; at other times finely divided coke and charcoal mixed, and also pulverized coke alone. I had used bronze—that is, finely divided metals—mixed with carbon or coke, and used various other materials that I can't think of.

Q. 132. Did you pulverize the bronze yourself, or procure it in a pulverized condition?

A. No, sir; I think not. I generally had that in the shop—bronze. You generally asked for brass bronze. It is sold in the shops by the name of bronze. There are two kinds, high and low bronze; low bronze is the best, but is a little higher in price. It comes in a pulverized state. It is a known article of commerce. There are quite a number of tints in the different kinds sold. I generally used the yellow kind—that is a good quality of brass, not tinted with other colors.

Q. 133. In these tumbler instruments, was the low conductor used in the form of a powder, or of a solid cake, or how?

A. As a powder; not always of the same degree of fineness, but generally as a powder.

Q. 134. You have testified that in your experiments with the cup transmitter you sometimes moistened the low conductor. Did you ever do anything of that kind with the tumbler transmitter or not?

A. Yes, sir; but in a different way. In the tumbler transmitter, the box or cup holding the low conductor did not extend to the bottom of the tumbler, but there was a space between the bottom of the box and that of the transmitter or tumbler. In that space I put water, which moistened the conductor—by that means moistened the low conductor.

Q. 135. How did the water communicate to the low conductor so as to moisten the low conductor? and did you always moisten the different kinds of low conductors to the same extent or not, in the tumbler instrument?

A. It took up water by evaporation—that is, the low conductor was moistened by evaporation. I did not always moisten the low conductor to the same extent. I had moistened it thoroughly—placed water so that it thoroughly saturated the low conductor in the box; but I found that would not answer. A number of times it occurred that it became that way by being tipped over—that the water got in that way accidentally, or by careless handling.

Q. 136. In both drawings, to wit: "Exhibit F drawing" and "Exhibit reproduced F drawing," there is represented within the glass walls of the tumbler, a lining which the draughtsman's reference tables state to be plaster-of-Paris lining. Were the tumblers of the tumbler transmitters lined with plaster-of-Paris?

A. Yes, sir; I believe I stated that before.

Q. 137. In the cap or cover, shown in "Exhibit F drawing," I observe a similar lining of plaster-of-Paris; but in the cap or cover of "Reproduced F drawing," I do not observe a plaster-of-Paris lining to the cap or cover. Did you use the cap or cover both with and without the plaster-of-Paris lining? Please state the facts in relation thereto.

A. I did; at different times I made different covers, and was in a hurry, perhaps, that I didn't take time to coat them with plaster-of-Paris; and discovered, too, that I didn't gain much good results by the plaster-of-Paris lining.

Q. 138. When you used the metal diaphragm on the tumbler transmitter, state whether the conducting rods F were, or were not, in electric contact with the diaphragm.

A. They were not.

Q. 139. How was the contact avoided?

A. By cutting away a portion of the diaphragm at the point where rods F passed through it. The diaphragm should have shown that.

Q. 140. Did the tumbler in which you placed water below the low conductor box have a bottom to it?

A. Yes, sir.

Q. 141. In "Exhibit F drawing," and in the machine "Exhibit F," I observe that the tumbler there shown has no bottom to it, the bottom having been broken off or removed. Did you have a tumbler instrument in which the tumbler had no bottom among your original tumbler instruments?

A. Yes, sir, I had; that is, after it became broken accidentally, I had still used it. I found that it would answer without having it dampened; that is, the later low conductor that I used could be used without being moistened—in a dry state.

Q. 142. Have you any recollection whether, in your tumbler transmitters, you always used the same identical tumbler, or whether you had different tumblers for the purpose?

A. I can't remember of using only the one; I may have used more.

Q. 143. In "Exhibit F," which is represented in "Exhibit F drawing," did you or did you not use a low conductor in the electric circuit?

A. I did; yes, sir.

Q. 144. It seems to have been lost from the machine, and is not shown in the drawing. Will you please describe where it was placed and how it was held in place, referring to the drawing, if you please, by way of illustration?

A. Yes, sir; there was a wooden box placed around the lower plate D, a box similar to D in "Exhibit reproduced F drawing." In that was placed the low conductor. Upper plate E was allowed to rest on the top of the low conductor. A wire *e*, now partly broken off, extended up and was secured to diaphragm, in a manner similar to rod *e*, in "Exhibit reproduced F drawing." Rod C passed up through the wooden cover B. Outside of cover B was a screw—I think, a thumbscrew nut—holding rod C in position.

Q. 145. In those tumbler instruments, and in the old cup transmitter, how was the central rod that extended from the diaphragm down to the plate which rested on the low conductor secured to the diaphragm, when the latter was made of bladder or parchment, or similar material?

A. There was a plate fastened to the diaphragm at about its center, and the rod was secured to that place.

Q. 146. When the diaphragm was made of metal, how was the rod secured to it?

A. It was directly attached to it by solder; I think, by solder; it was an electric connection; I am confident of that.

Q. 147. When using the tumbler transmitter in the form shown in "Exhibit F," and represented in "Exhibit F drawing," how were the line wires connected to the transmitter, and how did the circuit go through the instrument?

A. One of the line wires was attached to the rod C, the other line wire was attached to a wire that was attached or secured to the plate that was attached to the center of the diaphragm. I would state here, that that is to the best of my recollection. The current passed through rod C into plate D, through the low conductor; then to upper plate E; then into wire *e*, now broken off; through wire *e* to small plate secured to diaphragm; then through wire attached to said small plate to the line; either the zinc pole or the copper pole could be connected to rod C; it would make no difference which.

Q. 148. Did you have any idea or theory at that time as to the reason why the low conductor, when under pressure, would allow the electric current to pass more freely than when not under pressure? If so, what was your theory regarding it?

A. I think I had a theory or an idea. The conductor in a loose way wouldn't be in a condition to conduct as large a quantity of electricity as when compressed; it would resist more than when compressed.

Q. 149. Why?

A. The particles were further separated when loose.

Q. 150. Do you remember how you first obtained knowledge of that fact, that low conductors when under pressure would conduct the current more freely than when not under pressure—that is to say, did you learn it by reasoning it out and then testing it, or by accidental discovery, or by reading it somewhere, or by hearing it from some one, or how?

A. I don't remember how I came to it. I had been experimenting

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in that direction. I don't remember of getting at it by accident, either; don't remember of reading it; I don't remember of any one telling me of it. I don't suppose any one told me.

Q. 151. State whether or not you had at that time the acquaintance of many skilled electricians or scientific men.

A. I had not. I can't remember of having the acquaintance of even one.

Q. 152. Did you, or did you not, know at that time that the fact that conductors would pass the current more fully when under pressure than when not under pressure, was a fact unknown to the scientific world, and that its discovery was a new discovery?

A. I didn't know; it was a trial. I couldn't tell until I tried it. I didn't know whether it was a new discovery or not. I had no way of knowing whether it was a new discovery or not.

Q. 153. What books or printed works on the subject of electricity had you read or did you possess prior to your making the cup transmitter?

A. I had been reading the *Scientific American* at an early time. I had been a subscriber at a pretty early day, but don't remember of reading anything in it on that subject. I had some old school philosophies—Comstock's, I remember—but don't remember of reading anything on the subject;—on the subject of low conductors I have reference to.

Q. 154. My question referred to electricity generally. What printed works had you read on that subject prior to making the cup transmitter, so far as you remember?

A. So far as I can remember, as I stated before, I was a subscriber to the *Scientific American*, and may have read it in there; and I also had the philosophies—Comstock's, and I think, Parker's,—both old books—that is, I had them prior to that time.

Q. 155. Do you understand the French language, or can you read and understand books printed therein?

A. No, sir.

Recess for dinner until 2, P. M.

December 9, 1881, 2 *o'clock*, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Examination of Daniel Drawbaugh by Mr. Hill continued.

Q. 156. What receiver did you generally use in connection with the tumbler transmitter during the first year or two that you had the tumbler transmitter?

A. The instrument that I termed the tin can, "Exhibit B."

Q. 157. Did you use those instruments in the continuous electric circuit, as you have described, in connection with the cup transmitter, or not?

A. Yes, sir; I did.

Q. 158. What results did you get from such use?

A. True copies, if I may use the term, of different sounds made—that is, spoken words or musical tones.

Q. 159. Explain how you used to test them.

A. I used to place a clock or watch in the neighborhood of the transmitter and I would listen at the receiver—the tin can instrument. I also would have persons to speak into the transmitter, while I would listen at the receiver; and also I would speak into the transmitter while others listened at the receiver.

Q. 160. Where was this—in what building?

A. It was in the shop down at the creek—the one I now occupy.

Q. 161. Did you test the instrument with the tumbler transmitter and "Exhibit B" receiver in the same room, or in different rooms; and on the same floor, or on different floors of the shop or building?

A. I tested them on different floors and also in different rooms of the shop. I sometimes would have the transmitter in the cellar; that would be three floors or stories below where the receiver would be. I mean the third story below. I also tried them in different rooms; having the transmitter in one room and the receiver in the other, on the same floor. I also tried them with one floor between them, one in the part of the shop where we worked, and which we called the first story, and the other in the story next above that. Oftentimes I would have one instrument on the second story at one end of the shop, while the other instrument would be on the first story at the opposite end of the shop.

Q. 162. State whether you were or were not in the habit of testing the telephone with the receiver and transmitter so far apart, or so separated by partitions or floors, that the sounds which were made could be heard from the transmitter to the receiver only through the instruments. What was the fact about that?

A. I am positive that the sounds received or produced came through the instruments.

Q. 163. What was your object in putting the transmitter down in the cellar and the receiver on an upper floor, when testing and using the telephone?

A. For the reason of having greater distance between the two instruments; to be sure we did not hear the words, only through the instruments.

Q. 164. How were the line wires arranged and fastened between the different points at which you tested the two instruments—the transmitter and receiver?

A. In different ways at different times. I had them placed at so many different places that I can hardly enumerate all the different ways I had of having them fixed. I will try to describe some of the ways that I had. At one time I had the transmitter in a small room at the north-east corner of the shop—the corner on the Yellow Breeches, down stream. The transmitter was placed on a table; a battery was placed under the table, resting on a bench; the line wires passing up through the loft or garret floor, close to the east wall of the shop; the wires passed on the loft towards the south end of the shop, then down again through the floor to a window where was placed a receiver. At a time I had a large roll or coil of wire connected in the line, on the loft; there may have been two or three hundred feet or more of wire; I don't know exactly. At other times I had the transmitter in the south-east corner, or near the south-east corner; the line wires went from a bench or table that was in that end of the shop, to the ceiling of the same story; passed along that ceiling to the north end of the shop, then down through that story or floor to the story below. And then, at other times, I had the receiver in the cellar, the wires running up along the west wall of the shop to the third floor, or, as we term it, the second story. It is the third, including the cellar or basement floor. Then I had it connected to a ground wire and plate in the cellar. Another ground wire and plate, west of the shop, back of an old blacksmith shop, was placed in the water in the dam. The line wire from the cellar, at the east side of the cellar, ran up to the second story, passed through that story to the west side of the shop, then through that side, out over the top of the blacksmith shop, to the receiver. I wanted to get distance for transmitting by means of an earth circuit. I tried the transmitter, both in the cellar, at the east side of the shop, and the receiver back of the blacksmith shop; then, *vice versa.* The results were not very good with a ground line. I could not hear much; the ground connection was too short; there was not a sufficient quantity of earth. Short ground lines, you know, won't work as well as lines of a greater distance. I don't just remember of any other connection that I had. I had the instrument in so many different places in the shop that I can't remember all the places.

Q. 165. Did you understand my last question as asking for the ways in which you arranged the lines during the early days of your experiments with the tumbler transmitter and the receiver "B"? That is to say, during the first year or two of your experiments with those instruments.

A. I wasn't positive whether you meant only the tumbler. My understanding was that the question related to my earlier experiments, but I did not know it was limited to that particular transmitter and receiver. My answer did not relate to any particular period; say, about 1870 or 1871. I couldn't tell the letter of the instrument without seeing the drawings.

Q. 166. Please look over the drawings and see how the instrument is lettered that you refer to as in 1870 and 1871.

A. This is the instrument I referred to, marked "C."

[*Witness having looked over the drawings and selected the drawing marked "Exhibit C drawing."*]

Q. 167. Did you make the original instrument marked "C"?

A. Yes, sir.

Q. 168. Did you make it before or after you made the tumbler transmitter, "Exhibit F," and the tin box receiver, "Exhibit B"?

A. Yes, sir; I made it after.

Q. 169. George W. Drawbaugh, who has testified for defendants in this cause, has stated, on pages 623 and 624 [597 *and* 698] of Defendants' record, that in 1870 or 1871, he had knowledge of your talking-machine at a time when he was building a new wagon-box and repairing the running part of a wagon for Jacob M. Sadler, at which time he talked into it for you to listen, and you talked into it for him to listen. Have you any recollection of the circumstance of the repairs on that wagon at that time?

A. Yes, sir; I have.

Q. 170. Did you do anything on the wagon? If so, what?

A. Yes, sir; I done the striping and the lettering on the wagon. There was some painting or design representing a machine—a hydraulic ram—on the sides of the wagon. I did that.

Q. 171. Does that fact of your doing that painting on that wagon connect itself in any way in your memory with any particular telephone experiments that you were making at the time? If so, what?

A. Yes, sir; it does. I had this instrument "C" placed on a bench pretty close to where I was painting the wagon, and was conducting some experiments with it. There was no one in the shop at the time but myself. This instrument "C" was on the second story of the shop, where I was doing the work on the wagon. There was some one came into the door of the shop on the first story. I thought it might be Mr. Jacob Sadler. He was anxious to have his wagon finished. I thought he wouldn't be very well satisfied if he found me experimenting with this instrument. I shoved the instrument aside and covered it with something. When the person came up into the shop, I found it was not Mr. Sadler; it was a boy; the boy's name was Norman Kahney. While I was painting that wagon, Mr. Jacob Sadler came there very frequently—every day.

Q. 172. Do you remember what experiments you were making there alone on the instrument "C" at that time? If so, please state?

A. I can't exactly say. My experiments were so numerous that I don't just remember. I sometimes placed a clock and sometimes a watch at one instrument and listened at another instrument.

Q. 173. State whether you have or have not any recollection of experimenting with a galvanometer in connection with the instrument "C" and some other instrument, and studying the different effects.

A. Yes, sir; I have. I very often had a galvanometer in the line with different instruments—not only this, but other instruments. But I found that when a galvanometer was placed in a circuit with this instrument "C," the galvanometer was not deflected—not so much; it was hardly noticeable. I compared and tested "C" with the tumbler and with other later instruments in this respect.

Q. 174. At the time you painted Mr. Sadler's wagon, was the instrument "C" in a condition to transmit sounds or not?

A. Yes, sir; it was.

Q. 175. To the best of your recollection, how long had it been made at that time?

A. I couldn't be positive as to the length of time. It may have been made three, six, or nine months before, or perhaps a year. I don't remember.

Q. 176. Had you used the tumbler instrument "Exhibit F" and the tin box receiver "Exhibit B" for transmitting sounds before you made the instrument "C," or not?

A. Yes, sir.

Q. 177. To the best of your recollection, how long had you used hem before you made the instrument "C?"

A. I couldn't positively say how long, it may have been several years—two or three years. It might have perhaps been more.

Q. 178. During that time, and before you made instrument "C," what results had you been able to get with instruments "B" and "F?"

A. Sufficiently good to be heard distinctly; There were even words that were whispered. You couldn't just hear the words exactly, but could hear the whispering. I did that often. Spoken words you could hear—the whole sentences; I mean words spoken out loud, and not whispering merely. I would have persons in the cellar reading printed matter—some advertisement or something—and I could hear the words that were read; and at other times I would go down into the cellar and read something, and coming up they would repeat the words to me that I had read.

Adjourned until December 10th, 1881, at 10, A. M.

December 10, 1881, 10 *o'clock,* A. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Examination of Daniel Drawbaugh by Mr. Hill continued:

Q. 179. When you were using these two instruments "F" and "B," before you used "C," how did you have the line wires arranged?

A. I think I did not have that line running over the blacksmith-shop; I think not; I ain't positive. I had the other lines that I referred to.

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Q. 180. Please describe the instrument "C" as it originally existed.

A. It is the instrument which, in its present condition, is represented in "Exhibit C drawing." Referring to that drawing, A is a base-board; B an upright board or projection; C C are upright pieces supporting said projection.

Through B, at about its center, is an opening to admit the case of a hollow walnut chamber D; at the end where the letter D is marked, is a contracted opening for receiving sound.

At the opposite end from the contracted opening is a diaphragm indicated by letter G, on figure marked "section through body of instrument."

H, in same figure, represents an armature attached to the diaphragm. As the instrument originally existed, the little pin, marked *h*, was not there. The hollow chamber D was no longer in the original form of the instrument; it had within its body two thin membranes, the first of which was slipped on and held in place between these two pieces by friction [*indicating the body of the chamber D and the rim E,*] and the second was held in place by another wooden ring pressed down upon it, inside of the rim E; the rim E was originally longer than it now is, a part having been sawed off, about an inch long, which I now produce.

[*Mr. Hill offers in evidence the portion which has been sawed off, including the wooden ring for holding the second membrane, to be marked "Exhibit prolongation of rim E of instrument C."*]

The membranes extended entirely across the inside of the hollow chamber, and were intended as diaphragms. This sawed-off portion is not shown in the drawings.

There was a thin cord or string fastened to the center of the second diaphragm, which I have mentioned—the one which was held in the portion of this ring which has been cut off; the cord passed on through and was fastened to the other diaphragm at its center.

To the outer diaphragm was attached an armature; just immediately in front of that armature was an electro-magnet, which was in the circuit with the tumbler instrument "F," when originally made.

The inner diaphragm was pierced with several small holes; the holes were about a quarter, or perhaps a half inch in diameter, cut out of the membrane, between center of the membrane and the inner edge of the case. That was the diaphragm that did not have the armature attached to it, and it was the one which was next to the ear when listening

When the machine was originally made, it was intended to be a receiving instrument. At some period after that—I can't remember the length of time—I took off the bar that connects the two cores of the electro-magnet and held or placed a permanent magnet to the said cores and used it in that way; I then found that I could use it for a transmitter. Then at some period later than that again—I can't remember the length of time—I took and sawed off the end of the case and thus removed the part which has been put in evidence as "Exhibit prolongation of rim E of Exhibit C." I also removed the inner membrane, except the fragments that now remain. In its stead I placed a thin metal diaphragm, as shown in "Exhibit C drawing." The material of the diaphragm was German silver, and it was held in place by a tin ring. In the center of said diaphragm is secured the armature H, as shown in said drawing. In front of that was placed an electro-magnet, the poles being close to the armature, but not quite touching.

At the opposite end of the electro-magnet—that is, at the end usually having the bar or heel-piece—was placed a permanent U magnet; the poles of said permanent magnet were in contact with the cores of the electro-magnet. In that modification it was used as a transmitter, and also could be used as a receiver, but was more practically a transmitter.

Q. 181. As the instrument then existed, after you had made the modifications referred to in your last answer, did it, or did it not, contain the identical diaphragm G and case D E now contained in the instrument "C" which is before you on the table?

A. Yes, sir; and also the identical armature, but not the pin marked *h* in the drawings, and now on the armature.

[*Mr. Hill offers in evidence the instrument* "*C*," *to be marked* "*Exhibit C.*"]

Q. 182. When Mr. Knight made his drawings, he stated in his table of reference in "Exhibit C drawing," that the diaphragm was of tin. Did he make the drawings from this identical diaphragm, which is now on "Exhibit C?"

A. He did, to the best of my knowledge. His statement that the diaphragm was of tin was a mistake on his part.

Q. 183. The outer circumference of the sawed-off portion, which has been put in evidence as "Exhibit prolongation of rim E of instrument C," does not now seem to be quite as large as the portion of the rim E shown in "Exhibit C drawing." How do you account for that?

[*Witness, before answering, takes the case D and the sawed-off portion in his hand, and separates the rim E from the case D, and then slips the sawed-off portion on to the case D in place of the rim E; after which he places the rim E at the end of the case thus arranged; and then says:*]

A. I see I have reversed the way in which it was done. The arrangements that I stated before were correct as to the position in which the diaphragms were placed. But when I sawed the rim E in two—as it was originally—the outer portion sawed off, I then placed to the inner portion of the case, on the part marked D, and it is that piece which is marked E in "Exhibit C drawing." The intermediate part of the rim was removed, and it was that part which forms "Exhibit prolongation of rim E of instrument C."

The description in my answer one hundred and eightieth is correct, with this explanation.

Q. 184. As I understand your description of the completed instrument "C," it had a case with a mouth-piece, a German silver diaphragm with an armature attached at its center, an electro-magnet, the poles of which nearly, but not quite, touched the armature, and a permanent horse-shoe magnet, the poles of which were in contact with the cores of the electro-magnet at their heel end; and this instrument was used both as a transmitter and a receiver. Is my understanding correct?

A. Yes, sir.

Q. 185. How correctly is that instrument, when so constructed, represented in the drawing, "Reproduced C drawing?"

A. It is exactly the idea, with the exception that occurs to me that the permanent magnet is represented as a little larger than that on the original instrument; and the coils and core of the electro-magnet are shorter here in the drawing than in the original. That is to the best of my recollection.

Q. 186. At the time when you were painting Mr. Jacob M. Sadler's wagon, as you have testified, was the instrument then in the condition shown in "Exhibit reproduced C drawing," or was it in its earlier form?

A. I think it was in the form that is now here represented in the drawing; to the best of my recollection it was.

Q. 187. When you used that instrument as a receiver, in connection with "Exhibit F," as a transmitter, did you use them in the same kind of a closed electric current as you have heretofore described, as the circuit in which you used "Exhibit F" and the old cup transmitter?

A. Yes, sir; I always used them in a closed circuit.

Q. 188. What results did you get with the tumbler instrument as a transmitter and the instrument "C" as a receiver at that time?

A. Better results than I had in any former receiver.

Q. 189. Please state how you tested it to ascertain its results—how frequently, &c., and whether the two instruments "F" and "C" successfully transmitted and received spoken speech or not.

A. I tested it by having some one to speak or make some sounds in the tumbler instrument "F," while I would listen at instrument "C." I also placed or held the transmitter "F" in the neighborhood of a clock, while some one else would listen at "C" and hear the ticking of the clock. I distinctly heard spoken words through the instrument. I couldn't positively state how often—a great many times.

Q. 190. Did you hear whole sentences through the instrument as thus used or not?

A. Yes, sir; I often had persons to speak to me, and when they would come to me, I would repeat to them what words or sentences were spoken, and they would pronounce them correct.

Q. 191. Did you ever hear whole sentences that they spoke through these two instruments?

A. Yes, sir; though the instrument "C" was used more as a transmitter than a receiver—that is, with other instruments.

Q. 192. Did you hear spoken speech through those two instruments "F" and "C" when used together, at as early a time as when you were painting Mr. Sadler's wagon, or before that time, or not?

A. Yes, sir; before that time; but the exact length of time I couldn't state positively.

Q. 193. Is Mr. Sadler living or dead?

A. He is dead; he died about a year ago—nearly that, I guess.

Q. 194. Please look at the drawings marked "Exhibit I drawing" and "Exhibit reproduced I drawing, No. 1," and "Exhibit reproduced I drawing, No. 2," and state what they represent.

A. The "Exhibit reproduced I drawing, No. 1," represents an instrument made for a receiving instrument, and made by me.

"Exhibit reproduced I drawing, No. 2," represents a modification of the same instrument.

"Exhibit I drawing" represents the case of the original instrument.

Q. 195. When did you first have that original instrument, and for what transmitter was it specially made to be used as a receiver?

A. It was made after "C," but the length of time I couldn't possibly state; it may have been a year. It may have been made before Sadler's wagon was painted, and it may have been made after; I am not positive as to the time. It was used as a receiver in connection with instrument "C" as a transmitter. It was specially made to be used as a receiver with instrument "C" as a transmitter.

[*Mr. Hill puts in evidence instrument marked "I," to be designated as "Exhibit I," and states that the works inside of the case have been put in during the taking of the testimony for defendants in this cause; said works not being in the case at the time when the instrument was marked by the examiner for identification.*]

Q. 196. Please state whether the case and top or cover of "Exhibit I," are the identical case and cover originally used with the instrument "I," above referred to by you.

A. Yes, sir; the same case and cover.

Q. 197. Which form of the instrument was first made by you—the one shown in "Exhibit reproduced I drawing, No. 1," or the one shown in "Exhibit reproduced I drawing, No. 2"?

A. The one represented by "Reproduced I drawing, No. 1."

Recess for dinner until 2 o'clock, P. M.

December 10, 1881, 2 *o'clock*, P. M.

Examination resumed pursuant to adjournment.

Present same counsel except Mr. Smith.

Examination of Daniel Drawbaugh by Mr. Hill continued:

Q. 198. Will you please describe the instrument that is represented in "Reproduced I drawing, No. 1"—the older or original form of instrument—referring to the drawing, for letters of reference, if you prefer.

A. A represents the body of the instrument. The lower portion of the body of the instrument, not including the cover or top, is composed of two parts: the lower portion is a hollow or recessed cap; the portion above that would be a hollow cylinder with a flange at its lower edge fitting into a recess in the lower cap. At the upper edge of the hollow cylinder, there is a flange to fit a recess in the top cap-piece, or mouth-piece—as I am in the habit of calling it—for the purpose of holding the cap or mouth-piece in its place. At the upper edge of said cylinder there is a groove on the inside of said cylinder, for receiving the diaphragm. A space is left above the diaphragm for the reception of a paper gasket or ring. In the center of said diaphragm is secured by a screw, an armature, on the under side of the diaphragm. At the bottom of the lower cap-piece is secured an electro-magnet, by a screw fastening into the heel-piece of said magnet, the cores of said magnet coming into close proximity to said armature.

The extremity of wires of electro-magnet pass out of two holes made through the sides of the cylindrical piece above mentioned, and are held in position by two wooden plugs.

In the instrument, when originally made, those holes in the side were provided with screw-posts, where now the wooden plugs are.

Q. 199. In all the telephones that you ever made, from first to last, what kind of a circuit was used—closed or open?

A. A closed circuit, always.

Q. 200. In all the telephones that you ever made, from first to last, was the armature of the diaphragm in contact with the poles of the electro-magnet or not? Or was it intended to be so near the poles of the electro-magnet as to touch said poles when vibrating or not?

A. No, sir; they were not intended to be so close as to touch when vibrating.

Q. 201. Referring now again to the original instrument "I," as you have described it, and as it is shown in "Exhibit reproduced I drawing, No. 1," I understand you that this instrument was used as a receiver with "C" as a transmitter. Am I correct?

A. Yes, sir.

Q. 202. When you used the two instruments "C" and "I" together in that way, what results did you get and how satisfactory were they?

A. I heard words spoken through the instrument and understood what was said through the instruments. I heard sounds of different kinds made through the instruments, and could hear distinctly the different kinds of sounds through them. The results, as I remember now, were satisfactory, and better than the results with the tumbler and "C." I am confident that it was better than the original tumbler and "C" instrument.

Q. 203. How did the results, when using "C" and "I" together, compare with the results when using "F" and "B" together?

A. When using "I" and "C" together, it was much more satisfactory—louder—entirely better.

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Q. 204. Was the instrument "C" the first magneto transmitter which you ever made?

A. Yes, sir; to the best of my recollection, it was.

Q. 205. If I understand you, you invented the carbon transmitter first, and invented the magneto transmitter secondly, or as an improvement upon the original invention. Am I correct in that?

A. Yes, sir.

Q. 206. Did you test the two instruments "C" and "I" together, in the same way as you had tested "F" and "B," or "F" and "C"—that is, on similar lines or circuits, and with as great variety of experiments or tests at that early period to which you have been referring?

A. Yes, sir; to the best of my recollection, I did.

Q. 207. You have stated that the instrument illustrated in "Exhibit reproduced I drawing, No. 2," was a modification of the original instrument "I." Please describe in what the modification consisted.

A. The modification consisted in applying a double permanent magnet to the heel of the electro-magnet, instead of the heel-bar.

Q. 208. How did the instrument operate, and what was it used for, after the modification had been made in its construction?

A. It was a better instrument. It answered better as a receiver, and it could be used as a transmitter, and I have used it as such.

Q. 209. How long was it after the original instrument "I" was made before you made that modification?

A. I could hardly say. It may have been a month or several months. It may have been six months or perhaps a year. I can't get at it very clearly.

Q. 210. Have you any recollection whether that modification was made before or after the Haucks purchased the faucet business, in July, 1873?

A. I believe it was before.

Q. 211. The original instrument "I" and the modification which you have described both contain a top cover or mouth-piece of considerable height above the diaphragm. Did you ever modify the shape or height of that top cover? If so, how?

A. Yes, sir; I did. I made another, much lower from the opening or mouth-piece—that is, the mouth-piece was closer to the diaphragm—less space inside, than was in the older cover or mouth-piece.

Q. 212. Please look at the mouth-piece which I now put in evidence, and state whether it is or is not the identical modified mouth-piece and cover to which you refer.

A. It is.

[*The examiner marks said mouth-piece and cover "Exhibit 1 modified mouth piece."*].

Adjourned until December 12, 1881, at 2, P. M.

December 12, 1881, 2 *o'clock*, P. M.

Examination resumed pursuant to adjournment.

Present, Mr. Hill and Mr. Jacobs for respondents, and Mr. Storrow for complainants.

Examination of Daniel Drawbaugh by Mr. Hill continued:

Q. 213. Have you any recollection when you modified the shape of the cover or mouth-piece, by making it lower, like "Exhibit modified mouth-piece," or how long was it after you made the original instrument "I?"

A. I do not recollect; in working on those modifications or changes, I did not charge my memory with the time. I cannot give the length of time.

Q. 214. What was your object in making the mouth-piece lower than it had been before?

A. I suppose it was on account of some other modifications that I had made in some instruments before; in reducing the space between the mouth-piece and the diaphragm, I thought I got better sounds; that is, I thought it gave better results.

Q. 215. In what instrument before?

A. I had made modifications in the tumbler instrument; that is, I had made the space smaller between the mouth-piece and diaphragm, and also in instrument "C"; but in them I did not come down to the extreme change, as I did in this, [*referring to "Exhibit modified mouth-piece."*]

Q. 216. Are the electro-magnets now in "Exhibit I" the same that were formerly used there, in the instrument, when you were operating it?

A. I think so; that is, in making search for the magnet—there were a number around the shop there, and this one exactly fit the recess provided for the bar, in the bottom of the box, and the cores were of the right length — suited to the armature of the diaphragm.

Q. 217. In the modification shown in "Exhibit reproduced I drawing, No. 2," how were the poles of the permanent magnets arranged?

A. There were two horse-shoe magnets, their ends or poles were halved, and their poles placed together; that is, south pole of one was placed to south pole on the other. The electro-magnets were placed, one to each compound pole, secured by a screw through the permanent magnets into the cores of the electro-magnets.

Q. 218. Originally you seem to have used plaster-of-Paris lining to the cover of instrument "I." Was that continued after the modified cover, here in evidence, was applied or not?

A. No, sir, it was not. I discovered, at a time, that it did not amount to much; I could not see that it was much benefit to the instrument.

Q. 219. The drawing "Exhibit reproduced I drawing, No. 1," shows a diaphragm with four holes in it. Was that the way you made and used your diaphragm in that instrument?

A. I think that was the way I made it in the former stage of the machines I had—that is, in a number of instruments.

Q. 220. How did that work?

A. I don't think there was any gain by having it in that way. I don't remember of noticing any difference.

Q. 221. In instrument "C," the diaphragm appears to have been corrugated concentrically. Is that the fact, that it was so made and so used at the time when the metal diaphragm was used on said machine originally?

A. No, sir; I don't think it was just immediately; that was an experiment. I found in former machines it was necessary to dampen them by pressure, and the corrugations would give it more stability—make them more rigid; but I don't suppose I used the diaphragm long till I did make the changes.

Q 222. Did you find that the corrugation of the diaphragm was of any practical benefit or not?

A. It was, in this diaphragm, I think.

Q. 223. Was this particular diaphragm made of exceedingly thin metal?

A. Yes, sir; it was termed plating—material used for covering iron by plating; it was much thinner than tin.

Q. 224. Please look at the instrument that I now put in evidence, to be marked "Exhibit A," and state what it is and who made it.

A. It is a telephone receiver. I made it.

Q. 225. Was that made before or after "Exhibit C" and "Exhibit I," about which you have testified?

A. It was made after them.

Q. 226. Is this instrument, which is now put in evidence, in exactly the same form in which it was originally made by you?

A. No, sir, it is not. In its original state the mouth-piece was in the center. There was no screw in its center, as this one now has alongside of the mouth-piece.

Q. 227. How long do you think the instrument was in that original state, with the mouth-piece in the center, before you changed it by putting the mouth-piece at one side of the center?

A. I could hardly tell how long I used it in that way. It might have been a year, or it might have been two or three months; I can't tell the right time.

Q. 228. Why did you change the mouth-piece to the side and put the screw at the middle?

A. I did that for the purpose of making it more rigid. It seemed too flimsy—vibrated too easily, or produced jars, I might say. I mean, make the diaphragm more rigid; in that change I placed in the center of the diaphragm a piece of soft rubber. The brass screw that runs through the center of the upper lid rested on the upper side of that rubber, the mouth-piece was changed to one side to accommodate the screw.

Q. 229. Did you find that this rubber pad and dampening screw benefitted the instrument or not?

A. I thought it did at the time benefit it to some extent.

Q. 230. What transmitter did you use this instrument "Exhibit A" with, when you first had it in the present form with the mouth-piece at one side, and before that time?

A. I used it with both these instruments, "C" and the tumbler instrument, "F." The best results were with the tumbler.

Q. 231. What use did you make of the instrument "Exhibit A?" What was done with it and how satisfactorily did it work?

A. I thought then it was a pretty good instrument; though it wasn't as good as that instrument there, [*indicating* "*I*"] in its modified form with the permanent magnets--wasn't as loud. I used it as a receiver. I couldn't enumerate all the different sounds I made through it. I made all the sounds through it that I could think of. I whistled, sang and talked through it; and I remember, too, I got a party to play a jew's-harp and I heard that through it distinctly.

Q. 232. Was it used on the line wires that you had up in the shop there, with a transmitter in some other part of the shop, or on some other floor or not?

A. Yes, sir; it was used on different lines that I had in the shop with transmitters. The transmitters were in different places; in the cellar and in different rooms upstairs. There were transmitters in different rooms upstairs at different times, and the instrument "A" down-stairs in the story below.

Q. 233. When talking through the instrument, how satisfactorily did it operate? State how clearly you could hear; whether you could hear a whole conversation, or extended remarks or not.

A. I could distinctly hear all words spoken; often whole sentences.

Q. 234. Could you hear whatever was talked into the instrument or not?

[*Objected to by Mr. Storrow as leading.*]

A. Yes, sir, I could. As far as I can remember, I thought it satisfactory—good, as near as I can remember.

Q. 235. Did you talk to a good many different people through this instrument "A," or not?

A. Yes, sir; I did.

Q. 236. After you put in the central dampening screw and changed the mouth-piece or ear-piece to one side of the center, did you ever make any further changes in the construction of this instrument "A" or not?

A. I do not remember of any other changes.

Q. 237. Was that the only change you made in the instrument "A" after it was first made--that putting in of the central screw and moving the ear-piece to one side?

A. I think I made some changes in the diaphragm; that is, in the way of thickness. I was in the habit of changing the diaphragms in all the instruments. That is all the change I can remember.

Q. 238. The mouth-piece was changed to one side at the same time when the central dampening screw was put in, was it?

A. Yes, sir; I moved the mouth-piece for the purpose of getting room for the screw.

Q. 239. Please describe the construction of the instrument "A" as it was when you had it fully completed and perfected; and you may refer to "Exhibit A drawing," by way of illustration, if you choose.

A. A on the drawings represents a hollow circular chamber. At the upper edge of the opening, there is a hollow recess for the reception of a thin wooden diaphragm C, which is kept in place by an upper cap B, secured by brass screws.

On the outside of the circular chamber A is secured a curved brass bracket F, secured to the back of the instrument by screws *f*.

Towards the opposite end of the bracket is fastened to it the electro-magnet D by a screw f^2; said electro-magnet passes through an opening in the back of the instrument or case A.

On the center of the under side of the diaphragm is secured an armature of soft iron *d*, which is immediately above the poles of said magnet, not quite touching them.

Through the cover B passes a brass screw B′, which comes in contact with a piece of soft rubber, placed on the center of the diaphragm on its upper side; said cover is provided with a mouth-piece or ear-piece I.

H H are two binding posts secured to and passing through the case A. The large screw G is for adjusting the electro-magnet closer to or farther from the armature.

The current passes into one of the screw posts; then to one end of the conducting wires; thence around the cores; then to the opposite end of the wire of coils, to the other of the binding posts H.

Q. 240. I observe that a small portion of the spool in the machine, "Exhibit A," has been broken off and lost. State whether this breaking has recently occurred, since the taking of testimony in this case.

A. Yes, sir. I think there was a small portion broken off before, but not as large a piece. I think the larger piece was broken off since.

Q. 241. Can you fix the time when you first made this instrument "A" or when you first put the mouth-piece at one side of the center?

A. I cannot possibly say. I know it was after I made this instrument, [*indicating* "*Exhibit C*,"] but the length of time between those two I couldn't possibly give. I can't remember the length of time.

Q. 242. Mr. Jeremiah Kohler, a witness who has been examined for the defense in this case, testifies positively, on page 567 [544] of defendants' printed record, that he saw you working at and making this machine, "Exhibit A," some time between April, 1873, and April, 1874. State whether there is or is not anything within your knowledge that would lead you to doubt the accuracy of Mr. Kohler's statement.

[*Objected to as incompetent.*]

A. There is not—nothing that would lead me to doubt the statement. It may be that I made it as early as then; I cannot recollect.

[*Counsel for Defendants offer instruments "D" and "E" in evidence, to be marked "Exhibit D" and "Exhibit E," respectively.*]

Q. 243. Please look at these two instruments which I have just put in evidence, and state who made them, or under whose direction they were made?

A. They were made under my directions. Part of them I made and parts of them were made by Harman K. Drawbaugh.

Q. 244. Please explain the construction and mode of operation of the instrument "Exhibit D," referring, if you choose, to "Exhibit D drawing," by way of illustration.

A. It is composed of a wooden casing A and cap B, with mouthpiece B′ in the cap.

An electro-magnet C, and a permanent magnet D, one of the poles of which is secured to heel of electro-magnet.

Said electro-magnet consists of a single core and coil, and passes through an opening in the center of body A of instrument.

In a recess, at the inner upper edge of A, is placed a diaphragm G. Said diaphragm is held in place by the cap B, which fits a recess at the outer and upper edge of body A.

The core of the magnet is bored out for the reception of soft iron plugs, *c′* and E. The plug *c′* is attached to a small screw F, which passes through the plug E, at the heel of the electro-magnet, for the purpose of adjusting said plug *c′* closer to and farther from diaphragm G. There is a small jamming nut *e* for the purpose of holding screw F to its place when rightly adjusted.

Q. 245. Do you remember which of those two instruments, "D" and "E," was made first?

A. I don't know which. There was one of them made first, but which one I couldn't tell; they are so nearly alike.

Q. 246. Were they made before or after instrument "A"?

A. They were made after instrument "A."

Q. 247. Did the instrument "D" ever have a bottom cover or cap covering the permanent magnet, the same as "E" has?

A. Yes, sir.

Q. 248. What was the instrument "D" used for—transmitting or receiving?

A. It was used for both transmitting and receiving, but it was used first as a receiver, in connection with these other transmitters.

Q. 249. Did it have the permanent magnet when it was first made?

A. Yes, sir; it was a modification of the instruments that had been made before that.

Q. 250. Please describe the instrument "Exhibit E," referring to "Exhibit E drawing," by way of illustration, if you choose.

A. It is similar to "Exhibit D" in all respects, with the exception of the bottom cap C.

Q. 251. Did the original instrument "Exhibit E," or did it not, contain an adjustable plug and adjusting-screw therefor, corresponding to the adjustable plug *c′*, and its adjusting-screw F, in "Exhibit D" and "Exhibit D drawing?"

A. Yes, sir; it did.

Q. 252. What became of that plug and adjusting-screw of instrument "E?"

A. I can't say. It was lost in some way—became detached and was lost, I guess.

Q. 253. Were both these instruments, "D" and "E," used as transmitters and receivers in their early days?

A. Yes, sir; they were used together, one as a receiver and the other as a transmitter, and they were used with carbon transmitters, both as receivers.

Q. 254. With the exception of the removal or loss of the little plug *c′*, and its adjusting screw F, in "Exhibit E," and the removal or loss of the rear cap or cover of "Exhibit D," are these two instruments, "D" and "E," in the same condition as when they were first made, or not; and if not, what difference?

A. They are, to the best of my knowledge, except that, at a time afterwards, I made a little change in the body A of instrument "D." There is a recess in instrument "D" immediately below the diaphragm, around the upper edge of the coil of the electro-magnet which was cut in some time after the instrument was first made; with that exception, it is the same.

Adjourned until December 13th, 1881, at 10, A. M.

December 13, 1881, 10 *o'clock*, A. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Examination of Daniel Drawbaugh by Mr. Hill continued:

Q. 255. What was your object in making that recess?

A. Intended for a trial to see whether it would be an improvement. It occurred to me that it would give more space for vibration of diaphragm; that is, it would allow more elasticity for the air.

Q. 256. What was the result of putting that space in there? What effect had it on the operation of the instrument?

A. I don't think there was any improvement; that is, there was no perceptible difference between the two machines after trying it. I mean the two magneto instruments, "D" and "E."

Q. 257. In the two instruments "D" and "E," as they are at present, the cores and electro-magnets and permanent magnets are all somewhat loose, so as to slip in and out unless carefully handled. Was that so originally, or is it the result of wear and rough usage?

[*Objected to by Mr. Storrow as leading.*]

A. It was not so originally. They became so by careless handling.

Q. 258. State whether or not the handling during the taking of testimony in this case has increased that looseness.

A. Yes, sir.

Q. 259. To what extent did you use the instruments "D" and "E?"

A. I used them very often. I couldn't state how often.

Q. 260. Did anybody talk through them or listen through them besides yourself?

A. Yes, sir; a great many persons. What I mean by that is, a great many persons who come to the shop there.

Q. 261. How satisfactorily did these two instruments work?

A. I considered they worked well. Persons listening could hear all that was spoken through them.

Q. 262. How far were they tried apart?

A. I tried them on different lines in the shop—about the same as I did the former instruments.

Q. 263. Referring now to your magneto transmitters, "C," "I," "D," and "E," how did you use them—with a battery or without, when transmitting by them?

A. Without a battery, when using for transmitting.

Q. 264. Did you ever try them with a battery?

A. Yes, sir; I did.

Q. 265. Mr. Harman K. Drawbaugh, a witness heretofore examined for Defendants, has testified, on page 579 [555] of defendant's printed record, that these instruments "D" and "E" were made in January or February, 1875, before the Axle Company received its new machinery in March, 1875. Have you any recollection of the fact or not?

[*Objected to by Mr. Storrow as leading and incompetent.*]

A. I have no recollection of the time, but I recollect of him working on the machine; one of them was made before that time. What I mean is, there was one of them made, and Harman made, or helped to make, the other. It has been quite a long time ago. I can't remember the year or date of it.

Q. 266. Have you any recollection of putting a line of wire up from the third floor to the garret or fourth floor, and winding it back and forward on the garret several times, from one end of the building to the other, to gain length or distance, and then taking it down to the cellar and using those two instruments "D" and "E" upon it?

[*Objected to as leading.*]

A. I remember of having a line from the cellar to the garret. I don't remember just in what way I had it arranged on the garret; at different times I had coils of wire in the garret. I may have run it back and forward with those coils; that was at a pretty early period. I had lines arranged in so many different places in the shop that I can't remember every particular arrangement. When I say coils of wire I mean rolls of wire. I do not mean coils for a magnet.

Q. 267. Please look at the instrument "H," which I now put in evidence, to be marked "Exhibit H," and state what it is and who made it?

A. It is a telephone transmitter. I made parts of it; parts may have been made by some other parties; I don't remember who, but I

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often had George W. Drawbaugh to help me make some of the instruments.

Q. 268. Do you recollect when this instrument was made so as to fix the time?

A. Not positively. I don't know any date particularly.

Q. 269. Several witnesses have testified to seeing this machine either completed or in process of completion in the fall of 1876. What is your recollection as to that fact?

[*Objected to by Mr. Storrow as leading and incompetent.*]

A. The time elapsed—just judging the time, it may be at that time, or before. I had been making a good many of them. I paid no attention to the time. It has slipped my memory.

Q. 270. Please explain the construction of the original instrument "H," referring to the drawings "Exhibit H drawing, sheet 1," "Exhibit H drawing, sheet 2," and "Exhibit H drawing, sheet 3," by way of illustration.

A. A represents a wooden box and B is the door; on the inside of the door is a cast-iron open ring D; on the inner edge of the ring is a circular groove; in said grooves is placed a sheet-iron diaphragm F.

The diaphragm is held in place by a gasket f, of paper or gum, I don't remember which; on that is placed a brass ring f', to secure and hold both the diaphragm and gasket to their place.

At the upper side of cast-iron ring is secured a brass bracket. At the upper end of said bracket is placed a wooden block g', used as an insulator.

At the outer side of block g' is placed a brass spring D', which is screwed to the brass bracket by two screws g^2, passing through the brass spring and the wooden block and into the bracket.

The screws g^2 are insulated from D' by hard rubber rings or washers, g^3.

About the center of the brass spring D' is an opening through said spring and directly opposite the center of the diaphragm. A little way above the center of said spring is secured another thin brass spring D^2 by a screw d.

At the lower end of said thin spring D^2 is secured a brass cup d^2, by means of a screw, said cup containing a carbon block or ball d^3.

Immediately opposite said carbon block and brass cup is a wooden tube I^2, secured to a brass spring E about centrally between brass spring D′ and diaphragm, said spring extending out past metal ring D, and secured to the lid or cover of the box by a screw *e′* passing through a small wooden block *e*.

On the center of the diaphragm is another brass cup I, which contains another carbon block I′.

In the before-mentioned wooden tube I^2 were carbon blocks placed. At different times I changed the number of blocks in said tube; sometimes I had one, at other times two, three, or four; I can't remember the exact number. At the lower end of spring D′ is placed a brass milled head-screw H, the thread on the end of which is fitted to the cast-iron ring D. Said screw was for the purpose of adjusting spring D′ closer to and farther from the diaphragm, and thus compressing more or less the carbon blocks.

A conducting wire *h′* is secured to the diaphragm by solder, close to brass cup I, which is carried on the diaphragm. Said wire passed to one end of the primary wire of the induction coil J; then passed out or from the other end of primary of induction coil to a binding post on top of instrument to the right of the bell. This binding post is not on the instrument now.

Another conducting wire is secured to the upper end of spring D′ by means of solder, then passes to another binding post at upper left-hand side of the case, near the top. This binding post is also now removed.

The secondary helix of the induction coil is connected as follows: One end to one of the binding posts K^3 and the other to the other of the binding posts K^3.

Each of said binding posts was provided with two binding screws for securing two wires to each post; one wire was for the line wire and the other was for the receiver.

There was an alarm mechanism upon this instrument.

A brass screw L was for securing one end of a switch lever; said lever extending down some distance to either of two brass plugs L^2.

When resting against one of those plugs, the primary current passed or was conducted through the line wire, for the purpose of signaling the opposite end of the line. When switched on the other, the primary circuit passed through the carbons.

On the inside of case, near the upper left-hand corner, was secured an electro-magnet by a brass plate L^3, by means of a brass screw *l*. The electro-magnet is now missing.

In front of said electro-magnet, close to its poles, is secured a soft iron armature M, by means of a brass plate pivoted at *m*.

At the upper end of armature was secured a brass rod, at the upper end of which was secured a small metal hammer, which is now missing.

At the side of it was a gong-bell C, upon which it was to strike.

Said bell was secured to a wooden bracket C′.

A spring G secured wooden block G′. Said block was fastened to cover or door; I think it was glued on. Said spring rested against the diaphragm between the center and the outer edge. Originally this spring was of brass, and a conducting wire *h′* was secured to the lower end of said spring and used as a conductor between the diaphragm and the primary of the induction coil. That was the original construction, and in that way it answered the two purposes of a dampening spring and a conductor.

Recess for dinner, until 2 o'clock, P. M.

December 13, 1881, 2 *o'clock*, P. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Examination of Mr. Daniel Drawbaugh by Mr. Hill continued:

Q. 271. Did you ever use this instrument "H" for talking through a telephone line at your shop? If so, to what extent?

A. I did, on various lines; that is, through various portions of the shop; from the cellar to the second story; to different rooms in the shop. I used it also to a line that I put up, that extended down the Yellow Breeches creek.

Q. 272. How did the instrument "H" work? What degree of satisfaction did it give?

A. It worked very well; much better than some others that I had; better than any other that I had prior to that time.

Q. 273. How long was your line that you established down by the creek?

A. I would judge it to be in the neighborhood of a hundred yards—may be more, may be less; I would suppose it to be more.

Q. 274. Did you talk through the instrument "H" to others, or have others talk through it to you?

A. Yes, sir; I have talked to others, and others have talked to me.

Q. 275. What receivers did you use with it, when talking or listening?

A. All the receivers that I had previous to that.

Q. 276. How plainly could you hear and understand, through the receivers, what was spoken at the other end of the line "H"?

A. I could understand very distinctly everything that was spoken through the transmitter "H."

Q. 277. Has this instrument "H" been altered any since it was first made or not?

A. It has, to some extent; the bell was put on some time after it was first used, and there were changes in diaphragms. Some time after it was made I had a corrugated diaphragm, I know. I don't remember the number of different diaphragms. There was also a change in the dampening spring. It was first of brass, and then changed to steel.

Q. 278. Have you any idea how long the bell was put on after the instrument was otherwise finished?

A. I don't remember the length of time. It may have been some months, perhaps.

Q. 279. What difference did the changes of the diaphragm make in the working of the instrument?

A. I remember the first diaphragms were thinner, and after replacing with a thicker diaphragm, it worked better--considerably better, as near as I can remember now.

Q. 280. How long before you replaced it with a thicker diaphragm?

A. I couldn't state how long. I made some changes in the diaphragm shortly after I made the machine.

Q. 281. How did the change in the dampening spring and the electric wire, which was attached to it, affect the operation of the instrument, if at all?

A. I don't know that it was any particular change in the effect. I made that change for the purpose of getting a metallic connection; that is, the other spring, resting on the diaphragm, would oxidize, and it occurred to me that that might lessen part of the current.

Q. 282. In this instrument "H," could you adjust the carbons to such a degree of contact pressure as to fulfill all the requirements of the instrument for a transmitter or not?

A. Yes, sir.

Q. 283. What kind of carbons did you use in the instrument?

A. I generally used carbon that I got out of the bottom of gas retorts, where the carbon accumulates. I got it at Harrisburg; just lying in the yard—just picked it up. I also used others, cut out of coke, but found that had a tendency to wear away, being too soft. I also made carbons out of charcoal myself, which, to the best of my recollection, I used. I pulverized charcoal and made it into a thick paste and compressed it; then covered it with a mortar of clay and heated it in the fire to a white heat. These carbons varied in hardness.

Q. 284. What kind of carbon did you first use on this instrument "H?"

A. To the best of my recollection, the softer carbons, made of coke.

Q. 285. Did you find these softer coke carbons wear out?

A. I can't just say that they wore out; they wore off. I can't just say I discarded them for that reason. I found the harder carbons answered a better purpose.

Q. 286. Was this the first telephone that you ever made with an alarm bell on top of it?

A. Yes, sir; I think it is.

Q. 287. Have you ever made one with an alarm bell since you made this?

A. Yes, sir; several.

Q. 288. When did you make those several—some time ago, or recently?

[*Objected to by Mr. Storrow as leading and incompetent.*]

A. Within the space of two years, as near as I can recollect.

Q. 289. This instrument contains an induction coil. Did you ever use an induction coil in connection with your telephones before you made this instrument "H?"

A. I did, but they were not connected with the instrument. That is, I tried them with other instruments, but the coils were lying loose upon the table. The primary current passed through the coil and the secondary to the line. If I am not mistaken, this same coil had been used in just that way, before it was placed in this box, [*referring to induction coil in instrument* "*H.*"]

Q. 290. Have you any idea how long you had so tried the induction coil, before you made this instrument "H?"

A. I could hardly state how long. It might have been two, three, four, five or six months; maybe more.

Q. 291. Do you remember what instrument or instruments you tried it with before you made "H"?

A. Yes, sir; but I can't designate the instruments without seeing them.

[*Witness looks through the photo-lithographs, and then pointing to figures of instruments "L" and "M," continues his answer.*]

Those are the ones.

[*Defendants' counsel put the instruments "L" and "M" in evidence, to be marked "Exhibit L" and "Exhibit M."*]

Q. 292. Please look at the drawings marked "Exhibit reproduced L drawing" and "Exhibit reproduced M drawing," and state whether they are or are not correct drawings of those two instruments, as they were originally made?

[*Objected to by Mr. Storrow as leading and incompetent.*]

A. Yes, sir; they are, as near as I can judge from the drawings.

Q. 293. Were those instruments "L" and "M" made before instrument "H"?

A. Yes, sir.

Q. 294. How long before?

A. I could hardly state that; it may have been six months; I don't know—may be more. About that time I was making different ones, and I don't remember the time that elapsed between them.

Q. 295. Were these instruments "L" and "M" made before or after the little magneto-instruments "D" and "E"?

A. After, to the best of my recollection.

[*Mr. Hill offers the instruments "G" and "O" in evidence, to be marked "Exhibit G" and "Exhibit O," respectively.*]

Q. 296. What are these two instruments "G" and "O," and who made them?

A. They are transmitting instruments. I made them.

Q. 297. Were these two instruments "G" and "O," or either of them, made before instrument "H" was made, or not till after?

A. They were made after the instruments "L" and "M." I think, to the best of my recollection, that they were made before "Exhibit H," but I won't be positive about that; there were so many that I have lost the exact order. I am positive that they were made after "L" and "M."

Q. 298. Who made "L" and "M," and what were they intended to be used for?

A. I made them; to be used as transmitters and also as receivers.

Q. 299. Did you ever use them together, one as a transmitter and the other as a receiver?

A. Yes, sir.

Q. 300. What other instruments that you have testified about did you ever use them with, or either of them?

A. I suppose I have used them with all prior instruments; I mean all instruments that could be used. They were intended to be used together, one as a transmitter and the other as receiver. In that way, I suppose, they were used the most.

Q. 301. How did they work?

A. They worked very well.

Q. 302. Did you ever talk through them, or hear anybody talk through them?

A. Yes, sir; often.

Q. 303. Could you hear and understand everything that was said through them or not?

A. Yes, sir; to the best of my recollection, I could.

Q. 304. Did others hear and understand what you said through them?

[*Objected to by Mr. Storrow as hearsay.*]

A. Yes, sir; I believe so. I spoke to others through them, and was answered back through them; for that reason I believe so.

Q. 305. Please describe the instrument "M" as it was originally constructed by you, using the drawings by way of illustration.

A. There are some parts not here; I will go and get them.

[*Witness returns with box of loose parts of instruments.*]

The original instrument "M" is shown in "Exhibit reproduced M drawing."

A represents the casing or body of the instrument; B a cover or cap of the instrument; D represents the electro-magnet; F represents the heel-bar of the electro-magnet.

In the center of the heel-bar, there was an opening for the reception of a tin tube. Said heel-bar was secured to the heels of the cores of the electro-magnet by screws.

At the top of casing A, on the inner edge, is a shallow recess for the reception of the diaphragm C.

To the center of the diaphragm is secured an armature I, by means of a brass screw, said screw being recessed on its under side for the reception of a brass rod.

At the bottom of said brass rod is attached a thin copper plate e^2, which fits inside of a wooden tube E, said tube fitting loosely inside of a tin tube, which served as a guide or holder. In one instrument there were a couple of small tin pieces serving as guides instead of tin tube.

In the wooden tube before mentioned, at its bottom, was another copper plate. Between bottom plate and top plate were placed carbon balls *e e e*.

To the center of the bottom copper plate is secured a conducting wire, which was bent over to the side at the bottom of the tube and extended out a little way, and played in the vertical slot in the side of the tin tub, which slot was made to accommodate the conducting wire; thence to one of the binding posts H.

Another conducting wire was secured to the under side of the diaphragm and extended to another of the binding posts H.

The current passed as follows: One end of one of the coils of the electro-magnet was connected to one of the posts H; the other end of that coil was connected to the next coil. The other end of that second coil was connected to the conducting wire, which was attached to the bottom copper plate e'.

Attached to the rod of the upper plate is a conducting wire secured thereto, and passing to the other binding post H.

G is a screw recessed in its center for the reception of a spring—either a spiral spring or a piece of soft rubber; I don't remember whether the spring or the rubber was the original form. Said spring rested against the under end of the wooden tube E, and was capable of pressing more or less against the tube by means of the adjusting screw G.

The spring is shown as a rubber block *g* in the drawings.

The construction of original instrument "L" was similar, with the exception of the dampening spring I, which is shown in the drawing.

I have described two kinds of connections, but it was intended that the current should pass through the carbons and through the coils.

I have made a good many modifications of these machines and changes of diaphragms. In some of them, the conducting wire was attached to the diaphragm, as I have above described. In all cases the current went through the coils; in the instance above, where I omitted to mention them, I ought to have put them in; there was a number ot modifications and experiments.

At one time afterwards I changed the carbon balls. I took this whole carbon business off, and put on two permanent magnets, allowing the same space between the electro-magnets.

And then, in one of the instruments, I took away the tube and balls and put a post in their place, which post passed up to the top to the diaphragm, and the center of the diaphragm was secured rigidly to this post.

The edges of the diaphragm were free to vibrate; I don't know whether that is described in the drawings.

Adjourned until December 14, 1881, at 10, A. M.

December 14, 1881, 10, A. M.

Examination resumed pursuant to adjournment, and
Adjourned until December 15, 1881, at 10 o'clock, A. M.

December 15, 1881, 10.30 *o'clock*, A. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Examination of Daniel Drawbaugh by Mr. Hill continued:

Q. 306. Is the form of machine, which is represented in "Exhibit M drawing" and shown clearly in the lower figure thereof, the modification described at the last end of your preceding answer, and containing the post?

A. There is a post there, but it is not the one I referred to.

Q. 307. Describe the one you referred to. How did it differ from the post in this drawing?

A. In the drawing referred to, there is a portion of a post represented not connected to the diaphragm. The post or rod referred to first was secured to the center of the diaphragm by being riveted or soldered and then run down between the electro-magnets to the bottom screw F, and was fastened thereto.

Q. 308. The top of the post F, in the drawing, is provided with a screw-hole. If the diaphragm were secured to the top by a screw, would the arrangement then be the same as referred to as existing in the original instrument "M" at one time?

A. Yes, sir; it would produce the same results. I don't remember whether it was fastened with a screw. I thought it was soldered or riveted, but that would make no practical difference.

Q. 309. If I understand you correctly, the two instruments "L" and "M" were originally made, as shown in the drawings "Exhibit reproduced L drawing" and "Exhibit reproduced M drawing," and were afterwards changed to the forms shown in "Exhibit L" and "Exhibit M," and in the two drawings "Exhibit L drawing" and "Exhibit M drawing?"

A. Yes, sir.

Q. 310. As originally made, they could be used both as transmitters and receivers, could they?

A. Yes, sir; and after the other modification—after placing the permanent magnet—they could be used as transmitters or receivers.

Q. 311. Did you use them at any time, without the carbons and without the permanent magnets, merely as receivers?

A. I don't remember that I did. I may have, but I can't remember.

Q. 312. Have you stated all the modifications that you made in these two instruments "L" and "M?" If not, state any other modifications that were made.

A. No, sir; at sometimes I allowed the circuit to pass through both coils at the same time; that is, dividing the circuit into branched circuits, and placing one coil in each branch.

Q. 313. How did these two instruments work in these various modifications?

A. In this modification that I last referred to, I don't remember of noticing any difference. In the modification with the permanent magnets, they were a much greater improvement than before I used them —got better results—more practical.

I used it first, just as shown in "drawing reproduced M." Then I took off the heel-bar, and put on two permanent magnets in its place. They were bent magnets as shown in "Exhibit M;" in that form of that instrument I could use it better as transmitter and receiver. When using it this way, I had a battery. At one time I removed the carbons from one of these two instruments and substituted the post that I have described, and used this instrument so modified, with the other instrument, without modifying the other instrument. It is a little hard for me to describe it.

Then at a later modification, I took and closed them permanent magnets, so that they came closer, and would require shorter armatures. Then they were used as receivers, or as magnetos, as shown in "Exhibit L drawing."

The results of these modifications were not always the same. Some were better than others, but I had results in all.

Q. 314. In all the modifications could you hear and understand through the instrument what was said—spoken speech—or not?

A. Yes, sir.

Q. 315. What was your object in making these various modifications of these two instruments from time to time?

A. Trying to make a better machine and get better results. The modification shown in "Exhibit L drawing," I think, was made after instrument "Exhibit H," and used in connection with that instrument.

Q. 316. If your telephone was capable of transmitting spoken speech so as to be distinctly heard and understood before that time, why were you experimenting to get better results?

A. That is a question I hardly know how to answer. I was experimenting to get better and louder results. I may have had other reasons.

Q. 317. Are you still experimenting to see if you can get better results than anybody has gotten yet with telephones?

A. Yes, sir; I still am experimenting and trying to get better results

Q. 318. You think that the telephone, then, has not yet reached its highest possible perfection, do you, although hundreds of inventors have been working at it and hundreds of patents have been issued upon it.

A. I do think it hasn't got near to what it will yet.

Q. 319. Referring to "Exhibit L" and to "Exhibit L drawing," what was the purpose of the pressure spring *b*, and its adjusting-screw G?

A. Used as a dampening spring for preventing too easy vibration.

of the diaphragm. But I have now discovered that in using a thicker diaphragm I found it was not necessary to have a dampening spring, or in reducing the diameter it is not necessary.

Q. 320. In "Exhibit L," I observe you use a compound diaphragm. What was your object in trying that form of diaphragm?

A. I thought I could have better results. That is, I would get the vibration of two surfaces. That was a modification of some prior experiments; in the prior experiments I thought I got better results. I might refer you to instrument "C." In that instrument I had used two diaphragms and the one diaphragm—the inner one, next to the mouth-piece—had openings.

Q. 321. Referring to "Exhibits G" and "O," were those two instruments "G" and "O" made at the same time, or made to work together?

A. They were made pretty nearly the same time, I think.

Q. 322. Will you describe them as they were originally made and used, referring to the drawings "Exhibit G drawing" and "Exhibit O drawing?"

A. Yes, sir.

[*Instrument marked* "*G.*"] A is the body, or case, of the instrument; B top of instrument, or cap.

F is a carbon-holding tube of wood; J an adjusting-screw, recessed or bored out at screw end I, for the reception of a coiled spring. Sometimes I used a soft rubber block in place of the spring; in said wooden tube were placed carbon balls. The number I often changed at different times.

At the bottom, underneath the lower carbon ball, was placed a small copper plate G′, in the lower end of the tube.

In the center of the small plate is secured a conducting wire, which passes out of the wooden tube and passes to one of the screw cups or binding posts E.

At the upper end of the wooden tube is another plate G, secured to a small rod; diaphragm C rests in a groove at the top of the casing A, and is kept in place by the cap-piece B.

At the center of the diaphragm C is secured a small brass cup the lower end of said cup contains a cone-shaped opening for the reception of the upper end of the rod of the upper contact plate G.

To the rod before mentioned is secured another conducting wire, which passes to the other of the screw posts E.

The current passes into one of the screw posts E, then to one of the contact plates; through the carbon balls into the other contact plate; through conducting wire to the other of the screw posts E.

J, the adjusting-screw, is for compressing, more or less, the carbon blocks, so as to get the instrument into proper adjustment. The carbon blocks were used as low conductors, to modify the current, according to the different degrees of compression produced by the vibration of the diaphragm.

In this instrument "G," and in the drawing, there is nothing wanting but one or two of the carbons,—places for which are shown by dotted lines in the drawing.

[*Instrument marked* "*O.*"]

This instrument "O" was originally exactly the same as instrument "G." At an after-time I made a modification in it. Instead of the cone-shaped cup on the diaphragm to receive the end of the rod, was placed another brass cup *c*, holding a carbon block or ball *c′*.

At the bottom of the wooden tube, corresponding to carbon tube F in instrument "G," is a similar brass cup F, containing a carbon ball *f*.

The space between the ball *f* and the ball *c′* was filled with other carbon balls in contact with each other. I don't remember their number. They were provided with the same adjustment as in instrument "G."

The current went in the same direction as in instrument "G," with the exception that the upper conducting-wire was connected to the diaphragm, and the other conducting wire to the lower brass carbon cup F.

Q. 323. Were the two machines "G" and "O" used for talking telephonically?

A. Yes, sir; they were used as transmitters.

Q. 324. How did they operate—satisfactorily or not?

A. Yes, sir; they did.

Q. 325. Do you remember what receivers were used with them?

A. I couldn't remember all; but the instruments represented in "Exhibit L and M drawings" were used with them.

Q. 326. Do you remember whether the old tin can instrument "B," or the flat instrument "A," or the two magneto instruments "D" and "E," were used as receivers with them?

A. The two magnetos "D" and "E" were. I think "A" was, but I don't remember certainly. I don't remember whether "B" was or not. All that were in condition for use were used as receivers with them.

Q. 327. Was "A" out of condition for use at any time? If so, when and how?

A. I don't remember at any other time than when Mr. Knight was making drawings of it, and separated some of the wires.

Recess for dinner until 2, P. M.

December 15, 1881.

Examination resumed pursuant to adjournment.

Present, same counsel.

Examination of Daniel Drawbaugh by Mr. Hill continued:

[*Mr. Hill offers in evidence as "Exhibit J" the instrument which has been heretofore referred to as instrument "J."*]

Q. 328. Please look at "Exhibit J," and state what it is and who made it.

A. That is a telephone transmitter. I made part of it and was assisted by George Drawbaugh on parts of it.

Q. 329. Has this instrument ever been modified in its construction since it was first made, or is it the same, with the exception of wear and tear, as when it was first made?

A. It is the same as when it was first made, with the exception that it has been a little roughly handled.

Q. 330. Will you please describe the instrument and its mode of operation as originally made, referring to the drawings?

A. It is composed of a casing or box, A, and a front cover, B, hinged to said box.

On the cover of said box is a portion of the transmitting parts.

There is an oblong iron ring, C. On the inner side of that ring is a groove for the reception of an iron diaphragm, G, held in place by a brass wire oblong ring, F, which is secured in place by four screws marked *f* on the drawings.

In the center of the upper portion of the iron ring is connected to it a flange, forming part of said ring, extending up some distance and being provided at its upper end with a wooden insulating block, D^2 upon which is placed or secured two springs or levers, D D, secured by two screws d^2, one on each.

At the lower end of said springs or levers are two adjusting-screws *d d*, passing through them and screwing into another flange, C′, at bottom of ring; *c* are four screws for securing said iron ring to the inside of the cover of the box.

EE are two brass brackets secured to the side of the iron ring by two screws *ee*, and extending in towards the center of the diaphragm one from each side of the cast-iron ring C.

At the inner end of said brackets are secured two wooden tubes E′, one in each bracket for holding the carbon balls.

Immediately in front of said wooden tubes, secured to the diaphragm, are two brass cups OO^2 for holding blocks *oo′*.

The carbon cup O^2 on the left-hand side is fastened to a rubber strip or flange O′, which is secured to the diaphragm, so that the cup O^2 is insulated from the diaphragm.

There are two brass springs D′ fastened to spring levers D, some distance above the center of the diaphragm, by two screws *d′*; their lower ends are provided with two brass cups d^5, secured thereto by screws d^4.

Two carbon blocks d^6 are secured to said cups.

At the upper end of the brass spring levers are two switch levers D, secured by two screws or rivets d^3, to said brass spring levers.

D^4 are two circuit posts.

Within the interior of box A, at its lower side, are placed two induction coils H, held in place by two straps of tin *h*.

On the bottom end of said box are two switch levers J, and two contact plates J′, at the outer edge of the box; immediately above the induction coils H, are four switch levers I, I′, arranged in two pairs, either of the left-hand pair I, I′, can be brought into contact with the left-hand plate I^2; either of the right-hand pair I, I′, can be brought into contact with the right-hand plate I^2.

The two central levers I′, I^1, can also be swung so as to make contact with each other, as shown in the drawing.

On the outside of right-hand side of the box are two switch levers K, shown in the "elevation of right side," sheet 2. On that sheet each of them is shown in contact with its contact piece, which is shown by dotted lines passing through the side of the box at the extreme right-hand side of sheet 1; they are the two lower ones of the four shown on that side, which are in the side of the box directly under the knobs *k*. One of these levers is pivoted at the screw *k′*, and the other is pivoted at the upper front binding post on the side marked L.

The current from the battery comes in at the upper front post at the side, marked L, passes through the switch K, to its contact piece, which is underneath it in the drawing; from there, by the long wire shown on inside elevation, it passes to a contact plate T′, on the front right-hand corner of the bottom; then through the right-hand switch lever J; thence through switch lever J to the top of the right-hand coil H; then through its primary coil; from the other end of that primary a conducting-wire goes to the lower hinge *b*; then through a conducting-wire to the diaphragm, at a point marked P in the plan of diaphragm; then to the right-hand cup and carbon O, *o*, and through a number of carbon balls in the right-hand wooden carbon-holding tube E′; then to a carbon block d^6 secured to the cup d^5, then to right-hand spring D′; then passing to switch lever D^3; then to the right-hand conducting post D; then to the upper hinge *b*; then to either of two binding posts L, on left-hand outer side of the instrument, near the upper end; one of these is shown in a dotted line behind the cover, in the front inside elevation, sheet 1, and also in the outside front elevation.

There is another similar screw post on the same side directly behind it, not shown in any of the drawings. From those posts the circuit went to one of the poles on the battery; the other pole of the battery was connected to the binding-screw on right-hand side of the case, from which the circuit has been described as starting. Then completing the circuit inside and outside of the case.

The circuit for the secondary current induced by the primary above described runs as follows:

Starting from binding post L, at upper right-hand corner of case, by a conducting-wire, to contact plate I^2 on right-hand side of the back of the instrument; then through the corresponding switch lever I, and through its contact plate *i*; then by a short wire to the end of the secondary of the right-hand induction coil, then out of the opposite end of the secondary to the left-hand contact plate *i′*, and switch lever I′, to left-hand contact plate I^2; then by a conducting-wire to binding post L at left-hand back corner at top of instrument, thence to the main line and around through the main line back to the point of beginning.

The induction coil at the lower right-hand corner of the instrument can be disconnected, and the induction coil at lower left-hand corner of the instrument connected, as follows:

I will now describe how I set the switches to cut out the primary of the right-hand coil, and carry the battery current through the left-hand coil.

The upper front switch on the right hand of the outside is now swung off from its contact piece.

The right-hand switch J, at the bottom of the box, is now swung off from its contact piece J'.

The right-hand switch D^3, leading from the upper end of the brass spring lever to the upper right-hand contact post D^4, is now swung off from that post. This destroys the connections which formed the circuit as previously described. I will now make the connections to carry the circuit through the primary of the left-hand induction coil.

The circuit comes in at the upper rear post on the right-hand side on the outside of the box, shown in the elevation on sheet 2, passes then by a wire to the screw k', the inner end of which is shown on the inside elevation, sheet 2. This screw forms the pivot for lower rear switch K, through which the current passes to contact plug underneath the switch knob *k*. It is the lowest of the four screws which are shown in dotted lines passing through the extreme right-hand side of the box, in the front inside elevation on sheet 1. Thence through a conducting-wire to the primary of the left-hand induction coil, at a point which is marked "C P" on the instrument, but which is not marked on the drawings. The other end of the primary of that coil comes out at a point which is marked in the instrument "C S," but which ought to be marked "Z P." Then it comes out and connects to the left-hand switch plate J', on the left hand of the bottom of the instrument, by a wire, the whole of which is not now on the instrument, and which is not shown at all on the drawings. Then through the left-hand switch lever J, to its contact piece J'; then through a wire which goes to the cover of the box, where it is secured by a piece of card-board and tack *mm'*, and connects to the left-hand contact post D^4; then to a switch lever D^3; then to spring lever D; thence through the left-hand brass spring D'; thence through the left-hand carbons to the insulated cup O^2; thence through the wire shown in the "plan of diaphragm" and "inside of cover" as i^4; thence to the clamping screw n^2; thence by the wire i^3 to the upper hinge; thence by wires inside the box, to the two binding posts near the top of the left-hand side of box, and thence through the battery to the post I started from. That makes the primary circuit, which includes the primary of the left-hand induction coil and the left-hand carbons.

I will now describe the secondary circuit of the same coil.

Starting from the right-hand post on the top of box circuit, passes through a conducting wire to right-hand contact plate I^2, to right hand switch lever I', which is swung into contact with it; then to the left-hand switch I', which is swung over to the right, so as to make contact with the right-hand switch I'; thence through said left-hand switch I' to the left-hand coil, through its secondary; then to the left-hand switch I; then to the left-hand contact piece I^2; then, by the wire shown in drawing, to left-hand binding post on top of the box; then to the line, and back through the line to the left hand binding post on top of the instrument.

I believe I have described the connections correctly, as they were, but there might be other ways of arranging the switches.

Some of the wire connections are disconnected, so that they do not make the connections which I have described. For example, the two wires marked i^4, on the inside back of the box, sheet 1, proceed from the coil, but are not connected to anything at their other ends. The other ends were formerly connected to some of the switches. Both of these wires belong to the secondary coil. There is also a short piece of wire which now projects from the upper end of the left-hand induction coil of the instrument, nearest the back. This is not shown at all in the drawings. The draughtsman seems to have overlooked it. When in working order, it would come down and connect with the pivot of the switch J on the left-hand side of the bottom of the box.

Adjourned until December 16th, 1881, at 10, A. M.

December 16, 1881, 10 *o'clock*, A. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Examination of Daniel Drawbaugh by Mr. Hill continued.

[*Answer resumed.*]

In using this instrument, I sometimes put the primaries of both coils in circuit with one set of carbons—either the right-hand or left-hand set; that is, either one of them; that is my recollection. I did this by putting on an extra wire. You will notice on the two spring levers D, just below the screws d^2, two small octagonal plates attached to the spring levers D by screws, but not lettered in the drawings. These plates and screws are for clamping conducting wires—a sort of binding post, similar to the binding arrangement n', n^2. The extra wire

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that I referred to ran from one of these clamps to the other, for the purpose above mentioned.

When I did this, my batteries were both in the primaries of both induction coils, one battery being in one primary, and the other in the other. I described, yesterday, that I used the primary of the right-hand induction coil and its battery with the right-hand set of carbons. I also described that I used the primary of the left-hand induction coil and its battery with the left-hand set of carbons. I would farther state that I used both of said arrangements together, or at the same time. In that case, both of the secondary currents went into the main line together, combining as one current, for the purpose of increasing the strength of the secondary current.

Q. 331. Did you use this instrument "J" for talking from one place to another? If so, to what extent?

A. Yes, sir; I used it for talking on different short lines in the shop. A number of people used it; I couldn't enumerate who they were. I used it pretty often while I was experimenting with it—trying it.

Q. 332. Did it work satisfactorily or not?

A. It did.

Q. 333. When you used the two primary currents through separate sets of carbons, and threw both their induced currents on the main line together, what was the result? Any improvement or not?

A. They were better when using both together.

Q. 334. State whether or not any changes have ever been made in this instrument since it was first constructed.

A. To the best of my recollection, there was no changes in it.

Q. 335. State whether you can fix the time when this instrument was first constructed, and if you cannot fix the exact time, give it as near as you can.

A. I cannot fix the exact time; it may have been between the year 1877 and 1878—thereabouts, as near as I can recollect.

Q. 336. It may have been most any time, but what is your recollection about the time?

A. As near as I can recollect, in them periods, or between them periods—1877 or 1878. I can't distinctly recollect the time.

Q. 337. Do you distinctly recollect making the instrument?

A. Yes, sir; I do.

Q. 338. Who made the case of the instrument?

A. I think it was George W. Drawbaugh.

Q. 339. Do you recollect whether the case or the machinery of the case was first made?

A. The machinery in the case was first made, I think. I am pretty confident of that, because I generally made the working parts before the cases were made.

[*Mr. Hill puts in evidence as "Exhibit P," the instrument which has been heretofore referred to as instrument "P" by the several witnesses*]

Q. 340. Please look at "Exhibit P," and state what it is and who made it.

A. That is a telephone transmitter and receiver, both combined. I made part, and part, I think, was made by George Drawbaugh. I was assisted by some one, I know, and think that it was George W. Drawbaugh.

Q. 341. What part did the assistant make?

A. The part made of wood—the wood casing, board, &c. I know I made the working parts, and part of the wood—those caps, including the mouth-pieces.

Q. 342. Which of the two machines was made first—this machine, marked "P," or the machine you have previously described, marked "J?"

A. I am positive that "J" was made before "P."

Q. 343. What is your best recollection as to how long "J" was made before "P?"

A. It may have been six or eight months; perhaps a year. I cannot recollect the length of time between those machines.

Q. 344. Has the machine "Exhibit P" ever been changed or modified since it was made or not?

A. It has not, to the best of my recollection.

Q. 345. Please describe the machine "Exhibit P" and its mode of operation in its completed condition.

A. A represents the base board. B a block for holding diaphragm, caps, &c. On the under side of said block B, was a horse-shoe-shaped groove for the reception of a permanent compound magnet I′.

On one of the poles of the permanent magnet I′, was secured an electro-magnet I, by a screw through the lower pole and into the heel of the core of the electro-magnet, as shown on "rear view of block B," sheet 3, of "Exhibit reproduced P drawing."

There is an opening through block B for the reception of the electro-magnet I. At the front side of block B, at the right-hand side, as shown in " Exhibit reproduced P drawing, sheet 2," there is a shallow recess for the reception of a metal diaphragm H.

Under the edge of the diaphragm is a circular groove for the reception of a rubber ring or gasket H'; said diaphragm is held in place by a wooden cap D, secured to block B by three screws.

In the center of cap D, there is a brass tube D' for the reception of a rubber tube D^2; said rubber tube has within it a spiral spring D^3, extending through its whole length, and terminating in the mouth-piece; said spiral springs extend out some distance from the end of the rubber tube, and its inner end slightly touches the center of the diaphragm H.

At the outer end of the rubber tube is attached a brass tube secured to a wooden mouth-piece, which mouth or rather ear-piece is not shown in the reproduced drawings, but appears in " Exhibit P drawing, first sheet." The ear-piece is composed as follows:

A bottom piece for the reception of a brass tube, and a recessed cap piece for the reception of a thin diaphragm. I used mica for this diaphragm, but have used a number of other substances.

The diaphragm is held in place between the cap piece and bottom piece of the ear-piece. The outer end of the spiral spring contained in the rubber tube D^2 lightly touches the mica diaphragm in the ear-piece just described.

At the left-hand side of the block B is another opening through said block, which is also recessed for the reception of the diaphragm of transmitter, which diaphragm is shown separately on sheet 3 of the drawings.

In the center of said diaphragm is secured to it a brass cup *e*, which is fitted with a carbon ball or block e'. Immediately back of said last-mentioned carbon block was another carbon block *f* suspended on a wooden pin f', passing through a hole in the upper end of the carbon.

Recess for dinner until 2 o'clock, P. M.

December 16, 1881, 2 *o'clock*, P. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Examination of Daniel Drawbaugh by Mr. Hill continued:

[*Witness continues.*]

There is a groove in the wooden block B, not referred to by letters in the drawings, for the reception of spring lever G′, at the upper end of which is secured thereto a brass cup G^2, for holding a carbon ball G^4.

The opposite end passes to a point opposite the screw K′. Said screw is for moving spring G′ with its carbon cup and ball closer to or further from the carbon suspended piece *f*. Some of these parts are not now in the original instrument; the screw K′ is.

K was a screw passing through the center of block B, or nearly so, for adjusting the electro-magnet closer to and further from the diaphragm H; L is a block of wood secured towards lower end of base-board A, which, on its back edge, has openings for the reception of induction coils L^2, which are placed in recesses L^1. One of these coils still remains in the original instrument. The openings extend through base-board A, and are marked J, on "P drawing, sheet 2"; they are four in number. In the center of cap-piece C is secured a brass tube C^2. At its outer end is secured a small funnel-shaped mouth-piece C′, for the purpose of transmitting sounds made in front of it.

Some of the conducting wires are off.

A wire passing through an opening in the base-board of upper left-hand corner, as shown in "Reproduced P drawing, sheet 1," goes through the base-board, and then passes down a groove on the back side of said base-board to the induction coil, on the right-hand side of "Rear elevation, sheet 2," of "Reproduced P drawing," and is connected to the secondary of said coil; thence through the secondaries of the series of coils; thence by a conducting wire, from said coil to an opening at upper right-hand corner of base-board, as shown in "Reproduced P drawing, sheet 1."

In the original instrument it shows the wire through a groove, and passing out at an opening opposite the right-hand end of block B, as shown in "Exhibit P drawing, first sheet."

A conducting wire passing through a hole or opening at lower left-hand corner of base-board, as shown in "P drawing, sheet 2," then up in a groove to primary of the induction coil, shown in "P drawing, sheet 2," then through the primaries of the other coils of the series, which were in the machine, but are not now, then to the diaphragm of transmitter by a wire marked g^2, on "Reproduced P drawing, sheet 3"; the circuit then passes through the carbons to spring G', then to a conducting wire G^3, then to a wire that leads out through the largest one of the holes marked l^5, on "Reproduced P drawing, sheet 2," which is also the largest of the holes marked L, in "P drawing, sheet 2," rear elevation, out to the front through a hole at the lower right-hand (left-hand corner of rear view) corner of the base-board A. This last-mentioned wire is shown on "P drawing, sheet 2," and is now on the instrument; that primary circuit continues outside and includes a battery, and then comes back to the starting-point.

One end of the coil of the receiver is connected to one of the secondary wires already described, and the other end to another of the secondary wires.

The grooves for these two wires are shown on "Rear view, P drawing, sheet 2." One of them is the long, straight diagonal groove, and the other is the short perpendicular one at upper left-hand corner of the figure.

Q. 346. Was this instrument "P" actually used for transmitting vocal speech? If so, how extensively?

A. It had been used similar to the other machines described; that is, I mean as extensively as the others, prior to this one. A number of persons spoke through it, and I spoke through it to a number of persons.

Q. 347. How satisfactorily did it operate?

A. As a transmitter, it acted very satisfactorily; as a receiver, not as good as some instruments that I had; but still you could hear and understand what was said. The instrument could also be used as a magneto instrument, speaking and receiving through the tube.

Adjourned until 10 o'clock, A. M., December 17, 1881.

December 17th, 1881, 10, A. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Examination of Daniel Drawbaugh by Mr. Hill continued:

[*Mr. Hill puts in evidence the machine heretofore referred to as instrument "N" to be marked "Exhibit N."*]

Q. 348. Please examine the instrument "Exhibit N" and state what it is, and who made it.

A. That is a telephone receiver and I made it.

Q. 349. State, as near as you can, the time when you made this instrument "N."

A. It is a little hard for me to state the time—just as in the others; working on so many, I have entirely lost the time of this one and others. I couldn't give the accurate time of any of them; not all, but some of them. "C" instrument I had circumstances to fix the time by; them that I had no circumstance to fix the time by I can't give the time of.

Q. 350. Please approximate the time of making instrument "N," as nearly as you can.

[*Objected to by Mr. Storrow.*]

A. I am perfectly satisfied that it was made before exhibit "P."

Q. 351. Was it actually used as a telephone receiver? If so, to what extent, and how satisfactorily did it operate?

A. I used it as a telephone receiver—that is, I spoke through it and others spoke through it. I thought it was a good receiver. I thought better than any others that I had previous to that.

Q. 352. Please describe the construction and mode of operation of "Exhibit N," as originally made and used, referring to "Exhibit N drawing," by way of illustration.

A. A represents the case or body of the instrument. C the lower cap of instrument; B upper cap; D coils of the electro-magnets. E two permanent magnets with their poles halved together, north to north and south to south. The poles are secured to the cores of electro-magnets by two iron machine screws. The lower side of the instrument is recessed to receive the permanent magnets. There are also two recesses through the instrument at or near the center, for the reception of electro-magnets D.

The permanent magnets carrying the electro-magnets are secured to the case of the instrument, in the recess at the lower side of the instrument, by two screws, shown on "rear elevation" at the top and bottom of figure. At the top of the case or body A of the instrument, was a shallow recess for the reception of a diaphragm. When the diaphragm rested in said recess, it came close to the poles of the electro-magnets, but not quite touching them.

At the upper side of the diaphragm were placed paper gaskets or rings, which supported or secured the diaphragm when the upper cap B was placed on the machine and pressed down.

On the under side of cap B, is secured to it a brass spring L, shown in the figure marked "inside of cap," also in "front elevation," having a circular brass block secured to the inner end by a small screw.

The original diaphragm was in one piece, and was, I think, of iron. I also used tinned iron. I used a number of materials.

There was also a screw, marked *l* in the drawing, for the purpose of adjusting or compressing inner end of spring L, closer or with more force against the diaphragm.

Q. 353. Did you afterwards modify, in any respect, the construction of this instrument? If so, how?

A. Yes, sir; the recess in the casing or body of instrument at the top was made deeper for the reception of a soft rubber ring or tube F′, which was placed around the outside of a plaster-of-Paris disc F, having an opening in its center, which opening admitted the top of the electro-magnets.

Upon said gasket or ring was placed the diaphragm, composed of two semi-circular halves, shown in the drawings as G G, made of steel and polarized.

Upon that was placed a wooden disc M, with a paper gasket or ring between it and the diaphragm. At its upper side it also had a paper gasket, the whole being kept by the upper cap piece B, which was secured by screws at its outer edge, to the upper part of the case; that is the modification.

I forgot to mention that there was an opening through the center of the wooden disc, as shown in the drawing at the lower right-hand corner. That is all the modification that I can think of.

Q. 354. How long was that modification made after the original instrument "N" was made, to the best of your recollection?

A. To the best of my recollection, it was not very long, though it might have been several months.

Q. 355. Was that modification made before this instrument "P" was made or not?

A. I could hardly say, but I think it was.

Q. 356. When you stated that the instrument gave good satisfaction and worked better in your judgment than any other receiver, did you mean that it worked better in its original form, or in its modified form, or in both forms?

A. I don't think there was much difference in its results. I think it worked about as well in one form as in another.

Q. 357. In the figure of "Exhibit N drawing," which represents a "front elevation, cap removed to show diaphragm," the divided steel diaphragm is represented with the plane of division intersecting both poles of electro-magnet. Was that the arrangement that you used, or if not, how was the line of division arranged?

A. When the machine was originally made, it was intended that the line of division would be through between the poles of the electro-magnets, at right angles to the way in which it is shown in the drawing. But when experimenting, I used it in different positions, without any material difference in the results.

Q. 358. Is this the only machine in which you ever used a polarized diaphragm?

A. It is the only one in which I used a permanently polarized diaphragm; but it is not the only one in which I used steel diaphragms.

Q. 359. Would or would not the steel diaphragms become polarized by use?

A. That would be somewhat of a question—to answer that. My opinion is that they would not. That is a question that electricians might not agree upon. I have tested them to see, but not very thoroughly; I just noticed that they did not become polarized.

Q. 360. On what instrument did you first use steel diaphragms, so far as you remember?

A. On either L or M; I don't remember which of the two.

[*Mr. Hill offers in evidence as* "*Exhibit Q*" *the instrument heretofore referred to by the witness as instrument* "*Q.*"]

Q. 361. What is this instrument, "Exhibit Q," and who made it?

A. That is a telephone receiver, and I made it.

Q. 362. Please give a brief description of it.

A. It was made in a similar manner to "Exhibit N," as the latter was when first made, with the exception of this one, "Q," having an iron diaphragm D, divided part way through its center as shown in the drawing; and that the ear-piece is made separate from the cup, but that was merely for convenience in turning, and is of no importance. The instrument never was used. There was a defect in the coils. I suppose the wire had been broken in winding it. There is another change in it, too:

In the bottom recess for the reception of the permanent magnet is turned a shallow groove for the reception of a diaphragm, which was kept in place by a paper gasket. The center of the diaphragm came close to the heel screws, which secured the permanent magnet to the coils, though the diaphragm did not quite touch said screws.

The intention of this instrument was to determine whether I could get better results by adding both of these vibrations in one, by adding the effect of the vibration from the rear diaphragm to that of the front. There was an opening around and between the electro-magnets, and I thought the vibrations might go through and add to the effect of the front diaphragm. I think yet it would make a good instrument.

The permanent magnet in this instrument is compound.

[*Mr. Hill offers in evidence as "Exhibit K" the instrument heretofore referred to as instrument "K."*].

Q. 363. Please state what this instrument, "Exhibit K," is and who made it.

A. It was intended for a telephone receiver, and has never been completely finished. I made it.

Q. 364. When was that made, to the best of your recollection?

A. I don't know. I have no distinct recollection.

Q. 365. Was it made before, or after "Exhibit P?"

A. It was made after. I might state—I have some circumstances. I think it was in the spring or summer of the same year that that interference suit between David Hauck and myself was being tried. Mr. M. W. Jacobs came to my shop. I think it was in that spring or fore part of the summer, and I showed him the instrument, and I had made it some time before, but do not remember the length of time.

[*By agreement of counsel, it is here certified that the testimony in the interference suit referred to, was taken in the summer of* 1879.

FRED. M. OTT,
Examiner.]

Q. 366. Was this instrument "K" practically used or not?

A. I had tried it, but did not get any good results, but heard spoken words through it. When using it, I found the jar or noise, produced by turning the friction roller, drowned out the results of the articulation or sound of the voice.

The friction roller was intended to be moved by clock-work—a continuous motion—but that portion was never applied.

Q. 367. Please describe the instrument and its mode of operation, referring to the drawings by way of illustration.

A. I will try to describe it. A represents a casing or body of the instrument; B, cap or mouth-piece; C, rear or bottom cap; F, two permanent magnets, bent as shown in "plan view" in the drawing; said magnets are halved together at their poles, that is, south pole to south pole, and north pole to north pole. At the poles of the permanent magnets are secured two coils on an electro-magnet G. The permanent magnets, with the electro magnet, are secured to the inside of the case or body A, of the instrument, by two wooden cleats F′, which are held in place by screws K. The poles of the electro-magnet extend in from the sides towards the center of the case A.

Immediately in front of the poles of the electro-magnet G, is placed an armature E, of iron; said armature E is held in place by two strips of metal, one *e*′, at bottom, attached to bottom diaphragm J, the other *e* attached to upper diaphragm D. That diaphragm is of brass.

On the side of the armature next to the friction roller, is secured a brass friction block, E′, for the purpose of being acted upon by friction roller H. Said roller is secured to a round wire rod or shaft passing through the case A. There are two brass binding posts, one at each side of case A, for the reception of conducting wires of coils of electro-magnet G.

The modified electric currents passing through the coils caused the armature to move to and from the poles of the electro-magnet, the movements, being in correspondence to the modifications of the current, cause different pressures of the brass plate E′ against the friction-wheel H, which would produce different amplitudes of vibration of the diaphragms.

The lower diaphragm was secured to a wire rod *e*′ by a screw-nut for adjusting the tension of the two diaphragms.

Q. 368. Did you ever make more than one instrument on the principle of the instrument K; that is to say, operating by friction, the amount of which was controlled by the armature?

A. No, sir. This one never was finished; it was finished all but applying the clock-work to turn the shaft of the friction roller.

Q. 369. Is the instrument "K" the latest one of all the original instruments which have been put in evidence here?

A. Yes, sir; it is.

Q. 370. Since you made that instrument "K," in the early half of 1879, or before that, have you made other telephone instruments which have not been the subject of testimony here in this case?

[*Objected to by Mr. Storrow.*]

A. Yes, sir; quite a number.

Q. 371. Where they good practical working instruments or not?

[*Objected to by Mr. Storrow.*]

A. Yes, sir; they were.

Q. 372. Are you still engaged in studying and experimenting to perfect and improve the electric-speaking telephone?

A. Yes, sir.

Q. 373. Have you made applications for letters-patent on your electric-speaking telephones?

[*Objected to as calling for secondary evidence and immaterial.*]

A. Yes, sir.

Recess until 2 o'clock, P. M. for dinner.

December 17, 1881, 2, P. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Examination of Daniel Drawbaugh by Mr. Hill continued:

Q. 374. About what time did you make your first application for letters.patent on the telephone?

[*Same objection.*]

A. In July, 1880.

Q. 375. Can you give me the date of the death of your father?

A. It was about the 9th or 10th of December, 1878.

Q. 376. How old is your little boy Charles?

A. He is about eleven.

Q. 377. Is the telephone in any way associated in your memory with the time of his birth? If so, state the fact.

A. Yes, sir; some time after his birth—say a week or ten days—I took an instrument to the house that I was living at then. My wife was up-stairs in bed. I gave her one of the instruments and told her to listen, I would go down-stairs and I would speak to her. I did so, and she said afterwards that she heard the words that I spoke through it; I do not remember what the words were. The instrument that was used was, I think, the "C" instrument; I am pretty sure; I won't be too positive, but I think that was one of the instruments. I had a receiver with it, but I don't remember which one I had.

Q. 378. Did you have batteries connected with it?

A. Yes, sir.

Q. 379. Do you know what a string telephone or lovers' telegraph is?

A. Yes, sir; I do.

Q. 380. Did you ever make one?

A. No, sir.

Q. 381. Did you ever own one?

A. No, sir.

Q. 382. A great many witnesses in this case have testified that at different times, from 1869 down to within about a year last past, they have talked, or heard others talk, through instruments or machines at your shop, to which you gave the name of talking-machines. State whether or not those instruments, or any of them, through which said witnesses, or any of them, talked or listened, were string telephones.

A. No, sir; they were not.

Q. 383. State whether those said instruments, or any of them, through which said witnesses talked or listened, were or were not make-and-break telephones—by which I mean electric telephones in which the vibrations of the transmitting diaphragm make-and-break the electric circuit.

A. There were no make-and-break instruments.

Q. 384. I forget whether I have asked you the question, whether you ever invented or made a make-and-break telephone. Please state the fact whether you did or did not.

A. I did lately, within the last year or thereabouts; I never did before that.

Q. 385. You have stated that all the telephone instruments about which you have testified, from the original cup transmitter down to the friction receiver K, and including all the instruments which have been put in evidence, were made by you or under your direction. Please state who invented each and all of said instruments.

[*Objected to as incompetent.*]

A. I did.

Q. 386. Did you attend the Centennial Exhibition, at Philadelphia, in the year 1876?

A. Yes, sir; I did.

Q. 387. Can you give the date on which you went there?

A. I can by reference to a book. It was October 17, 1876. The 17th was a day on which I dated a letter from Philadelphia, while I was there on that visit.

Q. 388. How long did your visit there last?

A. About four or five days, to the best of my recollection.

Q. 389. Who went with you on that visit?

A. Mr. George Leonard.

Q. 390. Was that the only visit to the Centennial Exhibition that you made?

A. Yes, sir; it was.

Q. 391. At the time that you went there, or before that time, had you heard that somebody else besides yourself had invented a speaking-telephone—or a telephone?

A. Yes, sir; some time before that, I don't remember how long, but not a great while.

Q. 392. When you went there, did you suppose it would be on exhibition there?

A. I don't remember whether I had heard that it was on exhibition or not; but I got the impression some way that it was on exhibition.

Q. 393. While you were there at the Centennial, did you see any telephones, or make an effort to see any there?

A. Yes, sir; I made an effort and seen an instrument called a telephone, and supposed it to be the instrument spoken of—the one of which I had heard. I was looking and had made some inquiry, and was directed or came to a portion of the building where I saw on a counter some man's telephone, the name I don't remember. At that time, or several times that I called, there was no one there to attend to it. I spoke to another party that had something else on exhibition—I don't recollect what it was—just near by, and I asked him whether there was any one there to attend, or to show the instruments. I was informed then, there was no one there to show them.

Q. 394. If you remember, please state what kind of an instrument it was that you saw there, and state what information you were able to obtain there regarding it and its mode of operation.

A. There was a number of instruments placed on to a raised portion—something like a shelf. That is, it resembled something like pigeon-holes, a box open in front, and each instrument at the back of it had an electro-magnet. The number of instruments I don't remember. I don't remember of counting them. If I am not mistaken, there may have been a dozen or more, perhaps; some were larger than others. I could not give you a much better description than that. I couldn't get any information about them. This attendant made some remarks about the instruments, but he didn't understand them, and couldn't explain them. I was several feet from where the instruments were. They were placed—it occurs to me—on a raised place like a shelf, just about high enough for a man to speak into; that is the way it looked to me. I did not go in behind the counter to examine them, although there was an opening to go in by, because I did not like to make too free, as there was no one there.

Q. 395. Did you see any circulars lying around there referring to these instruments, or other advertisements of them?

A. I don't remember about that; it may have been.

Q. 396. What was your impression as to the character of the instruments, when you finally left them?

A. I was impressed with the idea that they were instruments to telegraph by sounds. A certain sound to represent a certain letter of the alphabet. I am not certain how I got the idea, or whether any person told me that at the time, but that is the idea that I had.

When I said certain sounds, I meant that sounds of a different pitch would represent different letters.

Q. 397. Do you know whether that was "Gray's Harmonic Telegraph" that you saw there or not?

A. It didn't say "telegraph;" I am confident it was called "telephone." I didn't see the working parts of the interior, except the electro-magnets. I took the name of the man and his address on a piece of paper, and put it in my pocket, but I don't know what became of it. I don't know whether it was "Gray's Harmonic Telegraph," or not.

Q. 398. Did you see any tuning forks about it?

A. I did not.

Adjourned until Monday, December 19, 1881, at 2, P. M.

LEPHONE COMPANY,-2

Monday, December 19, 1881.

Adjourned until Tuesday, December 20, 1881, at 10 o'clock, A. M., on account of the illness of Daniel Drawbaugh.

Tuesday, December 20, 1881, 10, A. M.

Examination resumed pursuant to adjournment, and adjourned until Wednesday, December 21, 1881, at 10, A. M., on account of the illness of Daniel Drawbaugh.

Wednesday, December 21, 1881, 10, A. M.

Examination resumed pursuant to adjournment.

Present, Mr. Storrow for complainants and Mr. Hill and Mr. Jacobs for respondents.

Examination of Daniel Drawbaugh by Mr. Hill continued:

Q. 399. Please look at the last six cuts printed in the complainants' printed record, of their application for interlocutory injunction in this cause, between pages 51 and 53, of said printed record, said several figures being entitled in said records as follows, to wit: "Complainants' Exhibit 1, Bell Telephone of 1875, (duplicate,)" "Complainants' Exhibit 2, Bell's single pole Centennial Membrane Telephone," "Complainants' Exhibit 2, Bell's single pole Centennial Membrane Telephone, (sectional view;)" "Complainants' Exhibit 3, Centennial iron box magnet receiver;" "Complainants' Exhibit 4, Bell's double pole Centennial Membrane Telephone." "Complainants' Exhibit 5, Bell's Centennial Liquid Transmitter," and state whether or not the instrument or instruments which you saw at the Philadelphia Centennial Exposition of 1876 were the instruments represented in these cuts, or any of them?

A. They were not.

Q. 400. Had you, or had you not, invented and made operative electric-speaking telephones prior to the time of the opening of said Centennial Exposition?

A. Yes, sir; I had.

Q. 401. Please indicate all the electric-speaking telephones that you had invented or made prior to the time when the Axle Company, composed of Bear, Grove, and others, commenced their operations at your shop—I mean, of all the instruments in evidence, and including the cup transmitter. Which ones of all these had you invented and made prior to the beginning of the Axle Company ?

A. The tea-cup instrument, the tumbler instrument, "Exhibit F," the tin-can instrument, "Exhibit B," instrument "Exhibit C," instrument "Exhibit I," and "Exhibit A," and the magnetos "Exhibit D," and "Exhibit E." Those are the instruments, as near as I can recollect; and I had modifications of these instruments. I won't positively say that "D" and "E" were prior to the Axle Company, but I know that at the time the Axle Company was running I had them there. It may have been prior to the starting of the Axle Company; it may be, but I don't want to be too positive. I refer to "Exhibit D" and "Exhibit E."

Q. 402. State whether or not the machines here in evidence, including those marked "F," "B," "C," "I," "A," "D," "E," and including also the old cup transmitter, of which you have put a sketch in evidence, and including also the modifications, to which you have referred in your testimony, include all the electric-speaking telephone instruments which you made, from the time of the original cup transmitter to the time of the little magneto telephones "D" and "E."

A. No, sir; not all. At the time I was experimenting, I would often make experimental parts—cases, you know, with coils and magnets, and afterwards would make more complete machines—complete cases; that occurred a number of times.

Q. 403. What became of these crude or temporary structures that you so made preparatory to making the more complete forms ?

A. I could hardly state what became of them; they would lie about the shop for some time, and then become destroyed in some way, I don't know what.

Q. 404. Mr. Christian Eberly, a witness on behalf of defendants, has testified, on pages 119 and 120 [114 and 115] of defendants' printed record, that he saw instrument "A" prior to December 22, 1870. How does your recollection, as to the time of making instrument "A," compare with Mr. Eberly's?

A. I didn't think it was as early as that; I may have been mistaken, but my recollection does not run back quite as far.

Q. 405. State whether you have or have not any recollection of that instrument "A" prior to the time when the Haucks bought the faucet business in July, 1873.

A. I can't connect it with that circumstance, to the best of my recollection. I can with the Axle Company. It was prior to the Axle Company, I know.

Q. 406. A good many of the witnesses who have been examined for the defendants have testified that you were, at various times, talking of patenting your electric-speaking telephone invention. What is your recollection about that? Did you intend to patent it or not?

A. Yes, sir; I intended to patent it. I had spoken to a number of persons to assist me. I would state to them that I would give them an interest in the invention, for them to furnish the money to have it patented.

Q. 407. Why did you not patent it with your own money?

A. I didn't have any money.

Q. 408. At how early a time did you have the intention of patenting this invention?

A. I could hardly say how early. I know it was at an early time; I know I spoke to persons even at an early time. I spoke to Mr. Christian Eberly; it may have been prior to 1870. I spoke to Frank Lee; he has been dead a number of years, I don't know how long. I spoke to them about taking an interest in this apparatus, then termed a talking-machine.

Q. 409. Were they among the earliest ones whom you talked to about taking an interest in it?

A. I couldn't say whether they were the earliest; I can say they were among the earliest. I can't remember all the persons I had spoken to about it, as I had spoken to a great many.

Q. 410. Who was Frank Lee, and where did he live?

A. He lived at New Cumberland. He was a man engaged in the lumber business quite a number of years. He and Christian Eberly were in partnership in the lumber business, as Lee & Eberly, I think, at New Cumberland. Afterwards his brother was in partnership with Mr. Eberly, and, I think, under the same firm name, but I won't be too positive about that.

Q. 411. When did you consider the invention sufficiently complete that you were desirous of patenting it, in the form in which you then had it embodied?

A. I could hardly remember the year or give any particular date, but at an early date. At the time I showed it to those parties, I was desirous of having it patented, but some of those parties tried it and seemed to think it was not sufficiently complete; that it ought to be so that it could be placed on a table, and would talk out; that seemed to be the idea. I would then say to them that it could be greatly improved; that I was not yet through with my experiments; that is, that I could make it a great deal louder than it was.

Q. 412. At the time that they tried it and seemed to think that it was not sufficiently complete, or, in other words, loud, were you able, by putting your ear to the receiver, to hear and understand what was spoken into the transmitter at the other end of the line or not?

A. Yes, sir; I could hear, and others heard also, what was spoken through it.

Q. 413. Was it their idea that the instrument should speak loud enough for a person to stand away from the receiver and hear what was said?

[*Objected to by Mr. Storrow as leading, as calling for hearsay, and as calling for ideas of other persons.*]

A. That was the impression I got; that was the idea they had; that it should speak loud enough that they could hear at a considerable distance from the receiver the words spoken.

[*Same objection.*]

Q. 414. From the time when you first invented the old cup transmitter down to the present time, state whether you ever have or have not, at any time, laid aside and abandoned your telephone invention, with no intention of ever resuming it. What is the fact about that?

[*Objected to as incompetent.*]

A. I have never abandoned it, from the earliest time of working at it. I have left it lay for a time, that I was compelled to work on other work, but never abandoned it.

Q. 415. For how long a time did you ever let it lie, at any one time, without doing anything at it, in the way of study, experiment, or the making or testing of instruments?

A. I could hardly say how long I left it lie at one time. It might have been, maybe, six months sometimes that I would not do any work on the machine, but I don't suppose there was a week but what I was engaged in the way of studying on it.

Q. 416. Why were you compelled to let it lie at times and devote your attention to other work?

A. I was compelled for the reason that I was poor. I had a large family to maintain.

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Q. 417. Was the maintenance of your family dependent upon your daily labor or not?

A. Yes, sir; it was.

Q. 418. Did your wife and near relatives endeavor to encourage or discourage you in your work on the telephone?

[*Objected to as incompetent and hearsay.*]

A. My wife and my brothers discouraged me all the time.

Q. 419. Which of your brothers was most opposed to your working on this invention?

A. John B. Drawbaugh.

Q. 420. Did he make a good deal of opposition to it or not?

A. He did, a good bit. He would often speak to me about it; and to avoid that I would often hide the instruments when he would come to the shop.

[*Objected to as hearsay.*]

Q. 421. Were you subjected to any ridicule, in the community where you lived, by reason of your telephone invention, and your work upon it or not?

A. Yes, sir; a good many persons there used to laugh at the idea of working upon a machine of that kind—I mean in the village that I lived at.

Q. 422. Prior to the introduction of speaking-telephones into public use in this country, did you ever learn of your sanity being questioned, by reason of your work upon your talking-machine?

A. That has been said by a number of persons, but not in my presence—not that I can remember of. Other persons would tell me that they said that they thought by my working on it that I was crazy—that it was talked of in the store.

[*Answer objected to as hearsay.*]

Q. 423. At how early a time did you hear of such remarks being made?

A. At an early time; about the beginning of my work and along for several years, I guess—my work on these instruments, I mean.

Q. 424. State whether your work in inventing the electric speaking-telephone, and in subsequently improving the instruments, from the time of the original cup transmitter down to the year 1879, did or did not consume a great deal of time that would otherwise have been devoted to your daily labor for the support of your family?

[*Objected to by Mr. Storrow as leading.*]

A. It did.

Q. 425. Did your devotion to this telephone work, during that period, render it necessary to keep your family more closely—that is, more economically—than would otherwise have been the case, or not?

[*Same objection.*]

A. Yes, sir; it was necessary for me to economize. I was contracting debts, which were demanded of me, and I was compelled to stop working on these machines, to try and get clear of debt. I know that went very reluctantly with me, as I was anxious to work on these machines.

Q. 426. Did that occur more than once, or only once, that you were compelled to stop working on these machines, and pay debts that were demanded of you?

A. Yes, sir; often.

Recess for dinner until 2, P. M.

December 21, 1881.

Examination resumed pursuant to adjournment.

Present, same counsel.

Examination of Daniel Drawbaugh by Mr. Hill continued:

Q. 427. What was your financial condition for several years last prior to the purchase of your faucet and pump inventions by the "Drawbaugh Pump Company," or "Drawbaugh Manufacturing Company"—I mean the company of which Mr. William R. Gorgas was a member—in May, 1867?

A. My finances were very low; I know that.

Q. 428. Were you considerably in debt during that time or not?

A. Yes, sir.

Q. 429. Your first sale to said Company was of your pump invention, if I understand the matter correctly. Am I right?

A. Yes, sir.

Q. 430. Prior to that, you had sold the faucet invention, or a part of it, to A. H. Gardner, known generally as Harry Gardner, had you?

A. Yes, sir ; an undivided half.

Q. 431. What did Mr. Gardner undertake to pay you for that undivided half of the faucet invention, which you sold him ?

A. One thousand dollars.

Q. 432. Was it the same invention in which you sold an interest to Gardner for faucet purposes, that was sold to the Pump Company for pumping purposes, or were there two inventions, one a faucet and the other a pump ?

A. It was the same invention, or held under the same patent. The one I sold to Gardner was for pumping viscid liquids, and the one sold to the Pump Company was for pumping aqueous liquids. That is about the way we style it.

Q. 433. Did Gardner pay that thousand dollars in cash at the time that he bought the interest in the faucet ?

A. He did not ; he gave me a note for the amount, with Dr. Lewis Heck, an iron-master of Dauphin county, as surety.

Q. 434. What became of that note on which Dr. Heck was surety ?

A. I held it for a number of years, and demanded the money from Gardner. He told me that he couldn't pay it and he didn't want the note to be pushed. He said if I would give him the note he would get Coover, his brother-in-law, a man of means, on the note as surety. I gave him the note and he gave me another one in its place, with his brother-in-law on as surety, and told me he would pay the note at a time I would need it ; I needed it all that time. This occurred about harvest ; I don't remember the year, but the circumstances I remember.

The following spring I told him I needed the money, and the arrangements were that he was to pay me that spring. In the spring, he got a party whose name was Nell—the first name I don't remember. He was to furnish the money. He said he would get Mr. Gorgas to go as surety for the money, which he was to get from Mr. Nell.

Mr. Gorgas refused to go in. Mr. Nell agreed that if Mr. George B. Heck, my brother John B. Drawbaugh, and myself, were to sign it as sureties, he would give the money. Mr. George B. Heck was to hold the original note as collateral security.

These parties mentioned, including myself, met at Mr. Gardner's house one evening, and the papers were closed ; that is, the note was signed, and Mr. George B. Heck neglected to take the old note as collateral.

In the morning, one of us called at Mr. Gardner's ; I think I called.

He said he was sorry he could not give the note; he had burned the note; that was the remark he made. I mean the old note that Mr. George B. Heck was to receive as collateral.

Q. 435. Had Mr. Nell let Mr. Gardner have the money on the new note the evening before?

A. Yes, sir.

Q. 436. And had Mr. Gardner paid the thousand dollars over to you the evening before?

A. I think so; I think he paid it that evening.

Q. 437. So that you had got the thousand dollars on Gardner's note to Nell by becoming surety with others on said last-mentioned note. Is that the fact?

A. Yes, sir; that is the fact.

[*Mr. Hill here offers in evidence a certified copy of certain docket entries, from the records and proceedings enrolled in the Court of Common Pleas, in and for the county of Cumberland and Commonwealth of Pennsylvania, said certified copy to be marked "Exhibit Drawbaugh judgments."*

Objected to by Mr. Storrow as an exhibit, and each and every part thereof, for the reason that the same does not appear to be a true copy of the records in the several cases referred to; and for the reason that it appears by the certificate, forming part of the exhibit, that said exhibit does not contain true copies of the whole of the records in said cases.]

Q. 438. In said exhibit, it appears that at the April term of said court, A. D. 1872, John B. Nell obtained a judgment against A. H. Gardner, Daniel Drawbaugh, George B. Heck, and J. B. Drawbaugh, upon a note stamped and dated April 1st, 1869, payable twelve months after date, with interest, etc. Please state whether or not the note therein referred to was the note which you signed as surety for the purpose of getting the one thousand dollars from Gardner, as you have testified?

A. Yes, sir; that was the note.

Q. 439. What did you do with the one thousand dollars which you got from Mr. Gardner, or from Mr. Nell, on the Gardner note, as you have testified?

A. I gave that to my father; he had purchased a farm.

Q. 440. Were your father and mother both living at that time, April 1, 1869?

A. Yes, sir; they were both living at that time.

Q. 441. How old were they at that time?

A. My mother was about seventy-five and my father about eighty-two; my father was about ninety-one when he died in 1878.

Q. 442. At that time, in April, 1869, was your mother of sound mind or not?

A. No, sir; she was not.

Q. 443. Did she continue of unsound mind till her death?

A. Yes, sir; and required a great deal of attention; there had to be some one all the time attending to her.

Q. 444. Had her mental condition anything to do with causing the old people to be moved out into the country on to a farm? If so, what?

A. Yes, sir; they had been living in Newville, and notwithstanding all their attention, she would get away sometimes, and get on to the railroad; and my brother Harry came to consult me, to see what was to be done.

He told me there was a farm for sale, that was considered a cheap farm; that my father had some money, but not enough to buy a farm, and that if I would give some money towards it, he would; that it was not safe to have our parents in town there.

My father would buy the farm and move on it, and he thought by that means we could keep them more economically, and that they would feel more satisfied away from town.

This conversation was before I had got the money from Nell, or before the arrangement between Nell and Gardner.

At that conversation I told him I would see; that Mr. Gardner owed me, and I would try to make arrangements to get that money.

At the same conversation we both agreed to let my father have the money, and to charge no interest for it.

Q. 445. Your father at that time was a very old man; was he able to do much in the way of helping to support himself, or not?

A. No, sir; I don't think he did any labor at all.

Q. 446. Did you ever afterwards get back any of that one thousand dollars that you put into that farm or not?

A. I think I got a little, but not much; the amount was very little. In some settlement and arrangement that my brother and I had, I received some, but the amount was very little.

I might find out, but I don't think it was a hundred dollars—some little settlement that my brother and I had about a distillery.

AMERICAN BELL TELEP

Q. 459. When and how did Samuel M. Hertzler pay his one thousand dollars?

A. As near as I can remember now, he paid me the biggest proportion in cash and the balance within a few months; it was all closed up within six months, as near as I can recollect.

Q. 460. Out of that money which you received from Mr. Hertzler at that time, was any portion of it lost? If so, how?

A. Yes, sir; there was a portion. There was a gentleman living at my place there—at Eberly's Mills—spoke to me about purchasing some apples at Williamsport—said there was a large speculation in apples. He said if I would furnish him four hundred dollars, he would give me a large percentage. He said he would give me the half of the profits, which he had figured up to a large amount. I got that amount—four hundred dollars—from Mr. Hertzler, and gave it to Mr. George Miller, the man referred to. He went to Williamsport, and arrived there in the night. When getting off the train, he was caught in some way by the train—or it was supposed so—and was killed. He was found in the morning dead; the money was found on his body. He had a memorandum of four hundred dollars from me. The expenses occurring there, coroner and jury expenses, were paid out of that money. The coffin was also paid out of it. I paid a man by the day for going up for the body, and also paid all his expenses. I never kept any account of the money paid out, but, to the best my recollection, it was a hundred dollars or more. The balance I got back, but I don't remember the amount.

Q. 461. Please look at the promissory note which I now show you, and state whose signature is attached to that note.

A. John Sheely's signature is attached to that note; the same John Sheely above referred to.

[*By consent, the following copy of the note and its indorsements is put in evidence, the original to be produced when called for*:

"*May* 24*th*, 1867.

U. S.
Internal Revenue
Stamp for 20 cts.

U. S.
Internal Revenue
Stamp for 20 cts.

Sixty days after date I promise to pay to the order of Daniel Drawbaugh, eight hundred dollars, without defalcation, for value received.

$800. JOHN SHEELY."

The indorsements on the back of the note are as follnws: "Rec'd

Dec. 24, 1867, of John Sheely, in part payment of within note, the sum of two hundred dollars.

$200. DANL. DRAWBAUGH."

U. S.
Internal Revenue
Stamp 2 cts.

"$400.00.

February 1st, 1868, received on the within note four hundred dollars. DANL. DRAWBAUGH."

U. S.
Internal Revenue
Stamp
2 cts.

"March 31st, 1868, received on the within note two hundred dollars.
DANL. DRAWBAUGH."

The note also bears the endorsement "J. Sheely," across the back a little below the middle.

FRED. M. OTT,
Examiner.

Q. 462. For what was that note given by Mr. Sheely?

A. For the balance due on his one-sixth interest in the "Pump Company," in addition to two hundred dollars which he paid in cash at the time.

Q. 463. This note, dated May 24, 1867, has indorsed upon it the following payments: Dec. 24, 1869, $200.00; February 1, 1868, $400.00; March 31, 1868, $200.00; were those payments made at the times referred to?

A. Yes, sir; I suppose so. My recollection is guided by the note.

Q. 464. Were those indorsements made at the time, as the money was paid?

A. Yes, sir; that is my recollection.

Q. 465. The note shows no payment of any interest. Is it the fact that Mr. Sheely paid no interest on the note?

A. Yes, sir; that is the fact; the interest was demanded, but he refused to pay it. He stated that he had lost enough in the Company, and thought I should give him clear.

Q. 466. Did you put the note in the hands of a collector or not?

A. Yes, sir; I did. I gave it to A. B. Shank for collection. He did not make the money. Mr. Shank returned the note and told me what I have stated before. I also saw Mr. Sheely myself. I don't remember whether it was after or before Mr. Shank returned the note. I think it was after Mr. Shank returned the note, but I won't be positive.

Q. 467. Please look at another promissory note which I now show you, and state whose signature is attached to it?

A. The signature of Henry S. Rupp, above referred to.

[*By consent, the following copy of the last-mentioned note, and its indorsements is put in evidence, the original to be produced when called for.*]

"*May* 24, 1867.

U. S.
Internal Revenue
STAMP.
40 cents.

Sixty days after date I promise to pay to the order of Daniel Drawbaugh, eight hundred dollars, without defalcation, for value received.

$800. HENRY S. RUPP."

The indorsements on the back are as follows:

U. S.
Internal Revenue
STAMP.
2 cents.

Rec. Jan. 14, 1868,
Two hundred dollars
on within note.
DAN'L. DRAWBAUGH.

Re'd April 16, 1868, Four hundred dollars on the within note.

DAN'L. DRAWBAUGH.

Rec'd April 16, 1868, twenty-two dollars, being the interest in full on within note until May 1, 1868.

DAN'L. DRAWBAUGH

Received March 30th, 1869, Two hundred dollars on the within note.

DAN'L. DRAWBAUGH."]

Q. 468. By the indorsements on this last-mentioned note, it appears that the following payments were made thereon, to wit: January 14, 1868, $200; April 16, 1868, $400; April 16, 1868, $22 interest;

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March 30, 1869, $200. Were those indorsements made at the times when they are respectively dated, and do they state correctly the several payments on the note?

A. Yes, sir; I believe so.

Q. 469. Was that note given for the balance of Mr. Rupp's purchase-money of one thousand dollars above referred to?

A. Yes, sir.

Q. 470. Then he paid two hundred dollars before or on the date of the note, did he?

A. Yes, sir; on the date of the note, to the best of my recollection.

Q. 471. The indorsements on the note indicate that all the interest was never paid on it. Is that the fact or not?

A. Yes, sir; that is the fact. I had given that note to Mr. Shank for collection, and Mr. Rupp declined paying.

Q. 472. Did Mr. Hertzler pay a portion of his in cash and the balance in notes?

A. I think he did. I think he paid two hundred dollars in cash and the balance in notes; but I won't be too positive about the notes. He paid me the whole amount within a few months. I have not found any of Hertzler's notes among my papers.

Q. 473. In your answer to a former question, you conveyed the impression that Hertzler paid the largest amount of his thousand dollars in cash. Upon reflection, what is your memory about it, whether it was two hundred dollars cash down or more?

A. I wasn't positive to any particular amount, and I am not now; but I am positive that he paid me the full amount within some months —two, three, four, or perhaps six months.

Q. 474. How did Mr. Hursh, at the time of the purchase, make his payments? Did he give notes for the entire amount or did he pay any portion of it in cash?

A. To the best of my recollection, he gave me two notes—a two-hundred-dollar note and an eight-hundred-dollar note.

Q. 475. Did he afterwards pay those notes? If so, how?

A. Yes, sir; he got money out of the Mechanicsburg First National Bank. He threw a note in there and I indorsed it; that is to the best of my recollection.

Q. 476. Did he pay that note to the Bank at its first maturity or was it renewed from time to time?

A. He didn't pay it. It was renewed a number of times; I couldn't say how often; I mean he didn't pay it at maturity.

Q. 477. When the note was originally put into Bank and discounted, you received the proceeds, I suppose. Is that the fact?

A. Yes, sir.

Q. 478. Do you remember what you did with the thousand dollars that you got on the discounted Hursh note?

A. Yes, sir; I paid that on a property that I bought from one Elisha T. Hauck.

Q. 479. What property was that that you bought from Hauck?

A. A dwelling-house and blacksmith-shop in Milltown, that I afterwards sold to Daniel Fettrow.

Q. 480. When did you buy that real estate?

A. I think I contracted in the fall of 1867, and got possession in the spring of 1868.

Q. 481. Did you get the proceeds of that discount and pay it over on the real estate before you got possession of the real estate, or not?

A. About the time I got possession, as near as I remember; I don't remember the number of days before.

Q. 482. What was the amount of the purchase-money which you were to pay for that real estate?

A. Twenty-three hundred and ten dollars.

Q. 483. When did you get your deed of that real estate—before, or after, or about the time that you got possession of the estate?

A. About the time I got possession. The rule is there that on the first of April deeds are delivered, or about the first—within a few days.

Q. 484. How much money did you pay on that real estate before or at the time when you got the deed?

A. The full amount, with the exception of a judgment of about three hundred dollars, as near as I can recollect now.

Q. 485. Against whom was that judgment rendered originally?

A. Against Elisha T. Hauck, in favor of Neidhamer; I forget his first name.

Q. 486. You bought the property, then, subject to that judgment, did you, and assumed the payment of that judgment yourself?

A. Yes, sir.

Q. 487. At the time when you sold the interest in the pump patent to Mr. Gorgas and others, as you have testified, did you owe any debts growing out of old transactions prior to that time or not?

A. Yes, sir.

Q. 488. Did you use any of the purchase-money paid you by Hertzler, Gorgas, Rupp, Hursh, or Sheely, in payment of those old debts? If so, to what amount, to the best of your recollection and knowledge?

A. Yes, sir; I did use money out of them payments; the amount I am not prepared to say, but to the amount of a thousand dollars or more, I am positive.

Q. 489. You have testified that you paid the one thousand dollars of the Hursh discount in part payment of your house and lot. Where did the remaining one thousand and ten dollars come from which you paid on that house and lot?

A. From payments on the notes above referred to, given by the parties in the Pump Company; that is the way I think it was. I don't know where else I would have got the money. That is my recollection of the fact.

Q. 490. When you made the sale of the interest in the pump patent to those parties, had you been, for several years before that time, doing a good business and making money, or what was the fact?

A. A number of years before that I was in business in manufacturing a stave-cutting machine. My principal trade in that was in the South. I thought at the time I was doing pretty well. I had a party selling for me in the South as an agent—selling a good many machines and territory; that was shortly before the breaking out of the Rebellion. Parties there had bought machines and owed me considerable money, some four or five thousand dollars.

This agent that was selling there collected a part of that money and kept it. That is, he stayed in the South and went into the Rebel army, and I have never heard of him since.

By that contract, I was entirely broken up, and had nothing; though I had a good many debts, I am sure of that. I never received a cent of that money after the starting of the Rebellion.

Q. 491. From the close of the war of the Rebellion, down to the time when you sold the interest in the pump patent to Gorgas and others, were you doing a good business and making money or not?

A. No, sir; I was not doing a good business.

Q. 492. When you received the money from Gorgas and others, as you have testified, what was the condition of your family and household supplies? Was it such that you had to apply a portion of the money immediately to that purpose or not?

A. Yes, sir; I was poor. I was in need of a good many necessary articles. I could not state the amount, but we used a considerable amount of that money for necessaries for the family.

Q. 493. You have heretofore testified that you used the money that you received from A. H. Gardner in purchasing a homestead for your parents. Did you use, for the benefit of your parents, any of the money which you received from Gorgas and others on their purchase of the pump patent. If so, to what amount, to the best of your recollection and belief?

A. I did; but the exact amount I could not state; to the best of my recollection, it was several hundred dollars. I don't suppose it was less than four hundred dollars.

Q. 494. What did you buy for your parents with that money, or how did you use it for them?

A. I bought, at different times, clothing; I bought a full set of furniture, the time when they went to housekeeping on the farm. I bought bedding, &c., and a great many different articles that I can't enumerate. I also gave my father money at different times, in addition to the Gardner money.

Q. 495. Did they go to housekeeping at about the time the farm was purchased?

A. Yes, sir; I think that same spring. I mean the same spring that possession was given of the farm; I think so.

Q. 496. That was the spring of 1869, was it not?

A. Yes, sir. I am guided by the papers; I don't remember the year. The bond for the purchase money was dated April 1, 1869.

Recess until 2 o'clock, P. M., for dinner.

December 22, 1881, 2, P. M.

Examination resumed pursuant to adjournment.

Present, Mr. Storrow for complainants and Mr. Hill and Mr. Jacobs for respondents.

Examination of Daniel Drawbaugh by Mr. Hill continued:

Q. 497. While you were a member of the Pump or Faucet Company, in which Gorgas and others were interested, as you have testified, you had certain assessments to pay in as a stockholder, did you not?

A. Yes, sir.

Q. 498. The testimony of Mr. William L. Gorgas, printed in defendants' records, pages 678, 679, [649, 650,] etc., shows that you paid in, as instalments and assessments into that Company, in actual cash, the sum of twelve hundred and ten dollars, as follows, to wit: June 27, 1867, $250; July 6, 1867, $50; July 22, 1867, $100; November 11, 1867, $200; January 20, 1868, $350; May 5, 1868, $250; June 10, 1868, $10. Where did you get the money to pay these several instalments, amounting to $1,210?

A. The time that has elapsed since is a good while. I don't remember where I got the money to pay the different instalments. One of the instalments, I remember, I borrowed money to pay. I won't say one, it might have been one or two, I borrowed money to pay instalments. It occurs to me that the instalments were more than what you read there. If my memory serves me, I borrowed five hundred dollars from one David Ditlow; or between four and five hundred dollars.

I went to see Mr. Ditlow a few weeks ago, to find out the amount, as I had forgotten it. He thought it was about three hundred dollars. I know I paid it back to him in partial payments, and sometimes I gave him new notes for the balances. I paid him the last balance of about sixty dollars, about a year ago, in the latter part of the summer or fall.

Q. 499. What is the best of your recollection and belief as to where you got the rest of the money from, that you paid to the Company in assessments and installments, up to June 10, 1868?

A. To the best of my recollection and belief, I got it from the parties who had purchased interests and given me their notes. It was part of the purchase-money which they paid me for their interests.

Q 500. What financial resources had you at that time, if any, except the money which those gentlemen paid you for their interests, and except your daily wages?

A. No other.

Q. 501. Mr. William L. Gorgas testifies, on pages 679 and 680, [650 and 651,] of Defendants' printed record, that from the time of the organization of the said Company down to July 19, 1873, labor done by you for the Company to the amount, $976.33, was not paid for in cash by the Company, but the amount was credited to you upon instalments and assessments due from you to the Company, in addition to the said $1,210. Does that accord with your recollection or not?

A. There was wages held back for instalments, but the amount I do not remember.

Q. 502. Out of that amount, $945, seems to have been earned prior to March 1, 1871, which would show that the Company held back an amount somewhere in the neighborhood of $300 per year from your wages. How does that amount compare with the total amount per year that your wages would come to?

A. I don't understand the question.

Q. 503. I will get at it in another way. Do you remember, or can you tell, about how much your wages came to per year, while you worked for that Company in 1868, 1869, and 1870, down to March 1st, 1871?

A. I cannot; I could if I had not lost the book that I kept those accounts in; I don't remember the amounts.

Q. 504. Were you hired by the day, the month, or the year?

A. By the day.

Q. 505. What were you to have per day as wages?

A. To the best of my recollection, it was $2.00 per day I was to have.

Q. 506. Do you recollect whether you worked continuously for them or not, and, if not, have you any idea of how much time you lost?

A. I did not work continuously for them, but I don't remember exactly and could not state—but there was times that I worked on other improvements, and there was times when the Company stopped work, that they gave me permission to do work for myself in the shop while the Company was not operating.

Q. 507. Do you recollect whether you did much work for them after March 1, 1871, the date when the last labor was credited up to you or not?

A. I don't think I did; I don't remember, though, clearly.

Q. 508. After you ceased working regularly for the Company, and during the years 1871, 1872, and down to July, 1873, when the Haucks purchased the business, did you have any regular and steady employment, on wages or salary, or any regular and steady income, or not?

A. No, sir; I had none. I had no regular and steady employment and no income, except from what odd jobs I would do in that shop for myself.

Q. 509. Why did you borrow money from Mr. Ditlow to pay the instalment that you referred to?

A. I was compelled to pay the instalments, or else I would have lost my interest in the Company.

Q. 510. Do you remember whether you used all the money that you borrowed from Ditlow for paying one instalment, or whether you used any portion of the borrowed money for any other purpose?

A. I don't recollect distinctly how much of the money borrowed I used for paying instalments. I may have used some of the borrowed money for the maintenance of my family.

Q. 511. Do you remember whether, about the time that you borrowed that money, you were hard-pressed to provide for the support of your family or not?

A. Yes, sir; I was. I know that.

Q. 512. Was that money borrowed at about the time when one of those instalments was paid to the Company, as shown by the books?

[*Objected to by Mr. Storrow as leading.*]

A. I think it was. I have a circumstance that I remember of. Mr. Gorgas came to me and told me that there was an instalment due that I should pay. I told him I didn't have the money, and he wondered if I hadn't better borrow it. I told him I didn't know where to borrow. He said he thought he could make arrangements that I could get it from Ditlow; that he would see Mr. Ditlow, and he did; and afterwards he told me he had seen Mr. Ditlow, and Mr. Ditlow said he would let me have the money. The money was paid immediately to the Company, but I don't remember that I paid in all the money that I got from Ditlow. I don't remember the exact amount.

Q. 513. The last instalment, exceeding ten dollars, which you paid into the Company in cash, was on May 5, 1868, when you paid in $250. I have in my hand a note dated April 4, 1870, for $200, with interest. Was said note made at the time when you borrowed the money, or was it one of the extensions or renewals that you referred to in your testimony a little while ago?

[*Objected to by Mr. Storrow as leading.*]

[*Question withdrawn by Mr. Hill.*]

Q. 514. Please look at another promissory note which I now hand you, and state whose signature was attached to that note, and whether the note was made at the time of its date, April 4, 1870.

A. It was my signature attached to the note; the place for the signature has been torn off. The note was made April 4, 1870. I don't remember the date, but I go by the face of the note.

Q. 515. Was that note an original note or a renewal?

A. I think it was a renewal. My impression is that the original note was for between four and five hundred dollars.

Q. 516. Why did you renew the note at that time? Didn't you have money enough to pay it?

[*Objected to as leading.*]

[*Question withdrawn by Mr. Hill.*]

Q. 517. Why did you renew the note at that time? Did you have money enough to pay it?

[*Objected to as leading.*]

A. I renewed it because I didn't have the money to pay it.

[*By consent, a copy of the note and its indorsements is put in evidence, the original to be produced when called for, as follows:*]

"$200.00. Eberly's Mills, Penn'a., Apr. 4, 1870. One year after date we, or either of us, promise to pay to David Ditlow, or order, two hundred dollars without defalcation for value received with interest from date."

[U. S. Int. Rev. Stamp. 10 cts.] [Signature torn out.]

"March 27, 1871, received twelve dollars on within note.

DAVID DITLOW."

"April 1st, 1872, received on within $12.00 for interest."

"April 1st, 1873, received on within $12.00 for interest."

Q. 518. Did that note grow out of the transaction of your borrowing money from Ditlow to pay the instalments, as you have testified?

A. Yes, sir.

Q. 519. Please look at another promissory note which I hand you, dated April 9, 1874, and state whose signature was attached to that note, and when and for what it was given.

A. It was my signature; a portion of the letter D still remains; the rest has been torn off. The body of the note is in my handwriting. It was given April 9, 1874; it was given for a balance that remained unpaid on the other note, last referred to.

Q. 520. When was this last note of April 9, 1874, finally paid?

A. About a year ago, or a little more.

[*By consent, a copy of the note and its indorsements is put in evidence, the original to be produced when called for, as follows:*]

"$50.00. *April 9th*, 1874.

Six months after date I promise to pay unto David Ditlow fifty dollars, without defalcation for value received.

D "

[*This part of note torn off.*]

The indorsements on the back of said note are as follows:

"*April* 1, 1876.

Received upon the within note $2.00."

"*April 2nd*, 1877.

Received on the within note, intres. $4.00."

Q. 521. At the time when you purchased the dwelling-house, lot, and smithy, at Milltown, as you have testified, what was the condition of the house as to repair?

A. It required considerable repair. I weather-boarded the whole outside of the building, put up a new porch, and other repairs that I don't remember now. I put a new roof on part of the house. I painted the house on the outside and repainted some of the rooms.

Q. 522. How much did those repairs, at that time, come to, to the best of your recollection and belief?

A. I could hardly state. I suppose between three and four hundred dollars. I may be able to find out what the amount is from the bills, if they are not lost. I think there are bills, that I may find.

Q. 523. Was that the first dwelling-house that you ever owned?

A. Yes, sir; it was.

Adjourned until December 23, 1881, at ten, A. M.

December 23, 1881, ten, A. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Examination of Daniel Drawbaugh by Mr. Hill continued:

Q. 524. For several years prior to the purchase of the faucet business by the Haucks, in July, 1873, had you been able to earn money enough to pay your necessary living expenses and keep from getting in debt or not? State the facts upon that subject.

A. No, sir; I was not able to keep out of debt. I know I was very hard up during all that time.

Q. 525. It appears from the testimony of William L. Gorgas, on behalf of Defendants, as printed on page 683 [654] of Defendants' printed record, that on July 19, 1873, the sum of four hundred and twenty-five dollars was paid to you by the Faucet or Pump Company, out of the proceeds of the sale to the Haucks; is that in accordance with your recollection or not?

A. I remember of them paying me money, but I have forgotten the amount; but I believe that to be correct.

Q. 526. You have testified that you bought the Milltown homestead, subject to a judgment of $300, in favor of one Neidhamer. Do you remember whether that Neidhamer judgment was paid before you got your share of the Hauck money, July 19, 1873, or not?

A. I don't think it was, to the best of my recollection.

Q. 527. I wish to know whether you used any of the said $425 in payment of that Neidhamer judgment or not. What is the fact?

A. I did. I am under the impression that I paid a part of that judgment—several hundred dollars—out of the money that I received from the Hauck purchase. I went to see the agent of Neidhamer, named Wells—I think his first name was James—he told me that the judgment was all paid at one time. I did not recollect that, but whatever was paid, was paid out of that Hauck money; I am positive of that.

Q. 528. Do you recollect whether or not the judgment was fully paid off and satisfied by that payment?

A. I didn't remember that it was at that time. The date I didn't remember, but I know it was paid and satisfied about that time.

Q. 529. Perhaps you did not fully understand my question. You have testified that you paid some of the Hauck money on that Neidhamer judgment. What I now want to know is this, to wit: whether that payment which was made with the Hauck money was the last payment on the

Neidhamer judgment, and which satisfied and discharged said judgment?

A. I don't remember that. The way I recollected was that I had paid the greater portion of it. I went to see him, and he said it was all paid at one time; and, if that is so, I am satisfied it was all paid out of that money.

Q. 530. Do you recollect whether they were pressing for the money on that judgment at the time when you made that payment or not?

A. Yes, sir; and before. He had asked me a number of times; that is, a year or two before.

Q. 531. Why had you not paid it when he asked you before?

A. For the reason that I didn't have the money.

Q. 532. Had the interest accumulated on that judgment, or had you kept it down?

A. I paid some interest on it—the first year or two; afterwards there was interest that I did not pay. Part of the interest I know was satisfied at the time I made the payment—at the time the judgment was satisfied.

Q. 533. Please look at the receipt I now hand you, dated July, 1873, and state whose signature is attached to it, and what transaction it relates to.

A. It is Dr. J. D. Bowman's signature, and relates to the receipt of money on a judgment bond that he held against me.

[*By consent, the following copy of the receipt is put in evidence, the original to be produced when called for:*]

"Rec'd July, 1873, of Dan'l Drawbaugh, forty-five dollars on judgment bond.

J. D. Bowman."

Q. 534. Do you recollect whether you paid that money out of the money you received from the Hauck sale?

A. Yes, sir; I did.

Q. 535. In whose handwriting is that receipt?

A. It is the same handwriting as the signature—that of Dr. Bowman,—in my judgment. I think he wrote it at the shop. I remember of paying him the money and getting a receipt, but I didn't remember of him writing it.

Q. 536. How came you to be indebted to Dr. Bowman at that time?

A. For medical attendance. He was my family physician for several years.

Q. 537. In "Exhibit Drawbaugh judgments," I find a judgment entered up in February, 1873, in favor of Dr. Bowman against you, for $122.67. Was that the judgment on which that $45 was paid?

A. Yes, sir.

Q. 538. Please look at this other receipt, dated August 1st, 1873, which I now show you, and state in whose handwriting it is and whose signature is attached to it?

A. It is the signature of Dr. J. D. Bowman; I take the body of the receipt to be in his handwriting. It is for $45.

[*By consent, the following copy of said receipt is put in evidence, the original to be produced when called for:*]

"$45.

Rec'd August 1st, 1873, of
Daniel Drawbaugh,
Forty-five dollars on note of 1872.
J. D. BOWMAN."

Q. 539. Why did you not pay Dr. Bowman for his professional services as they were rendered, instead of allowing his bill to run up and him to recover a judgment against you?

A. Because I didn't have the money. I had no other reason.

Q. 540. Please look at another receipt which I now hand you, dated July 24, 1873, and state whose signature appears to it, and when and for what the money was paid.

A. G. W. Beelman's signature; that is a bill of $7 20 that I paid for groceries. The money was paid at the time the receipt is dated. I don't remember when it was contracted for.

[*By consent, the following copy of said receipt is put in evidence, the original to be produced when called for:*]

"HARRISBURG, *July* 24, '73.

MR. DANIEL DRAWBAUGH,

Bought of G. W. BEELMAN.

½ bbl. No. 2 mackerel,	$4 75
Empty half bbl.,	15
Aug. 1, 13½ lb. of ham @ 17,	2 30
	$7 20

Rd. pymt.,
G. W. BEELMAN."

LEPHONE COMPANY,-2

Q. 541. One item of the bill is charged as of August 1. Do you remember what August that was?

A. I do not; but it might have been a previous bill—a year before that; I don't remember.

Q. 542. Might this bill, or might it not, have been paid about the first of August, 1873, its real payment being shown by the last date instead of the first?

A. I couldn't say. I don't know whether it was or not. It might have been.

[*The examiner by consent certifies that the last item of the bill, with the footing, the words "Rd pymt" and the signature, appears to be written with the same kind of ink, which is slightly different in color from that used in the body of the bill.*]

Q. 543. Please look at the promissory note which I now show you, dated April 26, 1873, and state whose signatures are attached to the note, and who paid the note.

A. George W. Kissinger's signature and mine. I paid the note.

Q. 544. That note became due May 26, 1873. Do you remember whether it was paid at maturity or afterwards?

A. I couldn't positively state when it was paid, but I think it was paid at the time I got that Hauck money. I know it would have been paid if it had been presented, and Mr. Leonard is a man who generally presents bills pretty often.

Q. 545. How came you to make that note? What was the transaction?

A. I bought my flour and feed from Mr. Leonard. I think it was contracted in that way for flour and feed out of the mill.

Q. 546. How came Kissinger to sign it?

A. I have forgotten that. Part of it may have been a bill that I owed Kissinger in the store. I don't know why he should have signed it, unless he was security; I don't know.

[*By consent, the following copy of said note is put in evidence, the original to be produced when called for:*]

"$60.00. *April* 26, 1873.

Thirty days after date, for value received, we promise to pay Geo. Leonard, or bearer, the sum of sixty dollars, with interest, and without defalcation or stay of execution. And we do hereby confess judgment for the above sum, with interest and all costs of suit, a release of all errors, and waiver of all rights to inquisition and appeal, and to the benefit of all laws, exempting real or personal property from levy and sale.

GEO. W. KISSINGER,
DANL. DRAWBAUGH."

[NOTE.—*The names are cancelled by XX marks.*]

Adjourned until Wednesday, December 28, 1881, at 2.30, P. M.,

When, on account of the death of the son of Mr. Drawbaugh, a further postponement until January 10, 1882, was agreed upon by counsel.

January 10, 1882, 10 *o'clock*, A. M.

Examination resumed pursuant to adjournment.

Present, Mr. Smith and Mr. Storrow for complainants, and Mr. Hill and Mr. Jacobs for respondents.

Examination of Mr. Daniel Drawbaugh by Mr. Hill continued:

Q. 547. From the time when the Haucks made their purchase in July, 1873, to the time when you moved to Mechanicsburg, about the 1st of April, 1876, what was your financial condition—were you or were you not making money enough to pay your necessary expenses and keep even with the world?

A. No, sir; I wasn't making sufficient money to keep my family. I was making debts—had contracted debts before that, was contracting them all the time, and couldn't meet them.

Q. 548. Daniel Fettrow, a witness on behalf of Defendants, has testified in effect, that he purchased your blacksmith-shop and dwelling-house, at Eberly's Mills, and got the deed thereof on the first of April, 1876. That the terms of sale were to be cash on April 1st, 1876, less the amount of incumbrances; and that the agreement for the sale was made in August, 1875. Is that substantially in accord with your recollection or not?

A. Yes, sir; with the exception that I had forgotten the day of making the contract; I didn't remember the day, but it was about that time.

Q. 549. I have in my hand a small paper containing two separate writings, one of which purports to be a receipt and the other a promissory note. Will you please examine the paper and state if you know in whose handwriting it is, and by whom the note and receipt were signed?

A. The upper part, or receipt, is in the handwriting of my brother, J. B. Drawbaugh, and signed by myself—Daniel Drawbaugh. The note is in my handwriting and signed by me.

[*By consent, a copy of said receipt and note is put in evidence, as follows, the original to be produced when called for:*]

"Received Eberly's Mills Sept. 2nd 1875, of Daniel Fettrow, fifty Dollars on Property.

Dan'l Drawbaugh.

Sixty Days after Date I promise to pay to Dan'l Fettrow one hundred Dollars with interest for value received.

January 28th, 1876. Dan'l Dra" [*this torn out.*]

Q. 550. State whether you received fifty dollars from Mr. Fettrow on the second day of September, 1875, as evidenced by said receipt.

A. Yes, sir; I did.

Q. 551. For what was the one hundred-dollar-note of January 28, 1876, given?

A. It was given to pay off money borrowed for paying on an article of agreement on property purchased from E. W. Wise.

Q. 552. What I mean is this—did you borrow a hundred dollars from Mr. Fettrow at that time, or was the note given to pay an antecedent debt to Fettrow?

A. I borrowed the money at that time, for the purpose of paying on an article of agreement for the purchase of property from E. W. Wise.

Q. 553. Please look at the note, which I now hand to you, and state in whose handwriting the signature is or was.

A. It is my handwriting, or was; "Dan'l" is there yet; the balance has been torn off.

[*By consent, a copy of the note and its indorsements is put in evidence, as follows, the original to be produced when called for:*]

"$\$125\frac{00}{100}$ Mechanicsburg, Pa., *Jan.* 1*st,* 1876.

Thirty days after date I promise to pay to the order of George Wise, at the First National Bank of Mechanicsburg, Pa., one hundred and twenty-five dollars, without defalcation, for value received. Credit the drawer.

DAN'L" [*this torn out.*]

[*The indorsement is as follows:*]'

"Received Jan. 29, 1876, on within note, Ninety-five Dollars.

E. W. WISE,
Pr Geo. Wise."

Q. 554. It appears that on the 29th of January, 1876, you paid Mr. Wise ninety-five dollars on account of said note. Where did you get the ninety-five dollars to pay Mr. Wise?

A. I got that from Daniel Fettrow. To the best of my recollection, that is the money I got on the note that was shown here previous to this last note.

Q. 555. Was that note to Mr. Wise made at the head of the article of agreement between Mr. Wise and you, to which you have referred above?

A. Yes, sir; I think it was.

Q. 556. After paying the ninety-five dollars upon that note, thirty dollars appear to have remained due upon it. Do you remember when that thirty dollars was paid?

A. I don't remember, but I think it was paid before the first of April, 1876.

Q. 557. Mr. Fettrow has testified that he was to pay twenty-two hundred dollars for the property which he purchased of you, and that he actually paid you twelve hundred dollars out of the twenty-two hundred dollars, but retained the balance by reason of incumbrances on the property. Is that in accordance with your recollection or not?

A. Yes, sir; it is. There was a judgment of a thousand dollars on the property, which he retained out of the whole amount of twenty-two hundred dollars.

Q. 558. Did he come to time with his payment of the twelve hundred dollars on the first of April, 1876, as he had agreed?

A. Yes, sir; he did.

Q. 559. Then, as he had already paid you fifty dollars in September, and loaned you one hundred dollars in January, I suppose the amount which you actually received from him on the first of April, 1876, was ten hundred and fifty dollars. Am I correct or not?

A. Yes, sir; the amount—the one hundred and fifty dollars—was deducted from the twelve hundred dollars.

Q. 560. Captain J. A. Moore has testified (defendants' printed record, page 649 [621]) that he paid you, on the first day of April, 1876, one hundred and nineteen dollars and ninety-four cents. Is that in accordance with your recollection ?

A. I hadn't remembered the amount, but I remember of him paying me money.

Q. 561. When did you complete the transaction of purchasing the Mechanicsburg property which you bought from Mr. Wise, and to which the agreement related, that you have spoken of?

A. I don't remember the date, but I think the date of the bargain was in the fall or winter of 1875. The transaction was completed, and I got the deed, on or about the first of April, 1876.

Q. 562. What amount of cash did you have to make up to Mr. Wise on the first of April, 1876, the day when you got that deed?

A. One thousand dollars, less the amount paid on the note of January 1st, 1876.

Q. 563. What amount did you agree to pay for the Mechanicsburg property ?

A. Seventeen hundred and forty dollars.

Q. 564. Then the deferred payments on that property amounted to seven hundred and forty dollars. Is that the fact ?

A. Yes, sir.

Q. 565. How was that deferred payment, or how were those deferred payments, amounting to seven hundred and forty dollars, secured to Mr. Wise ?

A. By three judgment notes, to be paid in three annual payments.

Q. 566. In "Exhibit Drawbaugh judgments," I find the record of three judgments, numbered respectively 580, 581, and 582, April Term, 1876, E. W. Wise *vs.* Daniel Drawbaugh, on three notes, dated April 1st, 1876, two of them being each for two hundred and forty-six dollars and sixty-seven cents, with interest, and the third being for two hundred and forty-six dollars and sixty-six cents, with interest Were those the three judgment notes referred to in your last answer ?

A. Yes, sir.

Q. 567. By an entry in said record "Exhibit Drawbaugh judgments," it would appear that, on the 9th day of April, 1877, two hundred dollars were paid to the prothonotary on said judgment, No. 580. Was that the fact?

A. Yes, sir.

Q. 568. Who paid that two hundred dollars to the prothonotary?

A. I did.

Q. 569. An entry in the same record shows that on the 6th day of April, 1878, sixty-seven dollars and twenty cents were paid in full satisfaction of that judgment, No. 580. Who paid that sixty-seven dollars and twenty cents?

A. I paid that.

Q. 570. Another entry in the same exhibit shows that on the 6th day of April, 1878, two hundred and thirty-two and eighty one-hundredths dollars were paid on said judgment, No. 581. Who paid that last-mentioned sum of two hundred and thirty-two and eighty one-hundredths dollars?

A. I paid that. The two payments were paid on the same day.

Q. 571. By an entry in the same exhibit, I find that Dr. J. D. Bowman had obtained a judgment against you, No. 99, of April Term of 1873, for one hundred and twenty-two and sixty-seven one-hundredth dollars, and costs and interest, which judgment was satisfied by a paper filed in the prothonotary's office April 3, 1876. Do you remember whether you paid something on that judgment at about that time, April 3, 1876, or not?

A. Yes, sir, I did; but I don't remember the amount I paid.

Q. 572. Did you then pay the balance that was due on the judgment, whatever that balance was at the time?

A. Yes, sir.

Q. 573. By the same exhibit, I find that D. H. Good had obtained a judgment against you, No. 139, of January Term, 1876, for twenty-seven and eighty-one one-hundredths dollars, with interest and costs, to wit: by the filing of a transcript of a Justice's judgment, dated September 6, 1875, upon which execution had been issued, and returned *nulla bona;* and that said judgment of the Cumberland Common Pleas was satisfied in full by a paper filed April 3, 1876. Do you remember whether you paid that last-mentioned judgment about that time or not?

A. Yes, sir; I remember that I did, but I didn't remember the exact amount of it.

Q. 574. Do you remember where you got the money with which you paid D. H. Good's judgment, and the balance of J. D. Bowman's judgment, above referred to?

A. Some money that I got from Captain Moore and Daniel Fettrow. I didn't have any other money; for that reason I know.

Q. 575. State whether or not you have any recollection of the condition of your accounts with George Leonard and with Dr. Criswell, at about the time when you received the money from Daniel Fettrow, early in April, 1876?

A. I owed them money. I think I paid Dr. Criswell, in April, about forty dollars; and I also paid Leonard, but I don't remember the amount I paid Leonard. I might state further that I often paid Leonard parts, but I don't remember whether I paid him the full amount of what I owed him that spring or not.

Q. 576. Do you recollect whether or not you let Dr. Criswell have anything on account, besides money, that spring?

A. I think there was a set of wagon axles, but I don't recollect whether that was included in the forty dollars, or not.

Q. 577. What is your best recollection and belief, as to the amount of money you paid George Leonard, at that time?

A. It may have been forty, fifty, or sixty dollars. I don't remember the amount, indeed.

Q. 578. After paying all these debts out of the money received from Mr. Fettrow and Captain Moore, as aforesaid, what did you do with the balance of that money left in your hands?

A. I may have bought necessary things for the family, and paid other floating debts. That didn't near pay all the debts I had at the time; not one quarter of the debts.

Q. 579. How long did that money last you after the first of April, 1876, before it was all paid out?

A. I couldn't exactly say, but I don't suppose I had a cent of it three weeks after I received it; because I know I contracted debts that spring; in fact, the same day that I moved to Mechanicsburg.

Q. 580. Did you move to Mechanicsburg before or after you received the money from Fettrow?

A. Before. It may be, a few days or a week before.

Q. 581. What was your financial condition from the first of April, 1876, till the latter part of March, 1878?

A. I needed money very badly; I know that.

Q. 582. State whether, during that time, you did or did not make enough money to support your family?

A. I did not.

Q. 583. Jacob E. Shettel has testified (page 220 [210] of Defendants' printed record) that on the first day of April, 1878, the Electric Clock

Company paid you five hundred dollars. Is that in accordance with your recollection, or not?

A. Yes, sir; they paid me that amount, I know.

Q. 584. We have already seen that on the 6th of April, 1878, you paid moneys amounting to three hundred dollars on the Wise judgments. Where did you get that three hundred dollars that you paid on the Wise judgments at that time?

A. That three hundred dollars was paid out of the money I received from the Clock Company.

Recess for dinner until 2 o'clock, P. M.

January 10, 1882.

Examination resumed pursuant to adjournment.

Present same counsel.

Examination of Daniel Drawbaugh by Mr. Hill continued:

Q. 585. I hold in my hand a note for $103 and interest, dated December 31, 1875, and payable to George Leonard. The signature is torn off, but the note is marked on the back "D. Drawbaugh note $103." Do you know what that note was for, and by whom it was signed?

A. That note was for a matter of goods that I got out of the mill —flour, feed, &c.; that was my signature; I know that; it is now torn off.

[*By consent, a copy of said note and its endorsements is put in evidence as follows, the original to be produced when called for:*]

"$103.00. HARRISBURG, PA., Dec. 31, 1875.

One day after date I promise to pay to Geo. Leonard, or assigns, the sum of one hundred and three one hundredth dollars, without defalcation, for value received, with interest. And further, I do hereby authorize and empower any attorney of any Court of Record of the State of Pennsylvania, or elsewhere, to appear for and enter judgment against me for the above sum of money, with or without declaration, with costs of suit, release of errors, without stay of execution, and with ten per cent. added for collecting fees; and also waive the right of inquisition on any real estate that may be levied upon to collect this judgment note, and I do hereby voluntarily condemn the same and authorize the prothonotary to enter upon the *fieri facias* our said" (*this, and signature torn off.*)

"and I do hereby further agree that said estate may be sold upon a writ of *fieri facias*, and I do hereby waive and release all relief from any and all appraisement" (*torn off*) "laws of any State now in force or hereafter to be passed, and I do also waive the benefit of the present and any future Bankrupt law that may be passed by the" (*torn off.*)

"Signed, sealed and delivered in presence of—" (*signature torn off*)

[*The endorsements on said note are as follows:*] "March 31, 1877, interest paid up till date." "April 3, 1878, paid on the within note fifty dollars."

"Paid on the within note ten dollars, Feb. 25, 1879."

"Paid on the within note twenty dollars, April 1, 1879."

Memorandum on the back: "D. Drawbaugh note, $103.00."

Q. 586. Do you know the handwriting in the body of the note and the endorsements?

A. I don't know. The first endorsements are in the handwriting of George Leonard, but the face of the note does not appear to be in the same hand. The last receipt on the back of the note is in my handwriting. All the rest are in that of Mr. Leonard.

Q. 587. One endorsement on the note represents that on the 3d day of April, 1878, $50 were paid on the note. Was that the fact or not?

A. Yes, sir; I take it by the note—I don't remember. I remember paying him money at so many different periods. That was money received from the Clock Company.

Q. 588. Did you ever have occasion to become indebted to Mr. W. S. Dellinger, for flour, feed, &c., from the mill while he was running it?

A. Yes, sir; I had owed him some pretty large bills.

Q. 589. What was the state of your account with him at the time the clock company paid you the five hundred dollars, to wit: April 1, 1878?

A. I paid him that spring in the neighborhood of a hundred dollars. It may have been a little more or a little less.

Q. 590. Where did you get the money to pay him?

A. That was from money that I got from the Clock Company.

Q. 591. How long after you got the money from the Clock Company was it that you paid Mr. Dellinger?

A. To the best of my judgment, in the course of a few days, or, perhaps, it might have been a week.

Q. 592. Please look at the receipt which I now show you, and state in whose handwriting it is, and by whom it is signed, and what transaction it refers to.

A. It is a receipt written and signed by Wilson Miller, a party who had a coal-yard at White Hill, near my place. That is for coal that I got, to the best of my recollection, in the fall or winter of 1877—1878.

[*By consent, the following copy of said receipt is put in evidence, the original to be produced when called for:*]

" *White Hill*, Cumb. Co., Pa., *Apr.* 3 1878.
Mr. Daniel Drawbaugh. Bought of [Dan. Drawbaugh crossed out] *J. R. Miller.*
Practical machinist, small machinery; patent office models, electric machines, &c., a specialty.
Coal & Freight 12.20.

Received Payment,
J. R. Miller,
pr. W. Miller."

[*This is written on a printed bill-head of Daniel Drawbaugh. The parts above printed in italics are in manuscript. The printed words,* "*Dan. Drawbaugh*" *after* "*Bought,*" *are crossed out with a pen, and the words J. R. Miller written in place of them.*]

[*Memorandum on back,*] "Receipt of Wilson Miller."

Q. 593. Do you recollect where you got the money to pay Mr. Miller, as set forth in that receipt?

A. I suppose it was money I got from the Clock Company. I know I didn't get any other money that spring.

Q. 594. Here is another receipt, dated April 3, 1878, the same day as the last one. In whose handwriting is this receipt, which I now show you, and its signature?

A. I don't know whose handwriting the body of the receipt is. The signature is that of Jeremiah Fry. That is money I paid him out of that money I got from the Clock Company. I am confident of that; I remember paying him.

[*By consent, the following copy of said receipt is put in evidence, the original to be produced when called for:*]

"April the 3, 1878.
Received of Daniel Drawbaugh, Four Dollars and thirty-one cents in full on settlement up to Date.

JEREMIAH FRY."

[*Memorandum on back,*] "Receipt of Jery Fry."

Q. 595. After paying out of the $500 received from the Clock Company the various sums above mentioned, amounting in all to over $460, what did you do with the remainder of the Clock Company money, amounting to from $30 to $40?

A. I suppose I paid some other small debts, and bought, perhaps, some necessary things for my family; I can't just remember.

Q. 596. Mr. Jacob E. Shettel has testified, on page 220 [210] of Defendants' printed record, that about a week or ten days after the Clock Company paid you the $500, you told him that you didn't have $5 left out of the whole $500. Do you recollect making that statement to him?

A. Yes, sir; while I was driving over this bridge in a buggy; he also loaned me a small sum of money, too, at the same time;—I mean the bridge across the Susquehanna, called the "Harrisburg bridge."

Q. 597. Was the statement true?

A. Oh, yes; certainly, it was true.

Q. 598. I have here, a note dated March 13, 1877, for $15.50, payable to John Rennard, eleven months after date; the signatures are torn off, but the note is marked "D. Drawbaugh," on the back. By whom was that note signed, and what was it given for?

A. That note was signed by me, and countersigned, or signed again, by J. B. Drawbaugh, my brother; it was given for two hogs, or rather, pigs, that I bought at a public sale; the note was in the Mechanicsburg Bank; I didn't pay the note when it matured, but paid it in the spring of 1878.

Q. 599. Why did you not pay it at maturity?

A. I don't suppose I had the money.

[*By consent, the following copy of said note, and its endorsements, is put in evidence, the original to be produced when called for:*]

"$15.50. MECHANICSBURG, PA., *March* 13, 1877.

Eleven months after date, we or either of us promise to pay to the order of John Rennard, at the First National Bank of Mechanicsburg, Pa., the sum of Fifteen dollars and 50 cts. without defalcation, for value received, with reasonable fees for collection, if not paid at maturity.

DANL. [*this torn off.*]
J. "

[*Endorsed*] "John Rennard."

[*Memorandum on the back,*] "2047, D. Drawbaugh, $15.^{50}$ Feb. 16."

Q. 600. Do you remember where you got the money with which you paid that note?

A. No; I don't remember; it may have been money that I got from the Clock Company; I don't know of any other.

Q. 601. Mr. E. W. Chellis has testified, that, early in January, 1879, about the time that he went into the faucet business with you and Dr. Moffit, you told him you must have $250, as you were in debt and they were pressing you for money that you owed, and that he thereupon gave you a check for $250, on the 7th of January, 1879; do you remember that transaction?

A. Yes, sir; I do.

Q. 602. Do you remember what you did with that money?

A. I used it for paying debts, and for some necessary things for my family, too; I used some of it for clothing for myself and family.

Q. 603. How long was it before you were out of money again?

A. I don't know; it wasn't very long.

Q. 604. Do you recollect having to borrow small sums from Chellis afterwards?

A. Yes, sir; quite a number of times—from a half dollar to five dollars at a time.

Q. 605. What is your recollection, as to how long it was after you got the $250, before you had to borrow from Mr. Chellis again?

A. I don't think it was a week—hardly a week.

Q. 606. A mortgage dated April 19, 1879, is recorded in the office of Recorder of Deeds in Cumberland County, Pennsylvania, in which you mortgaged your Mechanicsburg property to Mr. E. W. Chellis for $337; what was that transaction, and why did you have to mortgage your property to Mr. Chellis to secure him $337, at that time?

A. To procure money to pay the last, and a portion of the second judgment on the Mechanicsburg property.

Q. 607. What became of that last judgment on the Mechanicsburg property; that is to say, the last of the Wise judgments; was it paid, or was it assigned to Chellis?

A. It was paid; it wasn't assigned to Chellis; I gave him a mortgage for the amount, $337; that is the way I understand it.

Q. 608. It has been stated, that, at times heretofore, you have assisted other inventors in drawing applications for letters patent upon their inventions; is such the fact?

A. Yes, sir; I did; I assisted in a few cases.

Q. 609. How much money did you get for that sort of work?

A. I don't remember how much; I remember that in two cases, I got $20 each, for making the drawings and writing the specifications; the specifications were re-written after I had written them.

Q. 610. Did you ever act as attorney for any other inventor, in doing his business at the Patent Office?

A. No, sir; not to the best of my recollection; I did not.

Q. 611. So far as you prepared specifications of other inventors' inventions, was it for the purpose of filing in the Patent Office, or for the purpose of assisting their Attorneys in properly getting at their inventions?

A. In two cases it was for the purpose of filing; that is, I made the drawings and wrote the specifications, and they made their applications themselves.

Q. 612. What were those inventions in those two cases?

A. The one was a check spring for a wagon, to support weak springs—to support an elliptical spring; the other was a journal for a reaper bar; I think it was styled a reaper bar attachment.

Q. 613. Were those two specifications filed in the Patent Office as you wrote them, or were they afterwards amended by others?

A. I cannot say; that I do not know; the spring, I think, was applied for as I drew it, but the other I cannot say.

Q. 614. You have taken out a number of patents yourself; state whether or not you ever drew a specification to be filed in the Patent Office, on any of your own inventions?

A. No, sir; I never did.

Q. 615. State whether or not you ever took out a patent with your own money?

A. I never did.

Q. 616. In taking out a patent, how did you obtain the money for paying the Government fees, and for procuring the services of an Attorney to do the work?

A. I would give an interest out to other parties, for furnishing the money to procure the patents.

Q. 617. Why did you take that course in procuring your several patents?

A. To get the money for taking out the patent.

Q. 618. Were you obliged to do it, in order to get the money to take out the patents?

A. Yes, sir; for I didn't have the money.

Q. 619. How much schooling did you ever have in your life?

A. I could hardly say; three, four, or perhaps five winters; that is, sometimes just part of a winter.

Q. 620. How old were you when you last went to school?

A. As near as I can remember, I was fifteen or sixteen years old; I may not have been as old.

Q. 621. Did you go to an Academy or High School, or only to a Common School?

A. Just Common Schools; and when I went they were very common.

Q. 622. Why did you never draw specifications to be filed in the Patent Office on your own inventions?

A. I didn't think I was competent for drawing good specifications; that is as near as I can state it.

Adjourned until January 11, 1882, at ten, A. M.

January 11, 1882, ten o'clock, A. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Examination of Daniel Drawbaugh by Mr. Hill continued:

Q. 623. Mr. Jacob H. Renneker has testified, (page 247 [236] of Defendants' printed record,) that in May, 1877, you wanted to trade him, and did trade him, a bureau and secretary combined, for provisions for your family; do you remember that transaction?

A. Yes, sir; I do.

Q. 624. Why did you trade off your bureau and secretary at that time?

A. I needed provisions for my family.

Q. 625. Had you no means to get such provisions, except by trading away your household furniture?

A. No, sir; not at that time—I can't—I had no other means.

Q. 626. From the time when you exhausted the $500, which you received from the Electric Clock Company, down to the middle of the year 1880, were you laying up money, or did it take all that you made to pay your living expenses?

A. I didn't lay up any money. I didn't make enough to keep my family, in that time.

Q. 627. What was your condition, as to being in debt or free from debt during that time?

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A. I was in debt all the time, and contracting more.

Q. 628. State whether, from the time when you borrowed the money from Mr. Ditlow, to pay the installment called for by the Gorgas Faucet Company, or old Drawbaugh Pump Company, as you have testified, down to the middle of the year of 1880, there was, or was not, any time during which you were unembarrassed by debt?

A. There was not. I was in debt all that time.

Q. 629. During that time, or any part of it, did you ever contemplate selling your little homestead to realize means to pay your debts, and to relieve yourself in your business?

A. Yes, sir; I did. I spoke to my wife with respect to it, but she wouldn't consent unless I would sell and buy another place.

Q. 630. When was that, that you spoke to her about it? Was it before or after you sold the Eberly Mills homestead and bargained for the Mechanicsburg place?

A. Before—a number of years before that, I had contemplated selling. I had offered it a number of times to different parties.

Q. 631. When you consulted her about selling, and she declined, except on condition that you should procure another homestead, did you tell her your reasons for wishing to sell, and what you proposed to do with the proceeds of sale, if made?

A. Yes, sir; I told her that I would like to sell and pay off my debts and get into a business that I could make more money in than I was making; that I was hampered; that I had a number of improvements that I wanted to secure.

Q. 632. What improvements did you refer to by that?

A. The telephone for one, and the clock, and a faucet that I had—a measuring faucet.

Q. 633. Why did you transfer your homestead from Eberly's Mills to Mechanicsburg in 1876?

A. For the purpose of getting into business at Mechanicsburg. I had contemplated working for S. &. G. Hauck.

Q. 634. Have you ever owned any other real estate except the homestead at Eberly's Mills and the one which you purchased at Mechanicsburg, after selling the Eberly's Mills property?

A. No, sir.

Q. 635. What other property did you own from 1869 down to the middle of 1880 or at any time intervening, except the homestead and the household furniture therein and your tools?

A. No other.

Q. 636. In exhibiting your various telephones to other persons all along during the time from 1868, and after you had made improved instruments, what was your custom as regards selecting from your various instruments an instrument to show them, or to operate for them? Did you generally exhibit the original instruments, or improved forms, or both?

A. I would generally give an explanation with the improved forms—showing the principle. Then I would show the original to show the progress I had made in the improvements.

Q. 637. David M. Ditlow has testified (Defendants' printed record, page 598 [573]) that about the year 1872, he went to your shop and you showed him and talked to him through a machine with tin tubes at each end, and a wire wrapped with string. You have not mentioned such machine in your testimony, if he has described it correctly. What, if anything, do you remember about it?

A. I can't remember of ever having a machine of that description. I think he has reference to "Exhibit B."

Q. 638. Some of the witnesses for the defense have testified to seeing you use a paper funnel, or something of that kind in connection with your earlier telephone instruments. What is your recollection about that?

A. I did; yes, sir.

Q. 639. Describe how you applied it, and why?

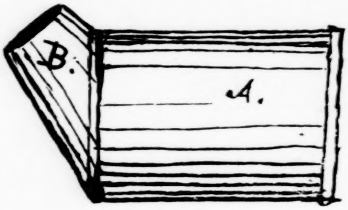
A. On the instrument "B" I fastened a pasteboard formed into a tube; the lower end of it bevelled off and fastened to the end of the tin tube farthest from the diaphragm—the end at which you place your ear.

Q. 640. Please make a sketch showing the application of said tube to the tin box instrument.

[*Witness makes a sketch and then says:*]

A. That is as near as I can remember.

[*Mr. Hill puts the sketch in evidence to be marked "exhibit D. Drawbaugh sketch, No.* 4."]



Q. 641. In the above sketch you have, at my request, marked one part with the letter A, and the other part with the letter B. What do those parts respectively represent?

A. A represents the case, or the body of the instrument, and B represents the paper funnel or tube.

Q. 642. Some of the witnesses have referred to seeing diaphragms on the instruments, which diaphragms they thought were made of tissue paper; what was the fact?

A. I don't think that I ever made any diaphragms out of tissue paper; I don't remember; I generally used animal membrane—hog's bladder; that looked something like oiled tissue paper; I think one of them says oiled tissue paper.

Q. 643. Daniel W. Smith testified, on page 74 [71] of Defendants' printed record, that he made an affidavit on one occasion when you and Mr. Jacobs were present, and Mr. Jacobs administered the affirmation; what is your recollection about that?

A. I think Mr. Smith is mistaken about that; Squire Lee administered the affirmation.

Q. 644. Henry C. Springer testified, on page 191 [183] of Defendants printed record, that about two months after April 1st, 1876, you showed him the two little magneto instruments, "D" and "E," and told him that you had improved the machine, and could talk both ways then; and that the first instruments, that you showed him during the two months prior to that time, would only talk one way; were the two little magneto instruments, "D" and "E," the first instruments that you made that would talk both ways, or not?

A. No, sir; I had other instruments; instrument "C" was one, and "I" was another, but "C" was not as well adapted as a receiver, as it was as a transmitter. I suppose I wanted to have him understand that those small magneto instruments could be handled more easily from the mouth to the ear.

Adjourned for dinner until 2.30, P. M.

January 11, 1882, 2.30, P. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Examination of Daniel Drawbaugh by Mr. Hill continued:

[*Mr. Hill offers in evidence, as "exhibit Drawbaugh judgments, full re-*

cord," a certified copy from the records and proceedings enrolled in the Court of Common Pleas, in and for the County of Cumberland, and State of Pennsylvania.]

Q. 645. Some of the drawings made by Mr. Knight, and which have heretofore been put in evidence in this cause, to wit: "Exhibit C drawing," "Exhibit reproduced I drawing No. 1," "Exhibit M drawing," "Exhibit reproduced L drawing," "Exhibit reproduced M drawing," contain certain notes, each marked "note," and signed by W. H. H. Knight; please examine said several notes and see if the statements contained therein are correct?

A. The note on "Exhibit C drawing" is correct.

The note on "Exhibit reproduced I drawing" is correct.

The note on "Exhibit M drawing" is correct.

The note on "Exhibit reproduced L drawing" is correct.

The note on "Exhibit reproduced M drawing" is also correct.

[*Mr. Hill offers in evidence a tracing of the front elevation on "Exhibit J drawing, sheet 1;" also a tracing of the rear elevation on "Exhibit reproduced P drawing sheet 2," also a tracing of the front elevation on "Exhibit reproduced P drawing, sheet 1;" the first mentioned tracing to be marked "Exhibit J circuits," the second tracing mentioned to be marked "Exhibit P circuits, No. 1;" and the third tracing mentioned to be marked "Exhibit P circuits, No. 2;" in which several tracings the route of the electric current is represented by lines of different colors.*]

Q. 646. Please examine these three tracings, which I have just put in evidence, and state whether you have carefully compared the circuit lines there shown, with the instruments intended to be represented; and if so, state whether the colored lines upon the tracings, accurately represent the route of the electric currents, under the different adjustments of the switches and battery connections?

A. Yes, sir; they do.

Q. 647. Were these tracings prepared under your direction?

A. I don't know that they were prepared under my direction; I examined them as they were prepared, and I traced the lines with a pencil, and they were afterwards traced with colors; I directed how they should be traced in colors.

Q. 648. When did you first have any information as to the alleged date of Alexander Graham Bell's invention of the telephone?

A. Not till about the year 1880,—about the time, or a little while before, this suit was started.

Q. 649. When did you first have any information about the alleged date of Elisha Gray's invention of the telephone?

A. That is more recent; that is, after I became acquainted with Bell's alleged invention; I can't positively say, but I know it was after that yet.

[*Mr. Hill offers in evidence an instrument to be marked "Exhibit reproduced B instrument;" also an instrument to be marked "Exhibit reproduced C instrument;" also an instrument to be marked "Exhibit reproduced F instrument;" also an instrument to be marked "Exhibit reproduced I instrument;" also an instrument to be marked "Exhibit reproduced L instrument;" also an instrument to be marked "Exhibit reproduced M instrument;" also an instrument to be marked "Exhibit reproduced P instrument."*]

Q. 650. Please state whether these instruments, which I have just put in evidence, have been made under your direction for the purpose of putting in evidence in this suit?

A. Yes, sir; they have.

Q. 651. Please state how they severally compare with the original machines of which they purport to be reproductions?

A. I have examined the reproduced drawings, and find them to compare correctly with the reproduced instruments.

Q. 652. You mean the reproduced drawings which have been put in evidence here and about which you have testified?

A. Yes, sir.

Q. 653. Do you mean to be understood that "Exhibit reproduced B instrument" is an accurate reproduction of the original instrument "Exhibit B," as it existed many years ago, as you have testified?

A. No, sir; as it was before—some time before, but not the original instrument; the original had a string which the reproduction does not have; the original instrument was represented in a drawing that I made here, while I was on the stand.

Q. 654. You testified that a year or two after you made the instrument "B" in its original form, with the diaphragm attached to the armature by a string, you changed it to the form represented in "Exhibit reproduced B drawing;" state whether "Exhibit B reproduced instrument" is or is not an accurate reproduction of the tin box receiver, as it existed at the time that change was completed?

A. Yes, sir; it is, with the exception that the magnet may not be exactly the same size, but the parts are the same; I mean the electromagnet.

Q. 655. Is there any difference that would make a difference of operation or result?

A. No, sir.

Q. 656. How does "Exhibit reproduced F instrument" compare with the old tumbler instrument, as the latter existed prior to 1871, when you used it in connection with instrument "C"?

A. It compares exactly, with the exception of a modification; I had it in two forms; that is, in one I had two metal posts, or a continued stirrup; and in another I had one, as represented partly in "Exhibit F drawing;" it compares in every other respect.

Q. 657. Am I to understand you that it is an accurate reproduction of one of the two original modifications or forms?

A. Yes, sir.

Q. 658. How does "Exhibit reproduced C instrument" compare with the original instrument "C," as the latter existed prior to July, 1873, when the Haucks purchased the faucet business?

A. It compares exactly, except that the permanent magnet is a little longer or larger, I think, than in the original; and the electro-magnets are a little shorter, I think.

Q. 659. State whether there is any difference that would produce difference of result or operation.

A. No, sir; I think not.

Q. 660. State whether or not "exhibit reproduced I instrument" is an accurate reproduction of one of the forms of original instrument "I," as the latter existed prior to the said Hauck's purchase.

A. Yes, sir.

Q. 661. Please state whether "exhibit reproduced L instrument" is an accurate reproduction of the original instrument marked "L."

A. Yes, sir; it is.

Q. 662. Please state whether "exhibit reproduced M instrument" is an accurate reproduction of the original instrument marked "M."

A. Yes, sir; it is.

Q. 663. Please state whether the "exhibit reproduced P instrument" is an accurate reproduction of the original "P" instrument.

A. It is in every respect, except the flexible tube. In the original, the flexible tube contained a spiral spring. In the reproduction, there is no spiral spring.

Q. 664. Why was the spiral spring omitted from the reproduction?

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A. Because I had no wire of the right number to make it from at the time the instrument was made.

Q. 665. You have testified that the electro-magnet of "reproduced B instrument" is, or may be, of somewhat different size from the electro-magnet of the original instrument. Was that difference accidental or intentional?

A. It wasn't intentional. My brother made the electro-magnet, and the original instrument was not there at the time. I gave him the size from memory. I just guessed at it. I couldn't get at the size exactly.

Q. 666. You have also testified that the permanent magnet and electro-magnet of "reproduced C instrument" differ a little in size, as you think, from the corresponding magnets of the original instrument. Was that difference accidental or intentional?

A. It was not intentional. My brother also made them. The original magnets were not about—didn't have them. They had been mislaid or lost, or perhaps, had been changed in some other form. I gave my brother directions of the size of them by memory.

Cross-examined by Mr. Smith:

Cross-Q. 667. I understand you that prior to the spring of 1867, when the Drawbaugh Manufacturing Company was organized, and moved into the shop which you now occupy, you had had a shop in the basement of the house where you lived for many years. What business had you carried on in that shop?

A. Manufacturing stave-jointing machines and stave-cutting machines.

Cross-Q. 668. For how many years was that business carried on in that shop?

A. Some six, eight, or, may be, it might have been ten years. I can't just exactly state.

Cross-Q. 669. Had you carried on that business during the two or three years immediately preceding the spring of 1867?

A. No; I think not.

Cross-Q. 670. When did you discontinue that business?

A. I could ascertain that and give the dates, but I couldn't just say—about 1865 or 1866.

Cross-Q. 671. Can you tell about what amount of business you did per year while carrying on that business?

A. I couldn't now, exactly. For a number of the latter years that

I carried on that business it didn't amount to three or four hundred dollars a year—for a number of years.

Cross-Q. 672. Did you do any other work in that shop while you were manufacturing stave-cutters and stave-jointers?

A. Yes, sir; some other work.

Cross-Q. 673. What other work did you do during that time?

A. I done some repairing work; that is, repairing agricultural implements, threshing-machines, some little repairs on horse powers, and different other jobs that I cannot now enumerate—done some little in model making for different parties.

Cross-Q. 674. What kind of model-making was it that you did?

A. Models for parties for experimental purposes.

Cross-Q. 675. Do you recall the names of the parties for whom you made models, and the character of the models?

A. I can't now recall any. I made some models of my own, of inventions I was experimenting on then.

Cross-Q. 676. What models of your own do your refer to which you made during that period, while you were carrying on that stave-cutter and jointer business?

A. Models on a machine for feeding nail plates, and models of measuring faucets.

Crsos-Q. 677. Were you working on these last mentioned machines, during the latter years of the time during which you carried on this stave-cutter and stave jointer business?

A. I can't remember the dates. That bothers me a little. Some of those models for the measuring faucet were made between 1864 and 1866, somewhere. I could not give no very accurate date when I made them. I made the models of the nail machine prior to that, to the best of my recollection. I don't want to be too positive. Dates I am not very accuate in.

Cross-Q. 678. These were machines of your own invention, were they not?

A. Yse sir.

Cross-Q. 679. Was your work on them confined to the building of models, or did you build, or attempt to build, working machines?

A. I built one nail cutting machine with the feeder attached, and I also put up a few faucets, to show the working of the faucet. I didn't have the tools to work in a fast way. I only had one small hand lathe

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and a hand drill. The hand lathe was not my own. That Mr. Eberly had bought for me—had bought it, and let me work on it.

Cross-Q. 680. Can you give me any idea how much time you spent on the nail machine and the faucet, while you kept your shop in the basement of the house you lived in?

A. It would be a little hard for me to give the time I spent on it. I worked on it at different times. There were intermissions that I didn't work on the nail machine. I could get at the time I spent on the faucet nearer.

Cross-Q. 681. Please give the time as near as you can, that you spent on the faucet while your shop was in the basement of your house?

A. In making the models, patterns, and some of the experiments with it, I might have consumed two or three months, to the best of my judgment about it.

Cross-Q. 682. Can you give me any idea how much you expended for materials, in your experiments on the faucet, and in building the ones that you set up for trial?

A. I didn't expend any. There was another party that found the material—took an interest in it, and I done the labor. In the faucet it was Lafayette Croll. He now lives in the city here.

Adjourned until January 12, 1882, at ten, A. M.

January 12, 1882, 10.30, A. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Cross-examination of Daniel Drawbuugh by Mr. Smith continued.

Cross-Q. 683. Do you remember how many faucets you built, that you set up for trial, before you moved your shop from the basement of your house?

A. I could hardly say how many. It might have been six, or it might have been a dozen or more. The most of them were experimental—or all of them.

Cross-Q. 684. Were any of them sold, or put into the hands of other parties away from your shop for trial or practical use?

A. There may a few of them have been sold; I don't remember. There were some put out in the hands of other parties for trial, but the number I couldn't say.

Cross-Q. 685. Do you remember the names of the people, or any of the people who had them for trial?

A. The first one, I guess, was put in the store there at my place for trial. I am not positive who kept the store at that time. I think it was Lafayette Croll. I could get at dates more accurately if I had an account book that is lost. I have tried to inform myself, but couldn't get at it. I think Beelman and Houston, grocers in this city, had one or two. There may have been some others that I can't now think of.

Cross-Q. 686. Do you remember the names of parties who bought them, and the prices they paid for them?

A. The price I remember; they were to pay five dollars.

Cross-Q. 687. Did Mr. Croll make an arrangement with you to provide the materials for experimenting on the faucet, before you had actually constructed any of them?

A. Yes, sir; with the exception of the first experimental, or trial one, which was made of wood. I don't remember that we had any contract for the material of that one.

Cross-Q. 688. Did you make that one before you made any contract with Mr. Croll?

A. Some time, in the winter of the year 1865, I guess, he had molasses that he couldn't draw on account of the cold weather; he asked me whether I couldn't get up an arrangement or machine that would draw that without so much trouble; I told him I would think; that perhaps there might be a machine made. The next day, I think it was, I constructed a crude apparatus. I took it to his store, and we tried it. He was very much pleased with it; he told me he would like to have an interest in the apparatus. We then made a contract, that he should have an undivided half interest, find all material, and pay all expenses for taking out a patent, experimenting, and all expenses connected with it, for that undivided interest.

Cross-Q. 689. Was that contract understood to be limited to the experimenting that might be necessary, and to the taking out of the patent, or was it to apply to the manufacture of the instruments for sale, after the patent was obtained?

A. It was for both, I think; for the experimenting and the manufacture.

Cross-Q 690. How long did Mr. Croll retain his interest under that contract?

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A. I could hardly say; it may have been three or six months, or perhaps a year; it may have been more.

Cross-Q. 691. Did he sell his interest to any one? If so, to whom was it?

A. He did; he sold his interest to A. H. Gardner; or that was the understanding; that is, they told me so; but before that sale, I had sold my interest to A. H. Gardner—before Croll had sold his.

Cross-Q. 692. Where did Mr. Gardner live, what was his business, and where does he live now?

A. He lived at the same village at which I live now, Eberly's Mills; he was superintending, I think, an iron ore bank for Dr. Heck; he now lives at Steelton, Dauphin County, Penna.

Cross-Q. 693. How long did he continue to live at Eberly's Mills?

A. I could hardly say. At the time he made this contract I don't think he lived at Eberly's Mills; I think he boarded with a man by the name of Best, who lived about a mile from Eberly's Mills. He may have lived at Eberly's Mills six or eight years; it may have been more, or it may have been less.

Cross-Q. 694 While he lived at Eberly's Mills, how near was his home to yours?

A. It may have been a hundred yards—more or less—I can't say how much.

Cross-Q. 695. Will you state, as nearly as you can, at what time he made a trade with you for your half interest in the faucet, and in what way that trade came to be made, or what circumstances led to the trade?

A. The contract was made within a week or three after the first experimental machine was made, as near as I can remember. I can't answer as to what circumstances led to the trade; I don't know what circumstances.

Cross-Q. 696. If I have understood the testimony correctly, heretofore, I think Mr. Gardner obtained his deed some time in February, 1867, and gave you his note for $1000; had he paid you or furnished you any money before that time, on account of the faucet contract?

A. He gave me a note for a thousand dollars. The date of the deed I don't remember, and any promise of money before that I don't remember; if he had, I have forgotten. He had furnished me money before that for material and labor; that is, at the time Mr. Croll and he had the control of it.

Cross-Q. 697. Then, if I understand you, you got pay for all your labor on that invention, after Mr. Gardner made his contract with you; is that so?

A. They paid me for my labor, while they had it in their control.

Cross-Q. 698. How much did they pay you for your labor, or labor and material both?

A. I think they were to pay me a dollar or a dollar and a half a day; I don't remember the amount. They found the material.

Cross-Q. 699. I understand that when the Drawbaugh Company was organized, or while it was in existence, its business embraced pumps, as well as faucets. Were those pumps invented by you; if so, when did you make that invention?

A. That was the same invention as the faucet—the same principle; there was a modification in the construction; that was the only difference.

Cross-Q. 700. Was there more than one patent on the faucet and pump?

A. No, sir; only one There were two patents on faucets; that is, they were very dissimilar—the two faucets.

Cross-Q. 701. Were there two patents on the faucet that you sold to Croll and Gardner?

A. Yes, sir.

Cross-Q. 702. Can you state when these patents were applied for respectively, and when they were granted?

[*Mr. Hill says, that if the object of the question is intended to fix the dates of the applications and the patents, the question is objected to, as calling for secondary evidence.*

By consent of counsel, the dates are taken from complainants' moving papers on file, as follows: The dates for both patents are: applications, September 14, 1866; *patents, November 20th*, 1866.]

Cross-Q. 703. Were both these patents covered by your contracts with Croll and Gardner, and were they subsequently purchased by the Drawbaugh Manufacturing Company?

A. If I remember right, they were.

Cross-Q. 704. If I have understood the testimony correctly, you obtained from the parties who formed the Drawbaugh Manufacturing Company five thousand dollars, in addition to what you had obtained under the Croll and Gardner contracts; how came you to get this additional sum, after having sold the inventions to Croll and Gardner?

A. This patent—the original patent was divided into two parts; Croll and Gardner were to have the interest in the invention so far as it related to measuring molasses or other viscid liquids, and the Pump Company were to have the use of it for pumping aqueous liquids. I could produce written contracts showing that, if it is necessary.

Cross-Q. 705. Croll and Gardner, however, furnished the materials and paid for the labor covering both parts of the invention, did they not?

[*Objected to by Mr Hill as immaterial and irrelevant.*]

A. No, sir; I think not; just as far as related to faucets.

Cross-Q. 706. Who paid for the labor and material so far as related to pumps. I mean, labor and material expended experimentally, in making the inventions, before your sale to the parties who formed the Drawbaugh Manufacturing Company?

[*Same objection by Mr. Hill.*]

A. There wasn't much labor and material expended. I used a faucet as a pump; I enlarged the nozzle to apply a pipe. This instrument I can produce; it is marked a faucet.

Cross-Q. 707. In what way, and when, did your negotiations commence with the several parties who formed the "Drawbaugh Manufacturing Company"?

A. In the way, that I showed them, or that they had seen the faucet used as a pump; I can't give the exact time, but I think there was not much time between the close of my work for the faucet company, or Croll and Gardner, and my negotiations with the Pump Company.

Cross-Q. 708. When did you commence your experiments upon the nail feeder, to which you have referred?

[*Objected to as already fully inquired of, and testified to, yesterday.*]

A. I couldn't positively say how long. I think it was before I experimented with the faucet; but there were several patents taken out on that; at least, the dates I don't remember, but I could furnish the dates if required.

Cross-Q. 709. Did you, at the time when you commenced those experiments, or at any time during their progress, have any contract with any party, relative to these inventions—on the nail feeder?

A. Mr. Christian Eberly, at the time I commenced, became a partner; he furnished the money for the experiments and for procuring the patent, for which I gave him an undivided half interest. I mean the nail feeding device.

Cross-Q. 710. I wish you would reflect a few moments, and see if you cannot fix the time more nearly, when you made this contract with Mr. Eberly?

A. It was some time before the application was made for a patent. but the length of time before, I can't state.

Cross-Q. 711. You were to give your labor, I suppose, in making this invention, and Mr. Eberly was to furnish material?

A. Yes, sir; and at the same time he was to pay me a salary by the day. I think a dollar, or a dollar and a half a day.

Cross-Q. 712. Do you remember how much he paid you under that arrangement?

A. I don't remember of him paying me any money. I always took it out in mill stuff, flour, feed, &c., and meat and provisions for my family. At the end of each year, I always owed him money, I know that.

Cross-Q. 713. Do you remember about how much labor you did for which you were entitled to a dollar, or a dollar and a half a day from Mr. Eberly, under that arrangement?

A. No, sir; I don't know how much. I was not working on the nail-machine all the time. There was times that I did some other work.

Cross-Q. 714. Have you any means of ascertaining how much work you did for Mr. Eberly, and for which you were entitled to the compensation you have mentioned?

A. I may, perhaps, by referring, if they are not lost, to some small time or memorandum books that I had.

Cross-Q. 715. Have you been in the habit of keeping time books or memorandum books which show the time and manner in which you have been employed?

A. Yes; to some extent. I was not as particular as some in keeping books. I know I was a little negligent in keeping my accounts. The account book that I had for that time is now lost. The account book I kept at the house; and I often entered my work in a memorandum book that I carried in my pocket.

Cross-Q. 716. Have you ever rendered an account to Mr. Eberly of the time or labor expended on the nail feeding invention?

A. Yes, sir; we looked over some accounts. I had lost my book; that is, I had a number of memorandum books. We looked over them.

They took up a space, maybe, of a dozen or more years, and I remember of owing him a pretty big amount, and he said "we will square accounts." I owed him several hundred dollars, to the best of my recollection.

Cross-Q. 717. When was it that you had this settlement of which you have spoken?

A. I couldn't exactly state, it has been a good while ago. It might have been 1865, 1866, 1867, or some time about there. I could, perhaps, give the time by referring to some circumstances.

Cross-Q. 718. Will you ascertain, if you can, where this was, and also what the amount of Mr. Eberly's charge against you was, and also the period of time which his account embraced?

A. Yes, sir; I will try.

Cross-Q. 719. And do you remember down to how late a period your work on the nail feeder continued, under the arrangement with Mr. Eberly?

A. I couldn't give that accurately, either. It may have been down to 1869, 1870, or 1871. I might fix that by a circumstance—by asking Mr. McCormick. I had put up a machine at McCormick's nail factory at Fairview, on trial. That was about the last work done. I don't remember the time exactly, but I think it was between those years.

Cross-Q. 720. Will you please ascertain, if you can, when this last work was done?

A. Yes, sir; I will try.

Cross-Q. 721. Perhaps, in the meantime, you can state from recollection, whether you did any work on nail machines after the Drawbaugh Manufacturing Company went into operation?

A. I did; the former two or three years, perhaps.

Cross-Q. 722. Do you remember whether any nail machines were set up in the shop of the Drawbaugh Manufacturing Company?

A. There was no machine built. There was one set up in the basement story—the Drawbaugh Pump Company, it was then.

Cross-Q. 723. Where was that machine built, and at what time was it set up in the basement of the Drawbaugh Pump Company? How long did it remain there, and what was done with it while it was there?

A. It was built in the basement story of the house where I was living before I moved my shop to the lower shop. I couldn't accurately give the date when it was set up, as before stated. It may have been between 1868 and 1869. It remained there until within three, four, or five years ago. It was used as an experimental machine. I cut some few nails to show its workings.

Recess for dinner until 2, P. M.

January 12, 1882, 2, P. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Cross-examination of Daniel Drawbaugh by Mr. Smith continued.

Cross-Q. 724. How many nail machines with your feeders, did you build in all?

A. One nail machine, and three or four feeders, each one made a little differently.

Cross-Q. 725. After you had the settlement, which you have referred to, with Mr. Eberly, did you do any further work on the nail machine under your agreement; and, if so, will you state the amount, or ascertain it, if you are unable to state it at the present moment?

A. I did not after the last settlement, to the best of my recollection.

Cross-Q. 726. Did you, during the time when you were working on the nail machine, do any work for Mr. Eberly, which did not come within the contract. If so, what amount?

A. I did; but the amount I could hardly state; some years more and some years less amounts.

Cross-Q. 727. Can you ascertain the amounts?

A. I may, perhaps.

Cross-Q. 728. Will you ascertain as far as possible, what was the amount of your account against Mr. Eberly under the nail feeding arrangement, and also your account against him, during the same period, for other work which you did for him; and as I infer from the answers you have just given, that you have had more than one settlement with Mr. Eberly, will you ascertain the amount of his charges against you, in all the settlements you have made, and in all the accounts he has rendered you, since you made the arrangement with respect to the nail feeder?

A. I will try.

Cross-Q. 729. Mr. Eberly was known to be a man possessed of considerable property, was he not, during the time since you made the arrangement with him?

A. He was, in the former part of our arrangements. He was considered, then, pretty wealthy.

Cross-Q. 730. What amount did you receive for your labor on the faucets, before the patents were sold to the Drawbaugh Company?

A. I could hardly state. I don't remember. I could perhaps by looking at some memorandum, or by calling on Mr. A. H. Gardner or Mr. Croll.

Cross-Q. 731. Will you please do so, and let me know the amount?

A. I will, but I shall have to ask for time. I should have a day to see these different parties.

Cross-Q. 732. What other parties did you do work for during the two years preceding the formation of the Drawbaugh Company?

A. I could hardly mention. I did work for the general neighborhood there. I could mention some. I did work for Samuel Hertzler, Daniel Hart, George B. Heck, William R Gorgas, John Free, Jackson Free, and by reflection, I could mention a good many others, but I couldn't now.

Cross-.Q 733. Could you give me some estimate of the amount of work you did for other parties, outside of what you did on the faucet and the nail feeding machine during those two years?

A. No. I could hardly give the amount. I could if I had the account book that is lost. I may be able to give some from memoranda that I have. I will try.

[*Counsel requests him to do so.*]

Cross-Q. 734. What period of time is covered by that account book which you say is lost, and how long has it been lost?

A. The period of time is about from 1861 to 1876. I think it was in 1876 it was lost, about the time I moved to Mechanicsburg. I won't be positive that it was 1861. It was about that time.

Cross-Q. 735. When the Pump Company, in the spring of 1867, moved into the shop which you now occupy, you moved your machinery and tools into the shop, and used them there afterwards. Did you not?

A. Yes, sir.

Cross-Q. 736. Can you state generally what those machines and tools were?

A. There were two bench-vises; tools of a hand-lathe; general tools for a drill press or drilling machine, and general wood-working tools composed of saws, chisels, drawing knives, hatchets, several hammers; that is, tools generally used for wood-working, pattern-making, &c.

Cross Q. 737. Had pattern-making been a part of your business, prior to that time?

A. Yes, sir.

Cross-Q. 738. For whom had you been accustomed to make patterns?

A. I made some patterns for Mr. Eberly, for some repairs in his flouring mill. I made some patterns for Lee & Eberly. I made some patterns for Lee & Eberly again—Frank Lee and Eberly were running a brick machine here in the city. I also made some patterns for Abraham Miller, who was running a foundry at Newville. I can't remember all the different parties I made patterns for.

Cross-Q. 739. When the Pump Company commenced business, I suppose it procured additional machinery and tools for carrying on business; if so, will you state, as near as you can, what the equipment of the shop was, and what amount of money was expended for its equipment?

A. I could hardly do that; you could get it more accurately from the Company's books; the equipment is stated in them, I think.

Cross-Q. 740. Can you give the dimensions of that building?

A. I would suppose it to be about forty feet in length; thirty or thirty-five feet in width; two stories and a basement or cellar, and garret or loft.

Cross-Q. 741. Were the basement and the lower floor divided into two or more rooms, or did they each constitute one room?

A. The basement was in one room; the first floor was in two rooms at an early period; I can't state the time; that is, the north-west corner had a small room partitioned off before the Faucet Company, and this remained a short time after the Pump Company occupied the building.

Cross-Q. 742. Will you describe the second story, and state what room or partitions there were in it, at the time when the Pump Company moved in?

A. I think that the second story had some partitions, but I don't remember how they were arranged; I won't be too positive. It had been occupied as a match factory prior to the Pump Company. I have been in pretty often, but I don't remember how it was arranged.

Cross-Q. 743. Did the Pump Company make any change in that

LEPHONE COMPANY,-2

floor; if so, when, and what was the arrangement of the floor, after the change?

A. Yes, sir; they made some change; they moved the small room —brought it up, or the partition from down stairs—and made a small room in the north-east corner of the second floor. The time I do not remember, but it may have been the first six months that the Pump Company were there; I won't be too positive as to the time. With the exception of that small room, the second floor was one room.

Cross-Q. 744. If any change was afterwards made in that floor, state when the change was made, and what it was?

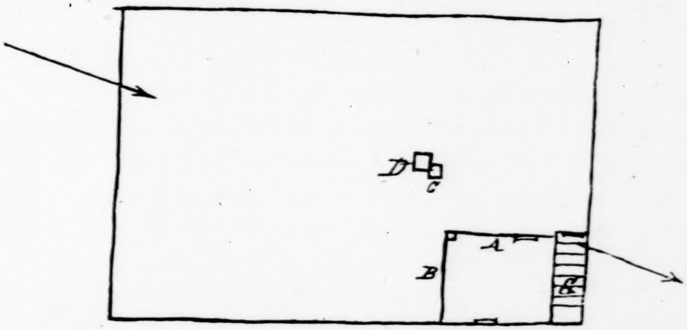
A. There was a change made; it may have been shortly after the first change was made. Another small room was made with partitions, and was used as a wood-working department. I can't give any date, but it occurs to me it was shortly after the first change was made.

Cross-Q. 745. Was this second change made by running the partition across from one side to the other, or in what way was the change made?

A. It run across about as far into the room as the office did, and, if I remember rightly, from a post that was near a chimney, run out to the door. The one partition ran from the post to the west side of the the shop, then from the post to the north end of the shop.

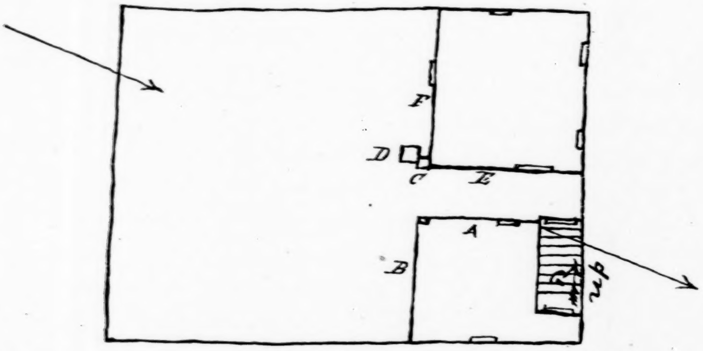
Cross Q. 746. Will you make some diagrams showing the arrangements of the rooms on this floor before this last change was made, and also after the change was made?

[*Witness produces diagram marked "Shop diagram, No. 1."*]



A. That represents the second story after the partitions were moved up from the floor below to make the small room in the north-east corner.

[*Witness produces another diagram marked* "*Shop diagram, No.* 2."]



That represents, to the best of my recollection, the room after the change referred to in my last answer. A and B, on each of the diagrams, represent the partitions of the small room adjoining the staircase G, in the north-east corner on the second floor; C represents a post; D represents a chimney; G represents the stair-case which comes up from the first to the second floor; F and D on diagram No. 2, represent the partitions of the additional room built for a wood-working room. The doors and windows of these rooms are indicated by double lines on the walls of the rooms.

Cross-Q. 747. Is the little room by the stair-case the one you referred to in a previous answer as the office?

A. Yes, sir; that is the one I referred to; it was an office or private room.

Cross-Q. 748. Was a change again made on that floor, after the one shown by diagram No. 2; if so, will you make a diagram showing the room after said change was made?

A. There were a number of changes and so it would be hard for me to describe them; I think the next change was one made by myself, by moving the partition F in towards the north, making the wood-working room somewhat smaller; but the time I couldn't give accurately.

Cross-Q. 749. Was this change, last referred to, made while the Pump Company carried on business there?

A. It was during the time that they occupied the shop, but it was while they had suspended work; I was there alone. They gave me the privilege of staying there and doing work for myself.

Cross-Q. 750. Was it before the Haucks went there?

A. Yes, sir.

Cross-Q. 751. Were any other changes made in the rooms on that floor, before the Haucks went there; if so, what was the next change?

A. I couldn't say positively that there was: I can't remember; it occurs to me that there were changes, but I can't remember what they were. There was a time, and it occurs to me that it was before the Haucks came there—I think the private room by the stair-case was made smaller by moving the partition B.

Cross-Q. 752. Were any changes made at the time the Haucks moved there, or soon after, on this floor?

A. I don't remember that there were changes made at the time they came there, or soon after. There were changes made at the time the Axle Company took charge of the shop, on that floor.

Cross-Q. 753. What were those changes?

A. There was a stairs placed on the outside of the building, brought up from ground to the second floor, at the north end of the building, and a door-way cut through the outer wall into the second floor, entering a gangway between the two rooms; partition F was moved further south.

Cross-Q. 754. How long did that place remain as it was after these last changes; and what, if anything, was next done to it?

A. It remained so until the Clock Company had taken charge of the shop, in the spring or summer of 1878. There was a change in the partition F again; it was brought in towards the north again, I think; then a partition ran from the chimney or post to the south end of the shop. This partition was a prolongation of partition E. I am positive about the long partition, but not about partition F.

Cross-Q. 755. Has any change been made since the long partition was put up; if so, what and where?

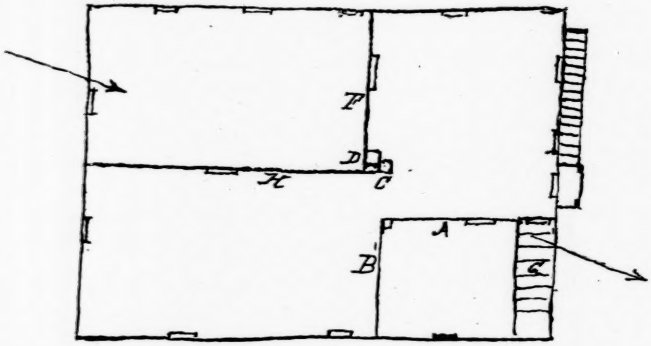
A. There was a change; this small private room, in the north-east corner by the stair-case, was removed. The time I can't exactly give; it was the time that Mr. Chellis first took charge of the shop. I forgot to say that at the time changes were made while the Clock Company were in charge of the shop, partition E was removed, so that I was mistaken in saying that the long partition was a prolongation of partition E.

Cross-Q. 756. Have any further changes been made, since Mr. Chellis took charge there?

A. When this room by the stair-case was moved, partition F, was extended all the way across the shop to the east side.

Cross-Q. 757. Will you make a diagram of the second story, as it was after the changes made while the Clock Company were there?

[*Witness produces diagram marked "Shop diagram No.* 3."]



Adjourned until January 13, 1882, at ten olock, A. M.

January 13, 1882, ten *o'clock*, A. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Cross-examination of Daniel Drawbaugh by Mr. Smith, continued:

Cross-Q. 758. What machines, or machinery was there in the basement while the Pump or Drawbaugh Manufacturing Company occupied the building, and for what was it used?

A. There was a nail machine, as I stated before, put there for experimental purposes; and a grind stone, for grinding stave knives—that is what it was used for.

Cross-Q. 759. Wasn't there a cider mill there; if so, whose was it and how much was it used?

A. Yes, sir; there was a cider mill there; it was mine. It was used one season, I think; it might have been two, but there was only one season that I did much, or any, business with it. It was afterwards sold to Mr. Elias Hake. I couldn't state what year it was, that I did the business with it, unless I would inform myself. I sold it in the summer or fall of 1875.

Cross-Q. 760. What machinery was there on the first floor, and what work was done there by the Pump or Drawbaugh Manufacturing Company?

A. I will try and give that to you to the best of my recollection. There were five engine lathes, I think; two small, or hand lathes; a machine for drilling faucets, as it was called; a drill-press; a grind stone; there may have been some other small machinery that I can't think of now.

Cross-Q. 761. This shop had a water wheel for driving the machinery; did it not?

A. Yes, sir.

Cross-Q. 762. Will you state what machinery there was on the second floor, and for what the several rooms were used, while the Drawbaugh Manufacturing Company occupied the building?

A. I will state as near as I can remember. There was a wood-turning lathe; that was in the wood working room. There was a machine for making strainers for faucets; that was in a room in the southerly part of the shop, not in either of the small rooms. There was a small grindstone also, I think, in the same large open part of that story, where the strainer machine was. There was a small machine for cutting out the bottoms of strainers; that is all that I can remember of.

Cross-Q. 763. What was the attic used for?

A. For storing away some lumber, patterns, and general sundries that collected in the business.

Cross-Q. 764. Did you make an affidavit in the summer or fall of 1880, with reference to your inventions in telephones, to be used on the motion for the preliminary injunction?

A. I made an affidavit, but I don't remember the time of the year; it was in 1880.

Cross-Q. 765. Did you make more than one affidavit that year, in relation to these matters?

A. I don't know; if I did, I have forgotten it. To the best of my recollection, I did not.

Cross-Q. 766. You had very full consultations, that summer, with the defendants, or their counsel, with repect to what you had done; had you not?

A. I don't know whether you would call it full or not; we consulted together.

Cross-Q. 767. Did you give them a full account of all you had done with reference to telephones—a complete history?

A. I did, I suppose, as far as I could remember.

Cross-Q. 768. You went around with some of the counsel, during that summer or fall and the following winter, to procure affidavits from other parties; did you not?

A. Yes, sir; I did.

Cross-Q. 769. How much time did you spend in travelling about with counsel on that business?

A. I don't know; I couldn't give that accurately; there were some weeks that we were out nearly every day, and there were times when we wouldn't be out for a number of days, perhaps a week, to the best of my recollection.

Cross-Q. 770. As that was not a great while ago, I wish you would give me the best judgment you can, from your recollection, as to the amount of time you spent in that way?

A. I didn't keep any memorandum; I will have to give it to the best of my recollection; all the time summed up may have been three months, or it may have been six months.

Cross-Q. 771. How many affidavits did you obtain?

A. That I couldn't say—how many; we did not get affidavits from all the parties we called on.

Cross-Q. 772. Give me the best judgment you can, as to the number of affidavits you obtained?

A. There may have been fifteen, or there may have been double that number.

Cross-Q. 773. Did you know anything about the preparation of the Defendants' answer, which was filed in the case in January, 1881?

A. I did not—no; if I did, I did not understand its meaning; I didn't know what it was for; I don't recollect of knowing anything about it.

Cross-Q. 774. You have no recollection of being consulted about its preparation, have you, or of seeing it before it was filed?

A. I do not.

Cross-Q. 775. Will you look at a printed copy of the answer, which I now hand you, and especially at the tenth, eleventh, twelfth, thirteenth, fourteenth, fifteenth, and sixteenth sections, and after reading these sections carefully, tell me whether the statements therein contained, so far as they relate to yourself and your history, are in accordance with the information which you had given the Defendants or their counsel, and were justified by what you had told them?

[*After reading, as requested, witness answers.*]

A. Yes, sir; to the best of my recollection, that is in accordance with the statements, or history of the invention, that I had made.

Cross-Q. 776. I call your attention to a statement in the eleventh section, in these words: "That said Drawbaugh, for more than ten years prior to the year 1880, was miserably poor, in debt, with a large and helpless family dependent upon his daily labor for support, and was from such cause alone, utterly unable to patent his said invention, or caveat it, or manufacture and introduce it upon the market." You understand this to be a statement, do you not, that, before 1870, the cause, and the only cause, why you did not patent or caveat your invention, was your extreme poverty?

[*Objected to by Mr. Hill, as putting an incorrect construction upon said statement quoted from the answer.*]

A. I can't say it was extreme poverty, but I felt myself unable, because I made applications to other parties to take an interest. At that early day I knew that it was necessary to experiment, for the purpose of making the machines as perfect as possible, and I know that I had no ready cash, or money, to secure patents; for that reason I asked others to take an interest in it.

Cross-Q. 777. Do you mean to have it understood, from your last answer, that there was any other reason, for some period prior to 1870, except your poverty, whether greater or less, which prevented you from patenting your invention or filing a caveat for it?

A. If I understand that right, there was no other reason that I can think of now.

Cross-Q. 778. For how long a period before 1870 had that been your only reason for not patenting the invention or filing a caveat?

A. I can hardly say how long. My first instruments—I guess one reason with my first instruments was, that they were not perfect enough; but what period, I can't state.

Cross-Q. 779. Which were the instruments which were not perfect enough, and when did you first make instruments perfect enough, so that your only reason for not patenting them or filing a caveat was your poverty?

A. As near as I can remember now, the cup instrument wasn't in a form perfect enough, I thought. The date of time when I thought the machine perfect enough, I couldn't give. I couldn't give the exact date when I thought I did have them perfect enough. The tumbler instrument,—that is, the principle of the tumbler instrument, was perfect enough to make application for a patent, as near as I remember now. Instrument "B" I thought perfect enough.

Cross-Q. 780. Now, will you state for how long a period before 1870 the tumbler instrument and instrument "B" were in a shape which you thought perfect enough to patent?

A. I could hardly state that. I don't remember how long.

Cross-Q. 781. How near the time when the Pump Company moved into the shop, which you now occupy, was it when these instruments were in a condition to patent, as you thought?

A. It would be hard for me to state that. It may have been 1868 or 1869. I won't be positive about the dates, as I don't remember dates.

Crose-Q. 782. The 175th interrogatory refers, if I understand it, to instrument "C," and to the time when Mr. Sadler's wagon was painted, and is in these words: "To the best of your recollection, how long had it been made at that time?" and you answer, "I couldn't be positive as to the length of time. It may have been three, six, or nine months before, or perhaps a year. I don't remember." Referring to Mr. George W. Drawbaugh's testimony, (pages 623 and 624, [597 and 598,]) as to the time when he did the work for Mr. Sadler on the wagon, I understand him to say that he began it immediately after he purchased the lumber from Mr. John F. Lee; and referring to Mr. Lee's deposition, (page 633, [606,]) I find that his charges for lumber were January 11, 1870, March 22, 1870, and May 2, 1870. From these statements, in regard to the purchase of lumber, and the painting of the wagon, and from your statement with regard to the time before the painting of the wagon, at which the machine was made, I should infer that instrument "C" was made as early, at least, as 1869, probably by the middle of 1869, if not earlier. Do you think that would be a fair conclusion as to the time when instrument "C" was made?

[*Objected to by Mr. Hill, as memory, and not fair conclusions, is evidence.*]

A. I don't know. I don't remember the dates, you know. I am inferior in memory of dates. I paid no attention. It may have been. I can't say. I don't know whether it would be a fair conclusion or not.

Cross-Q. 783. Do you think that instrument "C" was made during the year 1869?

A. I couldn't positively say. It might have been.

Cross-Q. 784. Are you willing to say that it was not made as early as the first of 1869?

A. I am guided by the making of that wagon, and the trying of a certain experiment, and I know it was made before that. I couldn't state whether it was three months, six months, or whatever. I made that statement to the best of my recollection. If it had not been for the painting of that wagon, I would not have known whether it was made in 1871 or 1872. I was guided by the painting of that wagon.

Cross-Q. 785. Will you please answer my last question?

[*Objected to by Mr. Hill, as already fully answered, the witness having just testified to the entire exhaustion of his memory on the subject.*]

A. It may have been made as early as the first of 1869. I can't say.

Cross-Q. 786. The 177th interrogatory, referring to exhibits "B" and "F," is in these words: "To the best of your recollection, how long had you used them before you made instrument "C?" and you answer, "I couldn't positively say how long. It may have been several years—two or three years. It might, perhaps, have been more." Are you willing to say that you had not used "B" and "F" as far back as the time when the Pump Company moved into the shop where you now are, which would be only three years from the spring of 1870, when Sadler's wagon was painted, I suppose?

A. To go by my own recollection, I could'nt say that it was. George Drawbaugh says that the wagon was painted in 1870, but I hadn't remembered that date, but I know the instrument was used after the Company occupied the shop, but any particular date I can't give.

Cross-Q. 787. My question was, whether you were willing to say that those instruments, "B" and "F," were not used as early as the time when the Pump Company moved into the shop. Are you, or are you not, willing to say that they were not used as far back as that time?

A. I am willing, I think, to make fair statements. I don't remember when they were used. They may have been as early as that.

Recess for dinner until 2, P. M.

January 13, 1882, 2, P. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Cross-examination of Daniel Drawbaugh by Mr. Smith continued.

Cross-Q. 788. In the 622 interrogatory you were asked, "Why did you never draw specifications to be filed in the Patent Office, on your own inventions? ' And you answered, "I didn't think I was competent for drawing good specifications. That is as near as I can state it."

In that connection I wish to call your attention to a statement which your brother, Henry F. Drawbaugh, made, in a deposition which he gave in your behalf, in an interference with David A. Hauck and yourself. I read from page 30 of the testimony on your behalf. The answer to interrogatory ten: "He said," ("He" referring to yourself,) "Harry, it don't suit me, with my big family, to have my parents with me. You had father and mother with you until mother died, and cared for them at your own expense, and you keep father as long as he lives, as it suits you better than me, and we will take out this patent-right on this faucet and you furnish the money. I will make out the specifications, drawings, and models, and give you an interest in it, as an equivalent for taking care of our parents."

When you made this statement to your brother about making out the specifications, drawings, and models, did you mean to have him understand that you thought you were not competent to make specifications?

A. I don't know what I wanted him to understand at that time, but I always considered myself not competent to make good specifications and drawings. I was in the habit in a number of inventions of my own, to make drawings and preliminary specifications, to be corrected by the agent who would take out my patent.

Cross-Q. 789. In the same interference, when you were testifying, your counsel, Mr. Jacobs, who is also one of the counsel for the Defendants in this case, asked you (on page 37, question 95) to point out the difference between two things to which he referred, and the counsel for the opposite party objected that you were not "an expert in the examination of mechanical devices or appliances, nor mechanical drawings, and is, therefore, incompetent to testify to the facts solicited by the question;" whereupon Mr. Jacobs proceeded, as I understand, to show by your own testimony, that you were competent, and he put this interrogatory: "Mr. Drawbaugh, what was the first machine that you ever made?"

Do you remember what answer you made to that?

A. I don't remember exactly what answer I made to that. The reason of this is—I don't know whether the question had reference to some small devices I made when a small boy or not.

Cross-Q. 790. I will read your answer, and you may then state whether it was a correct one or not?

"Answer. I made part of a clock when I was about ten or twelve years old, and the next that I can remember of any consequence, was a small steam engine when I was between fifteen and seventeen years old. About that time I made an automatic machine for sawing wagon felloes. That was my own invention."

A. Yes, sir.

Cross-Q. 791. Mr. Jacobs then asked you, "Have you made many or few machines since that time?" And you answered, "I have made many." He then asked, "How many have you invented?" Do you remember what your answer was to that?

A. I don't remember how it was then, but I could state. It may not be just in rotation, as it would be there. I don't know that I could think of all the machines that I did invent. I will mention some. A stave-jointing machine; a stave, head, and shingle-cutting machine; a machine for dressing and rounding off barrel heading; machines for dressing and levelling mill-burrs; a machine or invention for balancing and running mill stones, termed improved mill-burr irons or ryne and driver; several improvements on measuring faucets; several improvements on a nail plate feeding device; and a great number of others that I couldn't just mention; there were a great many improvements and inventions that I didn't have patents for, and can't now remember. In that answer I may not have had as many, or I may have mentioned more. I may have mentioned in that statement, an improved machine for making carpet-tacks; and I might have mentioned a device for sewing carpet-rags; and I don't know whether I mentioned anywhere a number of improvements about the shop, in the way of machines for making different parts of the faucet. I do not know whether I mentioned that in there. There was quite a number of inventions in that.

Cross-Q. 792. The answer which you did give to Mr. Jacobs, was this: "Answer. I couldn't state how many; I might say fifty." That was a correct answer, I suppose?

A. Yes, sir; I will say that again."

Cross-Q. 793. Mr. Jacobs then asked you, "How many have you had patented?" And you answered, "Over a dozen." That was correct, I suppose?

A. Yes, sir.

Cross-Q. 794. He then asked you this question; "Have you applied for and procured in person patents for any of them, or have you not?" And do you remember what answer you gave to that question?

A. I don't know exactly what answer I made; I may have said that I made drawings and drew specifications.

Cross-Q. 795. The answer you did give was this: "Answer. Yes, sir; I mean I made my own specifications, models, and drawings, and drew my claims." That was correct, I suppose?

A. Yes, sir; that was correct; but they were afterwards revised, re-written.

Cross-Q. 796. Did you make any explanation at that time, that they were afterwards to be revised, and that they were not good specifications, drawings, and claims when they left your hands?

[*Objected to by Mr. Hill, as immaterial, unless it be shown that such explanations were called for by the counsel examining or cross-examining the witness, or that the attention of the witness was called to such matter.*

Counsel for Complainant suggests that the counsel who proposed the question could not at that time have been expected to call for any explanations tending to show that the witness was not qualified as an expert, and that it was the duty of the witness to state correctly the character of the work he had been accustomed to do.

Defendants' counsel insists upon his objection, that it should be shown that in the taking of the alleged deposition, the witness' mind was called to the matter now inquired of; and counsel, while declining to argue here the question as to the duty of the witness, fails to see why the answer was not a correct answer to the question as propounded.]

A. No, sir; I didn't think it necessary.

Cross-Q. 797. Mr. Jacobs then asked you, "Have you, or have you not, done the same for other inventors?" And you answered, "Yes, sir; I have." That was correct, I suppose?

A. Yes, sir; it was; I stated that here before, in my direct testimony.

Cross-Q. 798. A little further on, Mr. Jacobs asked you this question, "Have you, or have you not, read and studied much upon the subject of mechanics, and upon kindred subjects?" And your answer was, "I read a good deal; more particularly upon mechanical subjects." That was correct, I suppose?

A. Yes, sir.

Cross-Q. 799. In cross-examination, the opposing counsel asked you this question, on page 72, "Cross-Question 180. You stated that you have made your own specifications, drawings, and models, and also have done so for others; have you not uniformly had an attorney of record, in all your cases, in addition to yourself, who has supervised and corrected your specifications and claims?" And your answer was as follows:

"Ans. All my cases through the office were gotten by attorneys; but some of them were dictated and drawn up by me; though I have taken out a number of patents for other parties, I prepared their papers and drawings, but they made their own applications. It was then not necessary to have a power of attorney from the parties; there was no attorney of record in these cases." That answer was correct, I suppose?

A. Yes, sir; that answer was correct; but I might state, that in some of those cases, there were other drawings made, and changes in the specifications. So the party told me, that I drew these specifications for. I might not have thought it necessary, at that time, to make that statement.

Cross-Q. 800. What were your duties when you were first employed by the Pump Company, or "Drawbaugh Manufacturing Company?"

A. I don't know that I had any particular style; I was there to see after the mechanical part of the shop, and worked as one of the hands; and I was paid by the day.

Cross-Q. 801. At what rate per day were you to be paid, according to the agreement as originally made?

A. I think it was two dollars a day, if I remember right.

Cross-Q. 802. Did you work both upon the wood work and the iron work of the Company?

A. Yes, sir; I worked both at the iron work and the wood work—whatever was most necessary to be done.

Cross-Q. 803. Did you prepare any of the plans or working drawings of any machinery that the Company was constructing for its own use or for other people?

A. Yes, sir.

Cross-Q. 804. State generally for what machines, distinguishing between those for the Company, and those for other parties?

A. For the Company I devised a machine, and made drawings for a machine, for facing and turning lids for faucets; another machine for turning the pistons for faucets; a machine for drilling the faucets; a machine for making strainers for faucets; a cutting machine, for cutting the bottoms for strainers. There may be some others, that I do not now remember. I remember of making a drawing, and devising a machine for a Company termed the Mill Bush Company. There were a number of machines connected with that. There was a machine that they termed a roller machine. Another machine was called a slotting machine. Another machine called a punching machine, for punching out round rings or gaskets from raw hide; another machine for boring mill bushes. That is all that I can remember now.

Cross-Q. 805. Did you give all your time to the service of the Company, during the first year of its operations, and during the succeeding years, to the spring of 1870; and if not, what proportion of your time did you give the Company?

A. I didn't give them all my time; but the portion of my time I could hardly state. The first six months or a year I may have given them nearly all my time; the years afterwards, up to 1871 perhaps, I may have given them three-fourths of my time, more or less; I can't exactly state how much.

Cross-Q. 806. For what other parties did you do work during those three years?

A. I might mention some, but I can't hardly state the period. It may be within them three years; I done work for Mr. Eberly; also for Lee and Eberly. I think the work for Lee and Eberly was within them three years. I done some work for William Morris. I think he lived at Bridgeport at the time I did the work. There may have been some others that I can't remember now.

Cross-Q. 807. You mentioned that the Company gave you the privilege of staying there and doing work for yourself. Did that privilege extend to the use of the Company's machinery, tools and power, and did it extend during the whole time that the Company occupied the shop, when you were not in the employment of the Company?

A. Yes, sir; that was, though, for an equivalent; they had been using some of my tools, and I think it was considered that that was an equivalent.

Cross-Q. 808. You have spoken of the Mill Bush Company; what was the business of that Company; where was its business carried on, and who were the parties interested in it?

A. They were located at Shiremanstown. Their bushes were made by the Pump Company. There were four or five individuals in the Company, but I don't know whether I could remember their names now; some of them I might. Daniel Rupp, I think, was manager. William Sadler was one, John F. Teahl, and one or two others whom I can't now mention.

Adjourned until Tuesday, January 17, 1882, at 2 o'clock, P. M.

Tuesday, January 17, 1882, 2, P. M.

Adjourned until Wednesday, January 18, at ten A. M.

January 18, 1882, ten, A. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Cross-examination of Daniel Drawbaugh by Mr. Smith continued:

Cross-Q. 809. In your answer which I read from the record in the interference case, relating to your reading, you said you had read a good deal, more particularly on mechanical subjects. What books or publications had you been in the habit of reading upon mechanical subjects?

A. I was a subscriber to the *Scientific American* at an early period. The date I can't give you when I commenced taking it, or when I stopped taking it. I have in my possession a few works on mechanical subjects. I don't know whether I can give their titles. One of them was a mechanical encyclopedia, published in New York about the time of the first fair in New York; somewhere about 1852. I don't remember the exact date. I will refer to it and give you its title and date of publication tomorrow morning.

I borrowed a book from William R. Gorgas. It was an encyclopedia published about thirty years ago. I think it was an English book. It was in quite a number of volumes. I don't remember how many. That I had in my possession a long time, and read. I don't remember what the other books were. I only read some numbers of the last encyclopedia referred to. I did not read the whole work.

Cross-Q. 810. Did your reading extend to the subject of chemistry in any of its branches, or to any of the arts in which chemistry is an important part.

A. I don't remember. I read the book just as a general thing, for information on different subjects. I don't remember what particular subjects. When I read the *Scientific American* I generally read all articles that were of interest. I didn't pay particular attention—that answer will apply to all my reading. There is one subject that I remember I paid particular attention to, and that was on light—on photographing. In the work I got from Mr. Gorgas, I remember of reading articles on acoustics. That is all the subjects I remember of reading.

Cross-Q. 811. What Mr. Gorgas was that, and is he now living?

A. William R. Gorgas. He is now living in Harrisburg, here. He lived at that time in the neighborhood of Eberly's Mills,—about half a mile north-west. It is about three or four years, I suppose, since he moved to Harrisburg.

Cross-Q. 812. What did you do with reference to the subject of photography?

A. I fit up a small room and experimented a little in that direction. I made a camera myself, and purchased a few necessary chemicals, and experimented that way at spare times that I had.

Cross-Q. 813. How long ago was that?

A. My first camera that I made,—a temporary arrangement, was a few years after I was married. I married in 1854. I might say it was in 1857 that I first tried experiments, and to the best of my recollection—with those experiments—before the close of the war. I can't give you the exact period.

Cross-Q. 814. Did you make the lenses for your cameras?

A. I did not in the first camera. I did—I made lenses, I may say, a year or two after that.

Cross-Q. 815. Before you moved into the shop you now occupy, in the spring of 1867, what had you read or known on the subject of telegraphy, and in relation to the practical operations of telegraphing, as then practiced in the country?

A. I read a work on that, though I can't give you the title. I still have the book. I think it was called "The Practical Telegrapher," but I won't be positive. I will bring the copy of it over in the morning, and you can look at it and see the title.

Cross-Q. 816. In your answer to the 406th direct interrogatory, you said, referring to the speaking telephone invention, "Yes, sir: I intended to patent it. I had spoken to a number of persons to assist me. I would state to them that I would give them an interest in the invention, for them to furnish the money to have it patented," and in answer to the 408th and 409th interrogatories, you mentioned Christian Eberly and Frank Lee, as among the earliest persons to whom you spoke upon the subject. Will you give me the names of the other persons to whom you spoke upon the subject, and, as nearly as you can, the times at which you spoke to them?

A. I couldn't recall all. I spoke to a great many, but I can give you a few. I spoke to Captain Moore on the subject. That period was about 1875, to the best of my recollection. I also spoke to Henry Bayler, but that period I can't hardly get at. It might have been as early as 1872 or as late as 1874. I couldn't get at it accurately. I also spoke to Simon Oyster, and I think that was before I spoke to Bayler, to the best of my recollection. That is all that I can now remember.

Cross-Q. 817. In your answer to the 411th interrogatory, you said, among other things, "At the time I showed it to those parties, I was desirous of having it patented, but some of those parties tried it, and seemed to think it was not sufficiently complete; that it ought to be so that it could be placed on a table, and talk out; that seemed to be the idea." Were Moore, Bayler, and Oyster among those who seemed to think it was not sufficiently complete?

A. I don't remember exactly which of the parties. I know that is the impression that I formed; they may not have stated it in those words that I have stated there. I am pretty positive that Mr. Bayler said so, and Mr. Eberly. That is, to the best of my recollection.

Cross-Q. 818. Mr. Eberly, I understand, declined to take an interest in the invention; did Mr. Frank Lee also decline, and if so, for what reason?

A. Mr. Lee didn't go into it; I don't know what reason he had. My impression that I got about Mr. Eberly is, that if it had been some other machine, that he could have seen into the philosophy of it—some agricultural machine, or some simple machine, he would have took a hold of it. That was my impression, but as it was, he didn't.

Cross-Q. 819. Do you remember what Mr. Lee said about the invention, and about going into it?

A. I do not; I don't remember what he said; Mr. Eberly and Mr.

Lee called at the shop a number of times, and I showed them the machine.

Cross-Q. 820. Which machines did you show Mr. Lee?

A. I don't remember which machines. Whatever machines I would have had at the time of the visits, I would have showed them. I may have showed them the tumbler machine "F," and the tin can receiver "B," or the instrument "C," and receiver or instrument "I." I knowed I showed them instruments, but I am not positive which of the instruments. I am positive of showing them instruments at a very early time.

Cross-Q. 821. How long before Mr. Lee's death do you think it was, that you showed him instruments, and talked to him about taking an interest in the invention?

A. I could not positively say how long; it may have been four or five years, or not so long.

Cross-Q. 822. Do you think you stopped showing him the instruments, and stopped talking to him about taking an interest, as long as four or five years before his death?

A. I couldn't say when I stopped; they called on me quite frequently, and I showed them the machines pretty often, but I couldn't say when I showed it to them last, or when I spoke to them last concerning the matter.

Cross-Q. 823. Do you know why you stopped talking to Mr. Lee upon the subject, and exhibiting the instruments to him?

A. I don't know why. He died, and I don't remember exactly when he died. It may have been because he was dead. I don't know why he didn't call on me.

Cross-Q. 824. Mr. Eberly, I believe, thinks his death occurred in 1872; what is your recollection of the time of his death?

A. I don't remember, but I should suppose it to be a little later. By just guessing, I should suppose it to be about 1874, though I don't remember when he died.

Cross-Q. 825. Did you know of his death about the time it occurred?

A. Yes, sir; I had heard about the time it occurred. I think he took sick in Philadelphia, and, if I am not mistaken, he died in Philadelphia; though I may be wrong in that.

Cross-Q. 826. Did you show him your magnetic clock, and ask him to aid you about that?

A. I suppose I showed him my magnetic clock, but I don't remember of asking him to aid me in that, to the best of my recollection now.

Cross-Q. 827. Did you show him that at the times when you showed him the talking-machine?

A. I don't remember that I did. I may have.

Cross-Q. 828. What was the first thing that you did in applying electricity to the running of clocks?

A. At an early time, about the first year that they went to the shop below, where I now am, I took from the house a temporary arrangement; that is, a wooden pendulum rod about two feet and a half long, at the bottom of which was attached a permanent magnet; and an electro-magnet, not attached at that time. I took them down to the shop where I am now at, and placed it on to a shelf; that is, the upper end of the pendulum rod was attached to a shelf that extended out and was about six feet from the floor; at the bottom, below the permanent magnet, I placed the electro-magnet, on a bracket fastened against the wall of the shop. But prior to that time I had used it in the basement story of the house that I lived at then and now; that is, when I used it at the house; I had used it with a small battery. When I took it to the shop I was going to further experiment. I placed earth in a box. I put into that box a copper and a zinc plate; that is, a positive and a negative, and I kept that earth damp. I kept that pendulum moving at times—not all the time—by that arrangement.

At an after period, I put plates into the earth, but the time I can't exactly state. I don't know how long after I had it in the box, I connected it with the earth. Them were my first experiments in the clock.

Cross-Q. 829. At the time of the first experiments with the clock did you have a train of mechanism and a dial connected with the pendulum, to indicate time?

A. No, sir; I did not. I had mechanism, though, at the top of the pendulum to make and break circuit.

Cross Q. 830. The opening and closing of the circuit was effected, I suppose, by the swing of the pendulum?

A. Yes, sir.

Cross-Q. 831. What was the next thing that you did in relation to the magnetic clock?

[*Objected to by Mr. Hill as irrelevant and immaterial, and as new matter not proper in cross-examination.*]

A. I made changes in the electro-magnets. I don't remember all the changes or experiments that I did do. I could state, though, what next or about next. My first electro-magnet was composed of soft iron cores, bent in the form of a horse-shoe, and the wire wound around the cores by hand; the next was an electro-magnet made of a flat piece formed like a permanent magnet, having its poles wrapped with insulated wire. I could indicate it better by making a sketch.

[*Witness draws sketch, which is marked "Clock Diagram No. 1," and says:*]

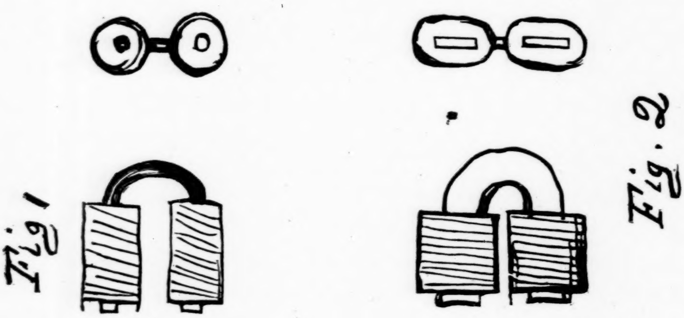


Figure 1 represents my first electro-magnet, above described, and figure 2 the second.

This next magnet I remember distinctly. There may have been some others, but this was the next. It was a flat, steel horse-shoe blade, with its poles wrapped with insulated wire.

Cross-Q. 832. What was the size of these magnets, and what was the size of the wire used in the coils?

[*Same objection by Mr. Hill.*]

A. I don't exactly remember the size of the magnets nor the size of the wire. The first one, I know, was composed of coarser wire than the second; but the guage number of the wire I don't remember.

Cross-Q. 833. What was the next thing you did in relation to this invention.

[*Same objection by Mr. Hill.*]

A. I put a train of gearing in, but that wasn't till a good while after. I don't know whether I could give the period when I did that, that is, I don't remember the time.

Cross-Q. 834. Will you reflect a little and then give your best judgment as to the time when you first put the train of gearing on ?

[*Same objection by Mr. Hill.*]

A. I hardly know ; it may have been three months, six months or a year.

Cross-Q. 835. Three months, six months or a year after what time ?

[*Same objection by Mr. Hill.*]

A. Well, after trying the first experiments.

Cross-Q. 836. Had you made any further experiments with the pendulum alone, beyond what you have stated, before you put the train of wheel-work on ?

[*Same objection by Mr. Hill.*]

A. I don't remember that I did.

Cross-Q. 837. Did you make the train of wheel-work, or did you use one that belonged to some other clock ?

[*Same objection by Mr. Hill.*]

A. I made it. I made it by hand. That is, I have reference to the ratchet wheel. A few of the wheels were out of another clock movement.

Cross-Q. 838. Did you make the frame-work for supporting the train of gearing ; and if so, of what did you make it ?

[*Same objection by Mr. Hill.*]

A. I made the frame work, and, if I am not mistaken, it was just made of a board with pins placed. I think it was just wood, (I could describe that—make a sketch of the manner of the first one that was made,) because it was got up just as a temporary trial. I might, maybe, describe it without a sketch. I will try.

[*Witness asks Complainant's counsel whether he shall give an explanation with all its details, and counsel directs him to give a general description, in order not to consume more time.*]

It was composed, as before stated, of a pendulum and the following parts: Said pendulum moved a rachet wheel by means of a pawl; that rachet wheel had sixty teeth; said wheel had a tubular shaft; on the said tubular shaft was one pin or arm.

A second train, with sixty teeth or notches.

Each revolution of the first rachet wheel, which would make a complete revolution once every minute, would move the second wheel one notch, which would be one revolution in one hour.

The second train also had a tubular shaft; around that was a second tube, which second tube had four pins or arms.

Around the second tube was a third tube, having a wheel which was operated by the pins of the tube, and each fourth of a revolution of the second wheel caused a fourth of a revolution of the third tube.

The second wheel had one hand, which denoted the minute, and the third outside tube carried a hand which denoted the hour. That will be a general description. It was composed of few parts.

Recess for dinner until 2 o'clock, P. M.

WEDNESDAY, *January* 18, 1882, 2 P. M.

Examination resumed, pursuant to adjournment.

[*The witness says that the answer above does not express his idea, and continues:*]

One revolution of the minute hand would cause one twelfth of a revolution of the hour hand, by means of those four arms.

Those wheels were supported by studs fastened into the base. There was no journals; they were kept in place by pins or studs. There was no front frame, only a base. There was no frame particularly. There was a bracket screwed on to the base, which extended over the wheels to keep them in their places on the pins or studs.

Cross-Q. 839. Was this clock provided with a dial and kept running continuously for any length of time, or at different periods? If so, what sort of a dial and how long was the clock kept running?

[*Same objection by Mr. Hill.*]

A. This clock wasn't provided with a dial. It had the parts that I stated before. It was run at times, not continuously. I afterwards made another more complete, and that one was provided with a dial. The length of time between the first one and the one last mentioned I don't remember.

Cross-Q. 840. Did the first one have the same magnet and electro-magnet which you had previously used in connection with the pendulum alone?

[*Same objection by Mr. Hill.*]

A. I think it had the same permanent magnet, and part of the time, I think, it had the same electro-magnet.

Cross-Q. 841. What kind of a battery did you run with it?

[*Same objection by Mr. Hill.*]

A. When I first had it at the house—and I may have used that battery at the shop—I had what is called a sulphate of copper battery—a copper vessel filled with a saturated solution of sulphate of copper, with a zinc cylinder in the solution of copper. That was not a very permanent battery. It would only run the clock perhaps a day. In that way, I discovered that it would take a very light electric power to run a clock. It may only run a half an hour with any strength; then it decreases. I don't remember the exact length of time it would run the clock. It may have been a day or more. By that, I discovered that it would only take a very weak current to run the clock, for, although it would get very weak, it would still run the clock.

This first clock was run with an earth battery, but I may have used another battery with it at particular times.

Cross-Q. 842. Was this first clock, which had the train of gearing, ever set up in your house?

[*Same objection.*]

A. No, sir.

Cross-Q. 843. Did you build the second clock—the one that had a dial?

[*Same objection.*]

A. Yes, sir; I built that.

Cross-Q. 844. Did you keep the first one, after you had built the second one and had it set up in your shop?

[*Same objection.*]

A. It was temporary made. I may have kept some parts. There may be some parts of it yet.

Cross-Q. 845. Were they both set up at the same time in your shop?

[*Same objection.*]

A. No, sir.

Cross-Q. 846. Did you use any portion of the first one in constructing the second. If so, what portions?

[*Same objection.*]

A. I think, to the best of my knowledge, I did—some of the brackets and, perhaps, some of the the gear wheels.

Cross-Q. 847. Did you make the dial for the second clock. If so, how was it made.

[*Same objection.*]

A. Yes, sir; I made the dial. It was made out of Bristol board.

Cross-Q. 848. In what respect did it differ from the first clock, besides having a dial?

[*Same objection.*]

A. It was made on about the same principle, but it was made in a better style. I then again used a wooden pendulum, but got it up in a better form.

Cross-Q. 849. Did you make a new magnet, and electro-magnet for it?

[*Same objection.*]

A. I think afterwards. At first I suppose I used the same magnets.

Cross-Q. 850. Was it provided with a case?

[*Same objection.*]

A. A temporary pine case, part of the time.

Cross-Q. 851. Whereabouts in your shop was it set up, and how much was it run?

[*Same objection.*]

A. It was set up in a small private room by the stair-case. I can't say how long it was run—several years.

Cross-Q. 852. How was it run—by what battery?

[*Same objection.*]

A. As a general thing, by the earth battery.

Cross-Q. 853. What kind of plates, and how large, did you use for the battery, and where were they situated?

[*Same objection.*]

A. Copper and zinc plates were used. At first I had them in a box. At first I used plates ten by thirteen or fifteen inches. At times I used plates in the earth, that were perhaps eighteen or twenty inches square; and at other times I had put in plates that were perhaps two feet or more square. I don't remember whether I used the plates in the box with this clock, but I may have used it. I had the battery at different places on this clock. The first plates, I think, were buried in the ground at the

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east side of the shop. I won't be too positive. I may have had a set of plates in the basement or cellar of the shop, to this clock.

Cross-Q. 854. Did you use more than one set of plates at a time—that is, one zinc and one copper plate?

[*Same objection.*]

A. To the best of my recollection, I did not.

Cross-Q. 855. Was this clock constructed and set to running before the Haucks moved into that shop?

[*Same objection.*]

A. Oh, yes; a good while before.

Cross-Q. 856. State, as nearly as you can, how long before?

[*Same objection.*]

A. It may have been three or four years before. May be a little more. That is, I had reference to the first clock, but I don't know exactly how long after I made the first one I made the second. The second clock may have been made three or four years before the Haucks came there, but I ain't positive.

Cross-Q. 857. How long was the second clock run, before you built another?

[*Same objection.*]

A. I can't hardly say that, but there was a considerable lapse of time between that, and building another; but the length of time I don't remember.

Cross-Q. 858. Was that second clock ever taken out of your shop and carried to any other place?

[*Same objection.*]

A. Perhaps part of them movements was put into another clock, that was afterwards taken out of the shop. I think it was in a period about 1875, that I made some little changes, and made a case—a walnut case, and during the time that I lived at Mechanicsburg, I took it and placed it in Mr. Shapley's jewelry store, but the exact period I couldn't give.

Cross-Q. 859. What were the changes that you made in that second clock, besides putting it into a walnut case?

[*Same objection.*]

A. I made some changes on the pendulum; I think I made a new wooden pendulum, and a pendulum ball, and some changes in the moving parts; I don't remember exactly what the changes were. That is as near as I remember it.

Cross-Q. 860. Was that the only clock of that kind, that you constructed, before it was carried to Mechanicsburg?

[*Same objection.*]

A. I don't remember right whether—but it occurs to me that I had two; I think there was another, but I won't be too positive about that, now.

Cross-Q. 861. Do you think you had two set up and running in your shop, before that second clock was carried to Mechanicsburg?

[*Same objection.*]

A. I think so; I won't be too positive, though. I can't remember right.

Cross-Q. 862. Was the third one, if there was one, constructed like the second one?

[*Same objection.*]

A. You see, the way I look at it, I don't think there was a third one there was always parts of it remaining. It was a modification, but you couldn't call it another clock—not the way I look at it.

Cross-Q. 863. Do you, or do you not think, that before the clock was carried to Mechanicsburg, you had another set up and running in your shop at the same time that the one carried to Mechanicsburg was set up and running in your shop?

[*Same objection.*]

A. I think so, but I ain't too positive. If I am allowed, I can investigate that this evening, but I don't know it now.

Cross-Q. 864. Mr. Jacob E. Shettel, a witness heretofore called by the Defendants, says (page 226) [216] that there was, at the time he was speaking of, one electric clock running there, controlled by a large eight-day clock; do you remember about that arrangement of clocks?

[*Same objection.*]

A. Yes, sir.

Cross-Q. 865. Where did you obtain those two clocks; that is, the eight-day clock, and the clock that was run by it?

[*Same objection.*]

A. The eight-day clock I bought at a public sale, and the other I made myself; that is, the one that was controlled by the eight-day clock, I made myself.

Cross-Q. 866. When and where did you buy the eight-day clock, and what did you pay for it?

[*Same objection.*]

A. The eight-day clock I bought at Martin Zimmerman's sale. I can't tell when, nor what I paid for it; it might have been in 1866, 1867, 1868 or 1869. I can't get at it any nearer than that. I might have paid two or three dollars for it.

Cross-Q. 867. When did you build the clock that was run by it?

[*Same objection.*]

A. I could hardly state accurately that. I don't know. It may have been between 1869 and 1872. That I might ascertain, too.

Cross-Q. 868. Will you please ascertain these facts, as far as you can, and report them in the morning?

A. I will try.

Cross-Q. 869. Will you describe generally the mechanism of this clock, which was run by the eight-day clock, and the case it had, if it had one?

[*Same objection.*]

A. There was a metal frame or base, I think, of iron. I won't be too positive about that, but I think it was iron. On that was secured an electro-magnet.

In front of it was an armature. The armature was secured, I think, to the iron frame by a stud that was fastened into said frame.

The upper end of the armature was loosely fitted on to said stud, and said armature was free to vibrate; around said armature was secured a soft iron frame; said frame fit up closely to the armature, but still allowed it room to vibrate; the armature was of steel and was polarized; that is, it was made as a bar or permanent magnet. The electro-magnet induced magnetism in the soft iron frame, and by that means caused the armature to vibrate; by that means, I could move that armature with a great deal less battery power than I could without the soft iron frame. Towards the lower edge of said armature was attached a pawl; the opposite end of said pawl worked into the teeth of a ratchet wheel.

The balance of the movements were similar to the one I described before.

The case was a round or turned case made of walnut wood.

Cross-Q. 870. Was this mechanism some of your own devising?

[*Same objection.*]

A. Yes, sir.

Cross-Q. 871. Did you build more than one clock of that kind?

[*Same objection.*]

A. No, sir; only that one of that kind.

Cross-Q. 872. Whereabouts in your shop were these two clocks, the eight day clock and the one you have just described, set up and run, and when was it first done?

[*Same objection.*]

A. The eight-day clock was in the small room, in the north-east corner of the shop by the stairs, shown on the diagram on page 921 [947]. The other, that is, the electric clock, was changed to different places. First, I think, it was placed in the same room, and afterwards in the working department.

It may have been at some other parts of the shop. I don't remember all of them in the different places.

I did say before, that the eight-day clock was bought and placed there between 1866 and 1869. I can't tell exactly.

The other, as I stated before, was made between 1869 and 1870, or 1872. I can't remember the date.

Cross-Q. 873. What kind of a battery did you use in connection with these two clocks, and where was it placed?

[*Same objection.*]

A. It was a battery that I made in the form of a Daniell battery—a vessel with a porous cup. It was a very small battery, about four inches high, and about two inches in diameter.

The most of that time, that battery was in the same room that the eight-day clock was. It was standing on the floor, part of the time, right back of the clock.

Cross-Q. 874. How long did you continue to run these two clocks in connection with each other?

[*Same objection.*]

A. I hardly know. Perhaps one, two, or three years—not constantly, you know—sometimes they were not running.

Cross-Q. 875. I suppose the eight-day clock opened and closed an electric circuit, which connected the two clocks with the battery. Is that so?

[*Same objection.*]

A. Yes, sir.

Cross-Q. 876. Was the circuit opened and closed by the pendulum at each vibration made?

[*Same objection.*]

A. Yes, sir.

Cross-Q. 877. What object had you in devising and getting up this last clock which you have described?

[*Same objection.*]

A. My idea was, that you could have a regulating clock and run a number of clocks in a city by this main regulator.

Cross-Q. 878. Did you propose to patent it if it proved successful?

[*Same objection.*]

A. Yes, sir; that was the idea. I wanted a party to take an interest in it—different parties.

Cross-Q. 879. What parties did you apply to to take an interest in this invention, and what proposition did you make to them?

[*Same objection.*]

A. I don't remember what parties. I know I spoke to different parties, but just to name them, I can't. The proposition would be about the same that I made to parties about my other inventions. My general proposition was, to give an undivided one-half interest to a party who would furnish money to take out a patent and run the business. I don't remember what proposition I made about this, but that was the general proposition that I made.

Cross-Q. 880. Did you ever take any steps to obtain a patent on this clock?

[*Same objection.*]

A. No, sir.

Adjourned until January 19, 1882, at ten, A. M.

January 19, 1882, ten A. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Cross-examination of Daniel Drawbaugh by Mr. Smith continued:

Cross-Q. 881. Have you, since the adjournment, ascertained what changes you made in the clock which had the Bristol board dial, before you carried it to Mechanicsburg, besides putting a walnut case to it?

[*Same objection.*]

A. I haven't been thinking over that since. I don't remember what changes, more than what I stated before.

Cross-Q. 882. Have you ascertained whether or not, before you carried that clock to Mechanicsburg, you had constructed another, aside from the one which was run by the eight-day clock?

[*Same objection.*]

A. Yes, sir; and think the other was made before the one I carried to Mechanicsburg. I think so, but I ain't too positive. I can't remember all these little circumstances.

Cross-Q. 883. You described yesterday, a clock mechanism, which was never provided with a dial, and which we have spoken of as the first clock. You then said that you used portions of that clock in building a second one, and that you did not have both at the same time. This second clock, you said, had a Bristol board dial, and was finally carried to Mechanicsburg. Did you construct another clock of the same kind, before you carried the second clock to Mechanicsburg, making three in all, up to this time?

[*Same objection.*]

A. I stated that parts of the first clock were used on the second, so I couldn't call that a clock. There would be three counting that as a clock. Since thinking over it, I don't remember which one I used the parts of the first clock in,—whether in the one I took to Mechanicsburg, or the one that I made before that.

Cross-Q. 884. Then, if I understand you, you think that before you carried that clock to Mechanicsburg, you had constructed three clocks of that kind, including the one which was never provided with a dial, and parts of which were used in the construction of another. Is that what you mean to say?

[*Same objection.*]

A. Yes, sir; providing you term the first one a clock.

Cross-Q. 885. Now, at the time you carried the clock to Mechanicsburg, had you another one of the same kind which you had constructed, and which was then in existence?

[*Same objection.*]

A. Yes, sir; though not made exactly in every respect like the one I took to Mechanicsburg, but in general principle the same.

Cross-Q. 886. Was this third clock, as we will term it, set up and run in your shop before you carried the clock up to Mechanicsburg, and were the two, at any time before that, set up and running at the same time in your shop?

[*Same objection.*]

A. Yes, sir.

Cross-Q. 887. When did you build this third clock—how long before you carried the clock to Mechanicsburg?

[*Same objection.*]

A. I can't say. I don't remember the date, or nearly the date, even.

Cross-Q. 888. Was it before Haucks moved into the shop?

[*Same objection.*]

A. I think not.

Cross-Q. 889. Was it before the Axle Company moved in?

[*Same objection.*]

A. I think it was during the time they were there. I will state, it was made before I moved to Mechanicsburg. I know that. That is to the best of my recollection.

Cross-Q. 890. You were accustomed to speak of the clock which was run with the eight-day clock, as an electrical clock; were you not?

[*Same objection.*]

A. Yes, sir; I generally termed it that; but both were called that sometimes.

Cross-Q. 891. You were accustomed to speak of the other clocks, which you have mentioned, like that which went to Mechanicsburg, as magnetic clocks; were you not?

[*Same objection.*]

A. Yes, sir; I generally termed it so, but some people called it by the name of electric clock.

Cross-Q. 892. Whereabouts in your shop was the third clock set up and run, while the second clock was running in your shop, and before it was carried to Mechanicsburg?

[*Same objection.*]

A. Those clocks were run at various places in the shop. I don't remember exactly where. I had two clocks of that kind at one time in that wood-working department of the shop, but I don't know at what period that was.

Cross-Q. 893. Did you have two clocks in that wood-working department before you carried the clock to Mechanicsburg?

[*Same objection.*]

A. I don't remember that. I don't remember at what period.

Cross-Q. 894. How long did the clock remain at Mechanicsburg, and, when it was brought away, was it brought back to your shop?

[*Same objection.*]

A. I don't know how long it was at Mechanicsburg. I know it was brought to my shop, and my impression is, that it was brought from Mechanicsburg to my shop; that is to the best of my recollection.

Cross-Q. 895. Was it brought back from Mechanicsburg at the same time that you moved back from there?

[*Same objection.*]

A. I don't remember when it was, though I think it was brought back in 1877.

Cross-Q. 896. When you carried it to Mechanicsburg, did you carry it in the black walnut case, which you say you made for it in 1875?

[*Same objection.*]

A. Yes, sir; it was a black walnut case.

Cross-Q. 897. Will you describe that case—state how large it was, and what were its general features?

[*Same objection.*]

A. I will try, as near as I can remember. The extreme length of the case may have been five feet perhaps, may be more—a little; there were two doors; one a round door covering the dial, and another door below, enclosing the pendulum; there was no glass in the frame of the door, nor in the door below. The case was somewhat ornamented by carvings, but I could not give the nature of the carvings; I am just approximating. I don't know whether I am right, exactly. The width may have been fifteen inches, more or less. I don't remember.

Cross-Q. 898. Did you do the carvings on the case?

[*Same objection.*]

A. Yes, sir; some of it; and I think some was done by George Drawbaugh, but I won't be too sure.

Cross-Q. 899. Did you keep the Bristol board dial on that clock, after you put it in the black walnut case?

[*Same objection.*]

A. I don't remember. There is a Bristol board dial on it yet, I think. I remember that while it was at Mechanicsburg, the dial became broken or bent, and a new dial was put on, but the new dial was of Bristol board. Still, I won't be too positive. I think so, but I won't be too positive.

Cross-Q. 900. While the clock was at Mechanicsburg, where was it kept?

[*Same objection.*]

A. I think I stated that before—at Mr. Shapley's jewelry store.

Cross-Q. 901. Was it set up and run there?

[*Same objection.*]

A. Yes, sir.

Cross-Q. 902. Was the running-gear of that clock made of sheet brass or of brass castings?

[*Same objection.*]

A. If I remember right, part of it was made of sheet brass, and part of it of brass castings.

Cross-Q. 903. Was the running-gear fastened to a wooden base, or metal base or frame?

[*Same objection.*]

A. I think it was a metal base, and the metal base was fastened to the wooden back of the case, I think.

Cross-Q. 904. For what purpose was the clock carried to Mechanicsburg?

[*Same objection.*]

A. If I remember right, I think Mr. Shapley asked me to bring it up. I know at different conversations that I had with him I got an idea that he would like to have an interest in some way, and I was anxious to have some one take an interest. After I took the clock there, we spoke some on the subject; he said that he had two thousand dollars that he would invest in it, and I was very glad to get somebody to invest. He, after that, made a clock or got a case, and had parts of the clock made for him. I made some parts of it for him. He never furnished the two thousand dollars. Some time after that I seen Mr. Shettel, though how long after that I don't remember. I told him about that clock, and that we were negotiating arrangements between Shapley and I, and that I was anxious to make an arrangement. He said he would see his brother-in-laws, and he thought may be he could make arrangements. The names of his brother-in-laws were Theodore Grissinger and Jacob H. Grissinger. He then seen his brother-in-laws, but how long after that, I don't remember exactly.

Cross-Q. 905. Did you make a definite bargain with Mr. Shapley to sell him an interest in the clock; if so, what was the bargain?

[*Same objection.*]

A. I don't know exactly about the definite bargain. He said he would furnish two thousand dollars; and then there was a small instrument of writing that I think I signed, or perhaps both of us signed it, drawn up there, and I don't remember what it was. It was not an article of agreement—just a few lines; but I think it related to giving him the first chance, or something in that way.

Cross-Q. 906. What interest was he to have, and what price was he to pay for it, or what was the talk with respect to those things?

[*Same objection.*]

A. I don't remember of anything except that he said he would go into the business and put two thousand dollars in it. There may be other talk. I suppose I offered him the one-half, as I was in the habit of doing—a half interest in nearly all my other inventions.

Cross-Q. 907. Did Mr. Shapley visit your shop while these negotiations were going on, or at any time, in connection with the clock; and, if so, how often and for what purpose?

[*Same objection.*]

A. He was at my shop several times, but I don't remember that we talked anything about the negotiations. He came down several times and brought part of a clock along,—I have reference to the clock that he partly made. One time I remember he brought his pendulum and filled it at my shop with lead. He may have been there two or three times—I do not remember the number.

Cross-Q. 908. State as nearly as you can when these visits were made.

[*Same objection.*]

A. I couldn't exactly state; it may have been the latter part of 1876 or it may have been the spring or summer of 1877; I ain't positive.

Cross-Q. 909. When you brought your clock away from Mechanicsburg, what did you do with it?

[*Same objection.*]

A. It is in the shop yet; I have got it yet.

Cross-Q. 910. Was it set up in the shop and set to running, and has it been there all the time since?

[*Same objection.*]

A. It has been there all the time since, to the best of my recollection; it has not been all the time running; I don't remember whether it was set to running when first brought back, but I think so.

Cross-Q. 911. Has it now the same black-walnut case which you say you built for it in 1875?

[*Same objection.*]

A. Yes, sir; with the exception that there was a little change; it was finished up—shellaced and varnished, and some little change, I don't remember what, in the carvings.

Cross-Q. 912. Have any other changes been made in that clock, either in the case or in the mechanism?

[*Same objection.*]

A. No; not to the best of my recollection.

Cross-Q. 913. Has it ever had a glass door or glass front, which showed all the works?

[*Same objection.*]

A. Never had no glass door. That is, it never had glass in the door. The center of the dial was cut away to show the interior movements, or part of the movements.

Cross-Q. 914. While this clock was at Mechanicsburg, was the clock, which we have called the third one, set up and running in your shop?

[*Same objection.*]

A. I think so, but I ain't sure. I guess part of the time it had.

Cross-Q. 915. Was the running part of that clock made of sheet brass or brass castings, and did it differ in any respect from the clock which went to Shapley's?

[*Same objection.*]

A. It was part of it made of sheet brass and part of cast brass. I think it did differ, though in what particular I don't remember. The general principle was the same.

Cross-Q. 916. What kind of a dial and case did it have?

[*Same objection.*]

A. One of those two clocks at one time didn't have any dial. There was figures drawn with a pencil on the back or base-board, opposite the hands. Then, at another time, I made a dial out of ordinary drawing paper—just roughly made. It had no more than the base-board part of the time. Then there was a case made. I don't remember how long after that—a walnut case.

Cross-Q. 917. Will you describe this walnut case, and state, as nearly as you can, when it was made?

[*Same objection.*]

A. It was composed of walnut boards. That is, two walnut board sides, a top, a bottom, and an open door-frame, covering the whole case of the clock. There was a few carvings on the top and sides of the case. It may have been made in 1875, 1876, or 1877. That is as near as I can get at it.

Cross-Q. 918. What were the dimensions of this case and of the opening in the door frame?

[*Same objection.*]

A. The opening in the door frame may have been in length three feet and a half, and in width perhaps fourteen inches, as near as I can now state it. The height of the case may have been four feet perhaps—maybe a little more. In width say, fourteen or fifteen inches, as near as I can get at it.

Cross-Q. 919. Was this clock door ever provided with a glass? If so, when and where did you procure it and what did it cost?

[*Same objection.*]

A. There never was a glass put in it. There was a glass procured at the time Shettel and the Grissingers went into the Clock Company—that summer, I think. They bought it, and paid for it, I guess.

Recess for dinner until 2, P. M.

Jan. 19, 1882, 2, P. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Cross-examination of Daniel Drawbaugh by Mr. Smith continued.

Cross-Q. 920. What was done with this third clock after the second clock came back from Mechanicsburg, and where is it now?

[*Same objection.*]

A. I don't know what was done with it. There wasn't anything done. It is at the shop now.

Cross-Q. 921. Did you do anything about building more clocks while the second clock was at Mechanicsburg? If so, what did you do?

[*Same objection.*]

A. Nothing that I remember of.

Cross-Q. 922. Did you build the running-gear of the first clock yourself?

[*Same objection.*]

A. Yes, sir; to the best of my recollection I made the running-gear.

Cross-Q. 923. I wish now to confine your attention to the period after the clock came back from Shapley's and before the time when you made the arrangement with the Grissingers, which, I understand, was in the spring of 1878. Did you construct any clocks during that period, or have any constructed, at your shop?

[*Same objection.*]

A. Yes, sir; I think there was one.

Cross-Q. 924. Will you give a description of that one, and state what was done with it, and where it now is?

[*Same objection.*]

A. The construction of the moving parts was about the same as I have described before, as near as I can remember. The case was a little more handsomely made. It would be hard for me to describe it in every detail. I will endeavor to describe it in its dimensions as nearly as I can. The case may have been about five feet and a half, or maybe six feet in length; the width of it may have been sixteen or eighteen inches, and the depth of the case from front to rear six or eight inches. The dial was made of glass. The figures were gilded. There were two doors, one for the dial and one for the lower part of the case, where the pendulum was placed. The pendulum was a compensating pendulum of steel and brass, but was not what is termed a "grid-iron pendulum." It had a compensating lever in it.

Cross-Q. 925. Was the train of gear mechanism visible through the glass dial?

[*Same objection.*]

A. Partially so; the dial was frosted.

Cross-Q. 926. Was the dial plate round or square? What was the diameter of the circle within which the figures were placed?

[*Same objection.*]

A. The dial plate was round. I couldn't actually give the diameter of the circle in which the figures were placed; the diameter of the dial plate was about twelve or thirteen inches, to the best of my judgment.

Cross-Q. 927. Where did you obtain that dial plate, and what price did you pay for it?

[*Same objection.*]

A. I don't know where I obtained the glass. I cut the dial out of a plate of glass; I prepared it for lettering; I cut a hole in the center for the hour and minute hands, and another hole two or three inches from the center for the second hand. I did that on a lathe. Mr. Isaac Lloyd, of Harrisburg, did the gilding; I don't think it cost me anything—the gilding. I think he presented that—the work to me.

Cross-Q. 928. Was there a glass in the lower door; if so, what were its dimensions?

[*Same objection.*]

A. Yes, sir; there was a glass in the lower door. Its dimensions I don't remember. I will give that to the best of my judgment, if you will allow me. It may have been two feet and a half long, by, perhaps, eight or nine inches wide.

Cross-Q. 929. Where did you procure that glass, and what did it cost you?

[*Same objection.*]

A. I don't know exactly where I got that glass. I think I procured it in Harrisburg. It may have, may be, cost fifty cents, or perhaps less; it was not a plate glass.

Cross-Q. 930. Was any part of the clock mechanism visible through it?

[*Same objection.*]

A. Yes, sir; the pendulum was visible through it.

Cross-Q. 931. Was the train of gearing made out of sheet brass, or from brass castings, and was it carried on a wooden base, or on a metal one?

[*Same objection.*]

A. It was composed of both sheet brass and cast brass; the movement was secured to a metal base.

Cross-Q. 932. Did you make any patterns for castings for any part of this clock; if so, for what parts?

[*Same objection.*]

A. Yes, sir; I made patterns. There was a pattern for the base, patterns for some of the gear wheels, and patterns for the brackets, for the purpose of keeping the wheels to the studs in the base.

Cross-Q. 933. Did you do the work on this clock yourself, including the making of the patterns and the making of the case?

[*Same objection.*]

A. I made the patterns for the brass castings, and I made the movements. George Drawbaugh made the principal part of the case; I made some of the carvings on the case.

Cross-Q. 934. Can you give us any idea how the clock was ornamented by carvings or mouldings?

[*Same objection.*]

A. That would be pretty difficult to answer; I couldn't describe the nature of the carvings. It couldn't be done by words, or I can't do it by words.

Cross-Q. 935. Was it provided with an ornamental top and base?

[*Same objection.*]

A. It was provided with an ornamental top and sides, or edges, of the case, not a particular ornamental base. There was a base made after the Grissingers went into the Company. That base was made to set it on when exhibiting. That clock had been on exhibition.

Cross-Q. 936. For convenience, we will call this clock the fourth clock. Will you state what was done with it after it was completed, and before the Grissingers became interested in it, which, I understand, was April 1, 1878?

[*Same objection.*]

A. I don't know that I can answer that. There wasn't anything done. It was set up in the shop, and run part of the time. It wasn't running all the time.

Cross-Q. 937. Whereabouts in the shop was it set up and run?

[*Same objection.*]

A. Part of the time it was set up in the wood department and run, and in the small private room next to the stairs, and it had been in the large part of the shop, south of the wood department of the shop.

Cross-Q. 938. Was it put on exhibition before the Grissingers came there? I mean, anywhere outside of your shop.

[*Same objection.*]

A. To the best of my recollection, it was not.

Cross-Q. 939. To the best of your recollection, how long was it before the Grissingers came there that it was first set up and run in your shop?

[*Same objection.*]

A. That is hard for me to state. I think the case was made some time in 1877, if I ain't mistaken. The movements may have been made in 1876. The movements were made a considerable time before the case, but I won't be positive about them dates. Dates knocks me, sometimes.

Cross-Q. 940. When, and where, and by whom was this clock first exhibited, outside of your own shop?

[*Same objection.*]

A. I won't be too positive, but I think it was in the spring or first part of the summer of 1878, in this city—Harrisburg—by Mr. Johnson Leonard.

Cross-Q. 941. Did you sell the clock to Mr. Leonard, or make any bargain with him to sell it to him, or did you employ him to exhibit it?

[*Same objection.*]

A. I didn't make a bargain. It was a Company—Shettel, the Grissingers, and myself—had made a bargain, and he had contracted for the clock, but the price of it I don't remember now. He had the control of exhibiting.

Cross-Q. 942. Was there a written contract with Mr. Leonard with reference to the matter?

[*Same objection.*]

A. Not that I remember. I don't remember that there was. There may have been, though I don't remember.

Cross-Q. 943. While that clock was on exhibition here, were there any notice of it in the Harrisburg papers?

[*Same objection.*]

A. I believe there was.

Cross-Q. 944. At what place in Harrisburg was it exhibited, and for how long a time was it on exhibition?

[*Same objection.*]

A. It was in Market street. The number I don't remember—several blocks down the street. I hardly know for how long it was on exhibition; for one, two, or three weeks, perhaps. I don't remember how long.

Cross-Q. 945. Were you present during any part of the time while it was on exhibition?

[*Same objection.*]

A. I was there a few times. I don't remember the number of times. Mr. Leonard invited me to come over several times, I remember; that there were some parties wanted to see me—wanted a description of the clock. He couldn't describe it.

Cross-Q. 946. Do you remember who those parties were?

[*Same objection.*]

A. I remember one party, though I can't give his name. There was a gentleman here from Boston. I came over one day on purpose to see him.

Cross-Q. 947. Where did Mr. Johnson Leonard reside, and how long had you known him at the time the arrangement was made with him?

[*Same objection.*]

A. My impression is, that he resided in Harrisburg. He was sometimes over in my neighborhood. His father-in-law lives over there. I had known him four or five years prior to that time, as near as I can remember.

Cross-Q. 948. Is he any relation to George Leonard, who formerly resided at Eberly's Mills, and who has been called as a witness for Defendants?

[*Same objection.*]

A. Yes, sir; he is a son of Mr. George Leonard.

Cross-Q. 949. Who is his father-in-law?

[*Same objection.*]

A. Henry Stephens.

Cross-Q. 950. Was there a written contract with Johnson Leonard, in relation to the clock?

[*Same objection.*]

A. I don't remember. My impression is that there was not more than a verbal contract. I don't know.

Cross-Q. 951. What was done with this clock after its exhibition in Harrisburg was closed?

[*Same objection.*]

A. Mr. Leonard had taken it to Lancaster—I think Lancaster—and exhibited it at Lancaster.

Cross-Q. 952. What was next done with it?

[*Same objection.*]

A. I should rather say, that before he took it to Lancaster, the arrangement was that he should pay for the clock, and he had promised to pay for it and neglected to do so. He then took it to Lancaster rather in a disguised way, and the parties that composed the Company were dissatisfied, but they allowed him to exhibit it there. After he was through exhibiting there, he sent it to the West, without letting us know, and our impression was, that he was going to run away with the clock, and we sued him for it. He returned the clock. There is one thing I forgot to mention. When he was exhibiting here at Harrisburg, he took in a partner, a Mr. Warner. His given name I don't remember.

Cross-Q. 953. Did Mr. Leonard pay anything on the clock—if so, how much?

[*Same objection.*]

A. I think he did pay a small amount, though I don't remember what that amount was. The Grissingers collected the amount, I think.

Cross-Q. 954. Do you know whether they returned the money when he returned the clock?

[*Same objection.*]

A. I don't know whether they did or not, but I think some part of the money was retained for expenses of shipping, or some other expenses. I think something was said. I don't remember the particulars of it.

Cross-Q. 955. What was done with the clock after Mr. Leonard returned it, and where is it now?

[*Same objection.*]

A. After that there was a party, or I think two parties, who had bought the clock. One was named Willet, I think, and the other, I think, was Mr. Warner, mentioned above. They exhibited it at a few places, or for a while, and then they sold it to a party in Harrisburg. That party I don't remember the name of. If it is necessary, I can ascertain it. The clock is now in New York, I believe, in the care of Mr. Marx.

Cross-Q. 956. After the sale to the party in Harrisburg, whose name you do not remember, did that clock ever come again into your possession, or into the possession of the Company by which it had been sold?

[*Same objection.*]

A. It never came into my possession. Mr. Chellis got possession of it afterwards.

Cross-Q. 957. Besides what was done on this clock after the clock came back from Mr. Shapley's, and before April 1, 1878, when the Grissingers took hold of the business, was there anything else done on clocks at your shop? If so, what was it?

[*Same objection.*]

A. No other.

Cross-Q. 958. After the Grissingers took hold of the business, what was done in relation to building clocks?

[*Same objection.*]

A. There were two clocks made while they were in the business.

Cross-Q. 959. Were there any made after they quit the business?

[*Same objection.*]

A. No, sir.

Cross-Q. 960. Were those two clocks, which were made while the Grissingers were in the business, made at the same time, or was one made after the other?

[*Same objection.*]

A. I think there was a time elapsed between the making of the two clocks, but the time I don't know; that is to the best of my recollection.

Cross-Q. 961. Was the first one built soon after the Grissingers took hold of the business?

[*Same objection.*]

A. I think so; I don't remember the length of time after they went into the business.

Cross-Q. 962. How did the running mechanism of this first clock built by the Grissingers correspond with that of the clock you have been speaking of, which Johnson Leonard exhibited?

[*Same objection.*]

A. The general principle of the movements were the same; the case was more elaborately and expensively made; it was a larger case and a larger dial.

Cross-Q. 963. What work did you do on it personally?

[*Same objection.*]

A. I drew the plan of the clock and made the movements and a part of the carving; George Drawbaugh made the case and done the balance of the carving.

Cross-Q. 964. Will you describe generally this clock case and the dial?

[*Same objection*]

A. Its base was, perhaps, three feet, or over, wide, and perhaps the extreme height of the whole case would be from six and a half to seven feet; the width of the case two feet, about; the diameter of the dial would be, perhaps, about twenty-two inches; that is as near as I would judge of the dimensions of it; the dial was made out of brass sheeting, the face of it silvered and was figured; there were glass doors covering the whole body of the case, except the base, and a margin of the sides of the case.

Cross-Q. 965. What was done with this clock after it was completed, and where is it now? Please give its full history.

[*Same objection.*]

A. Mr. Chellis had bought out the clock interest, and it was afterwards moved to his place; and afterwards it was moved to Mr. Jacobs' office; it is still there yet.

Cross-Q. 966. Was it set up and run in your shop, and if so, in what part of your shop and how long?

[*Same objection.*]

A. Yes, sir; it was set up and run some part of the time it was there; it was placed into what we termed the clock room, at the southeast corner of the building.

Cross-Q. 967. Who did the work on the second clock, which was built by the Grissingers?

[*Same objection.*]

A. George Drawbaugh made the case and I made the movements.

Cross-Q. 968. Was the movement made like the clock preceding it?

[*Same objection.*]

A. Yes, sir; about the same; embracing the same principles.

Cross-Q. 969. Were the castings of the mechanism and the base made from the same patterns in the two Grissinger clocks, and from the same patterns that were used in the Johnson Leonard clock?

[*Same objection.*]

A. I don't remember; I think there was a slight change in the patterns—in some portion of the patterns, but what part I don't remember now.

Cross-Q. 970. Was that change made after the first Grissinger clock was built, or before?

[*Same objection.*]

A. That I don't remember; I think it was a short time after they took an interest in the clock; I ain't positive.

Cross-Q. 971. Will you describe the features of the case of the second Grissinger clock?

[*Same objection.*]

A. I will try; I am guessing at the length, you know. It may have been four feet and a half or five feet—the extreme length of the case, about sixteen or eighteen inches in width; a glass door covering the front of the whole case; that is, including the dial and pendulum. I don't remember whether the dial was made of Bristol board or metal, —I think enamelled Bristol board. The case was carved at top, bottom, and sides.

Cross-Q. 972. Were the cases of the two clocks built by the Grissingers, and of the Johnson Leonard clock, made of black walnut?

[*Same objection.*]

A. Yes, sir; the principal part.

Cross-Q. 973. Will you reflect, and state, as nearly as you can, how long it was after the Grissingers took up the business before this second clock was built?

[*Same objection.*]

A. I could hardly state. It was built the first year, I think, for I think they only operated one year, and I don't think that was an entire year that there was any work done.

Cross-Q. 974. Would you say that it was built during the latter part—say the last three months of the year 1878?

[*objection.*]

A. I couldn't say, because I don't recollect. I have no recollection what part of the year.

Cross-Q. 975. What was done with this second Grissinger clock when it was completed?

[*Same objection.*]

A. It was taken to the St. John's church, opposite Shiremanstown.

Cross-Q. 976. Is it there now?

[*Same objection.*]

A. As much as I know. The last time I was at church it was there.

Adjourned until Jan. 20, at ten, A. M.

Jan. 20, 1882, ten, A. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Cross-examination of Daniel Drawbaugh by Mr. Smith continued.

Cross-Q. 977. Dr. John W. Moffitt, a witness heretofore called by Defendants, testifies (on page 521 [499] of Defendants' printed record) that he had one of your clocks in his house, he thinks in 1878, which was put there by the Company with his permission. Which one of the clocks you have described, was this?

[*Same objection.*]

A. That was the one which I described with a large brass dial, silvered. To the best of my recollection, it was the first one made by the Clock Company, or Grissingers.

Cross-Q. 978. What first directed your attention to the invention of a clock run by an earth battery?

[*Same objection.*]

A. I don't know how to answer that. I was experimenting in electrics some; that is, I was experimenting with electro-magnets and permanent magnets; really, my first experiments on that was—I placed an electro-magnet on to a table or bench, and suspended an armature at a point above the poles of the electro-magnet, allowing the armature to hang in front of the poles. I caused a current to pass through the electro-magnet, which would attract the armature; then, by breaking the current, the armature would move away from the poles, and by means of making and breaking the circuit I could keep up a vibration of the armature. Then, at different other times, I further experimented by polarized armatures; that is, short bar magnets, in front of the electro-magnet, making and breaking the circuit in that way, the armature would be attracted and repulsed—finding in that way I could get better results; by the same electro-motive power the armature would move back and forth with more power. I don't remember all the different experiments I then tried, as there was a good many different experiments. I know I had placed the magnets in different positions; that is, the electro-magnets and permanent magnets. Instead of using a bar permanent magnet, I sometimes used permanent magnets in various shapes. I had used a U-shaped permanent magnet, the poles of the permanent magnet suspended above the poles of the electro-magnet, though a little to the right or left of the electro-magnet. By that means I got better results in vibrating the suspended permanent magnet, or, as we may term it, the pendulum. I don't remember what first directed my attention to running a clock by an earth battery; the first thing I did in that direction was placing the plates in a box of earth and wetting the earth; that is, by plates, I mean a positive and negative, a copper and a zinc.

Cross-Q. 979. Had you, before you made the experiments mentioned in your last answer, or before you constructed your first train of gearing to be run by an earth battery, read any account of electric clocks run either by an earth battery or by a battery of any other kind?

[*Same objection.*]

A. I don't think I did. I read, at some period, of electric clocks, but I think that was after my first experiments. I know I wasn't guided by any other work when I made them first pendulums.

Cross-Q. 980. Had you read anything before you constructed the first train of gearing, which you have previously described, to be run by an earth battery?

[*Same objection.*]

A. I don't remember that I did. I know when I was running an experiment of that kind, I generally run the experiments on my own suggestions, because in referring, sometimes I was lead astray in that way. I found, trying these experiments, that at times they would not answer the purpose, and I would not gain any knowledge.

Cross-Q. 981. Have you ascertained the name of the mechanical encyclopedia, published in New York, that you referred to the other morning?

[*Same objection.*]

A. No, sir; I have forgotten to look for it.

Cross-Q. 982. Will you ascertain the name to-night, and also the names of all the other works which you have in your possession on mechanical subjects, or on chemistry, or electricity, or magnetism, and bring them with you to-morrow?

[*Same objection.*]

A. I will, if I don't forget it.

Cross-Q. 983. Do you remember whether the New York encyclopedia contained any articles on electricity and its uses and applications, or on magnetism and its applications and uses?

[*Same objection.*]

A. Yes, sir; it did. I know it did, but to what extent I do not remember. The work was a general mechanical work, not alone on the subject of electricity and magnetism.

Cross-Q. 984. When did you obtain that work?

[*Same objection.*]

A. That I could hardly answer. I don't remember, though it is a good while ago. I don't remember when.

Cross-Q 985. Was it near the time of its publication, or before you moved into your present shop?

[*Same objection.*]

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A. It wasn't near the time of its publication. It was a good while after that, but the period of time I cannot give. I don't remember whether it was before or after I moved into the present shop.

Cross-Q. 986. Where did you get it?

[*Same objection.*]

A. I think I got it from one by the name of Samuel Urich. I am not positive. I think I borrowed the work from Urich. It is not my own work. I know I borrowed the work.

Cross-Q. 987. Do you remember whether there is an article in that work on electric clocks?

[*Same objection.*]

A. Yes, sir; I think there is, but I don't remember reading the article at the time I made my first experiments on the clock. I don't think I had the work at that time.

Cross-Q. 988. Does that article speak of electric clocks run by earth batteries?

[*Same objection.*]

A. Yes, sir.

Cross-Q. 989. Will you ascertain how many pages of that book are devoted to the subject of electricity and its various applications and uses, and of the various titles relating to the application and uses of electricity, and also the number of pages devoted to magnetism and electro-magnetism and their applications and uses, and the titles of the subjects?

[*Same objection.*]

A. I will try. The work is in two volumes. I ain't too sure whether both volumes are in my possession now or not.

Cross-Q. 990. Do you remember whether there were any articles on the subjects of electricity and magnetism and their uses and applications, in the English encyclopedia which you borrowed from Mr. William R. Gorgas?

[*Same objection.*]

A. I don't know, indeed; that work was published in quite a number of volumes; I only had one or two volumes; I ain't positive whether I had one or two; that I had borrowed, more particularly, to study the subject of drawing.

Cross-Q. 991. Have you borrowed other books, which treated the subject of electricity and magnetism, or consulted such books in any libraries to which you have had access?

[*Same objection.*]

A. No, sir; not to the best of my recollection, I have not.

Cross-Q. 992. Did you make an application for a patent, or patents, relating to your electric clock, or to the battery by which it was run? If so, state when you made such applications, and how many of them there were?

[*Same objection.*]

A. I did not make an application alone; the Clock Company furnished the money. There were, an application for an earth battery, and an application for a magnetic clock; I can't state when it was; I think it was in 1878; it was during the time the Clock Company got possession; I think, in the former part of their possession, that the applications were made.

Cross-Q. 993. In the application upon the earth battery did you claim such batteries as your invention, or only some modification of them, and if the latter, what was the feature which you claimed?

[*Same objection.*]

A. The general feature of the claim was this; claiming an earth battery by enclosing or enveloping a copper plate by felt, or may be there were other things in the claim I don't recollect—by felt or its equivalent, or something that way, and enveloping the zinc plate by carbon; the general language of the claim I can't give; I don't remember.

Cross-Q. 994. When did you make that invention?

[*Same objection.*]

A. I couldn't positively give you when I did; I had been experimenting for a long time; I know I had enveloped them plates in different substances that I don't remember, and in cloth and paper, and I know them experiments were at different times.

Cross-Q. 995. How long had you been experimenting with or using felt, at the time of your application?

[*Same objection.*]

A. I couldn't state how long; I don't remember; it may have been a year, or six months, or less, or it may have been more than a year; the length of time I can't give.

Cross-Q. 996. Was there a patent granted on that application?

[*Same objection.*]

A. Yes, sir.

Cross-Q 997. Doesn't the article on electric clocks, in the New York encyclopedia, speak of an earth battery having the plates embedded in coke?

[*Same objection.*]

A. I positively do not know.

Cross-Q. 998. What did you claim as your invention in your application on the magnetic clock?

[*Same objection.*]

A. I can't state all the different claims; there were a great many claims; I might state the general principles claimed; that is, I claimed a magnetic clock, the pendulum being moved or vibrated by the repulsion—I can't word the claim right—of a permanent magnet from the poles of an electro-magnet; I don't know how to express the idea; I can't explain it without a long explanation of my experiments. Another claim was a compensating pendulum, and another was the mechanical construction of the make and break; I don't remember all the claims. Another was on the construction of the movements—some parts of the movements; that is all that I can remember, that I can state now.

Cross-Q. 999. Will you give a history of your experiments, so far as it may be necessary to explain the invention relating to the movement of the pendulum by the repulsion of magnets?

[*Same objection.*]

A. I will try; that was at an early period; I had put up a temporary pendulum made of wood, with a permanent U-shaped magnet attached to the lower end of the pendulum, and an electro-magnet so placed below the permanent magnet, so as the pole of the permanent magnet, when swinging, would pass close to the poles of the electro-magnet. I found, by experimenting, that I could magnetize the permanent magnet by a very feeble current of electricity passing around the cores of the electro-magnet; by causing the pendulum to vibrate by touching it with my hand, keeping up a vibration for a certain length of time. The first few impulses—the number I couldn't state—the pendulum would cease to vibrate, and I knowed that the permanent magnet wasn't sufficiently magnetized, but by continuing to make it with the hand for a sufficient length of time, it would then continue to vibrate by the minute electro-motive power, which was very feeble, I know. After running, or allowing the pendulum to vibrate, a day or two, I would take off the permanent magnet, to ascertain its lifting capacity, or whatever you may style it, by a little balance that I got up temporary out of wood. I would then replace the permanent magnet and take off or disconnect the battery power from the circuit, but I would join the two ends of the coils of the electro-magnet and then start it to vibrate, and found that it would vibrate for a certain length of time, though longer than it would have if I had had no electro-magnet connected. I found in that way that it would run an hour, or sometimes two or three—keep vibrating. The vibrating of the pendulum would get more feeble until it would stop, or nearly so. I then would take off the permanent magnet again, and try its lifting capacity on this balance, and found it a great deal less than before. I thought by that experiment, and think yet, that the power got there was obtained by the saturating or over-saturation of magnetism above a normal state of natural magnetism. It is hard for me to describe or explain it That claim was based on that. There was a claim drawn up to cover that experiment.

Cross-Q. 1000. What was the peculiar feature of your compensating pendulum, and when did you make that particular invention?

[*Same objection.*]

A. It would be hard for me to describe it without making a sketch of it.

[*Witness draws sketch, which is put in evidence and marked* "*Drawbaugh compensating pendulum exhibit.*"]

Recess for dinner until 2, P. M.

Jan. 20, 1882, 2, P. M.

Examination resumed, pursuant to adjournment.

Present same counsel.

Cross-examination of Daniel Drawbaugh by Mr. Smith continued:

[*Mr. Jacobs objects to the sketch and the examination of the witness the subject of the compensating pendulum, or the peculiar construction of witness' magnetic clock, on the ground that an application is pending for letters*

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patent therefor, at the present time, in the United States Patent Office, and that witness is not bound to divulge any part of his invention until the same shall have been patented.]

(*Witness continues.*) AA are two brass rods permanently fastened to an upper cross-bar C by pins through bar and rods; BB are two steel rods, also fastened in upper cross-bar and in lower cross-bar D; FF are two metal levers secured to lower cross-bar D by screws or rivets, it is not particular which. The lower ends of brass rods A rest upon the levers FF, towards the outer ends.

Another short steel rod E, the lower end of which is secured to pendulum ball G.

At a short distance above upper edge of pendulum ball G is a pin I, secured to steel rod E, which said pin rests upon the inner ends of levers FF.

HH are two metal screws, passing through and riveted, but all but allowed to turn at the inner ends to small projections.

Said screws are threaded and fitting a screw thread on a projection at the lower end of brass rod A for the purpose of adjusting lower end of brass rods inwards or outwards on the lever ends FF.

The expansion of the rods AA, acting upon the levers FF, counteracts the expansions of steel rods BB.

It may have been invented as early as 1874, or it may have been as late as 1876, to the best of my recollection, as I have no distinct recollection when I first made it.

Cross-Q. 1001. Upon which of the clocks which you have described was this pendulum placed?

[*Objected to by Mr. Hill as immaterial and irrelevant, and as new matter not referred to in the examination-in-chief.*]

A. Upon the clock that Johnson Leonard had, and the one that is now in Mr. Jacobs' office, and upon the clock which is now in St. John's church, a brick church opposite Shiremanstown.

Cross-Q. 1002. Has any patent been allowed and issued on your application on the clock?

[*Same objection.*]

A. Yes, sir; so I am informed—one has been allowed but not issued.

Cross-Q. 1003. What other electrical inventions or apparatus besides what you have heretofore described have you made, or invented, or experimented upon since you moved into the shop you now occupy, and before the commencement of this suit?

[*Same objection.*]

A. I have been working on a good many things. I don't know whether I can think of all. I experimented and made an apparatus for signaling and telegraphing. I termed it a magneto-electric telegraph, and another, which I termed an alphabetical telegraph, a magneto-electric machine also; and I also experimented a good deal on electro-magnets and permanent magnets, but them experiments related more on the telephone than on other apparatus. That is all that I can think of.

Cross-Q. 1004. Some of the witnesses who had been called for the Defendants have spoken of an electric fire alarm. Did you invent and make an apparatus of that kind during the period specified?

[*Same objection.*]

A. Yes, sir; I used one of those magneto signalling bells, and secured it to the upper part of the wall of the shop, towards the ceiling. There was another portion, then, composed of a strip of wood, or the pith of wood, cemented or fastened to the side of a piece of thin metal, which was intended to be placed on the ceiling of a room. To the metal was secured a wire, which was connected to one pole of a battery.

At the opposite end of the metal and wood there was a bracket secured to a small base. There was a wire attached to that, which was attached to the opposite pole of the battery.

A temperature of about between 90 and 120 degrees of heat would cause a junction of the metal and wood bar to come in contact with the bracket, which was secured to the small base, which would then form an electric circuit through the alarm bell, which was before mentioned.

Cross-Q. 1005. When did you construct this apparatus, and how long was it set up and exhibited in your shop, if it was exhibited?

[*Same objection.*]

A. I could hardly say when—1872 or 1873, or perhaps as late as 1874, or perhaps later. I could hardly say exactly. It might have been there a year or two, but not a battery connected with it all that time. There is a portion remains yet at the shop.

Cross-Q. 1006. Where were the different parts placed?

[*Same objection.*]

A. In a room—the wood department. To exhibit it, though, I had

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taken it from the ceiling and laid it in the neighborhood of the stove, to show the working of it, and I might have had that portion of it in different other rooms.

Cross-Q. 1007. Did you, after you moved into the shop, construct one or more galvanometers, and if so, how many, and when did you construct them?

[*Same objection.*]

A. Yes, sir; I constructed two, I think, while I was in that shop, and one before I went to that shop. I can't exactly tell when. I will get at it as near as I can. It may have been as early as 1872, or as late as 1877, though the first one of the two I constructed a year or two before I constructed the last one. A year or two intervened between them, maybe three years.

Cross-Q. 1008. Did you invent these instruments, or did you construct them from descriptions which you found in works on electricity?

[*Same objection.*]

A. I did not invent the first one. The second, I improved to some extent; and the third one I still improved more. I got them up for my own use, for my electrical experiments.

Cross-Q. 1009. Did you construct the one you made before you went to that shop from a description which you found in some work on electricity, or did you copy it from some instrument of which you had knowledge?

[*Same objection.*]

A. I don't now know where I got my knowledge from for the construction of it. At that day I didn't have many scientific books. I had one or two old school philosophies. It might have been, perhaps, that I seen a description of it in them.

Cross-Q. 1010. How long did you keep that instrument?

[*Same objection.*]

A. I have got it yet—part of it.

Cross-Q. 1011. Will you describe the instrument, either by words or by a diagram, whichever is the easiest for you?

[*Same objection.*]

A. I will make a sketch.

[*Witness draws sketch, which is put in evidence and marked* "*First galvanometer diagram,*" *figures* 1 *and* 2.]

Figure 1 is a side view, and figure 2 is a top view. A represents a base board; B a coil of insulated wire; C a needle; D a cord suspending the needle; E a metal rod for supporting the suspended needle. The longest diameter of the coil might have been three inches, and the needle was two inches, or, perhaps, two and a half long. According to my judgment, there may have been between 40 and 60 turns in the coil. The wire may have been between 26 and 30, I don't know. The needle was suspended from the arm, and had no support below it.

Adjourned until January 21, 1882, at ten, A. M.

January 21, 1882, 11.15, A. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Cross-examination of Daniel Drawbaugh by Mr. Smith continued:

Cross-Q. 1012. Will you state generally how the two galvanometers, which you built after the first one, differed from the first one, either in size or plan of construction?

[*Same objection.*]

A. The only difference in the plan of construction of the second is that there was two needles—a needle placed at the top of the coil—and the instrument was encased. The size of the coil was about the same, to the best of my recollection. The third galvanometer was composed of a coil somewhat similar to the others, though of much thinner wire. The gauge of the wire I don't remember. The opening of the coil was somewhat larger, and in that were placed two needles, oppositely polarized; that is, the poles standing in opposite directions; a needle underneath the coil and one at the top of the coil, besides the two inside of the coil, I think. The needles that were placed between the coil were much larger, and magnetized so as to counteract the attraction north and south, only allowing a small attraction north and south. This third galvanometer was also placed in a casing. That is as near as I can describe it.

Cross-Q. 1013. Were the two needles of the second instrument and the four needles of the third, supported by one support, so as to vibrate together?

[*Same objection.*]

A. Yes, sir; a small support.

Cross-Q. 1014. Were they suspended by a cord, as in the first instrument, or did they rest upon a bearing below the needles?

[*Same objection.*]

A. They were suspended on a thin fibre of silk; that is, the two last galvanometers.

Cross-Q. 1015. Before you constructed these last two instruments, had you seen descriptions of galvanometers provided with multiple needles, similar to those your galvanometers had?

[*Same objection.*]

A. I may have, before constructing the second one of the three. I think I had seen it stated somewhere of two needles.

Cross-Q. 1016. Were these galvanometers provided with dials, by which the amount of deflection of the needles could be observed?

[*Same objection.*]

A. Yes, sir; the last two were.

Cross-Q. 1017. Have you ascertained the name of the New York encyclopedia as requested yesterday, and taken a list of the other works which you have in your possession on mechanical subjects, and on chemistry, electricity, and magnetism? If so, please state what you have learned.

A. Yes, sir; I have. "Cyclopedia of Useful Arts," two volumes, by Charles Tomlinson, and to get at the date of it I will have to read a little more of the title: "An Introductory Essay on the Great Exhibition of the Works of Industry of all Nations, 1851." This is the work which I referred to as the encyclopedia in my possession, and is the one I borrowed from Urich. I looked in the work this morning to ascertain the number of pages on electricity and electro-magnetism. The number of pages on electricity is fourteen; the number of pages on the electric telegraph is eight; the number of pages on electro-metallurgy is eleven; on electro-motive machines, five pages; pages on magnetism, three and a half,—only on earth magnetism and the dipping of the needle, it just refers.

Then I looked up some other books: "A Practical Manual of the Collodium Process," by S. D. Humphery, of New York, 1857; "The Photograph Manual," by N. G. Burgess, 1859; "Class Book of Chemistry," by Edward Youman, 1851; "Parker's Philosophy," revised edition, 1855. It has my name on the first blank leaf, and date of purchase, 1856; "Natural Philosophy," by J. L. Comstock, 1848. On the front fly-leaf my name is written, dated 1852. There are a few other works that I got lately—within a few weeks past: "Deschanel's Natural Philosophy," by Professor Everett, 1878; "Elementary Lessons in Electricity and Magnetism," 1881. The last book I got only two or three days ago.

Cross-Q. 1018. What was the apparatus which you referred to in your answer to the 1003d interrogatory, in these words: "I experimented and made an apparatus for signalling and telegraphing. I termed it a magneto-electric telegraph." What uses was it designed for?

[*Objected to by Mr. Hill as irrelevant and immaterial, and as new matter not referred to in the examination-in-chief.*]

A. It was designed for signalling and telegraphing. It was an electric apparatus. I couldn't describe it, unless I would make a drawing of it; it is so hard, and there are so many parts, that I couldn't.

Cross-Q. 1019. Do you mean, by telegraphing, that it was to do the same work as the ordinary Morse telegraph, and other known telegraph instruments?

[*Same objection.*]

A. Yes, sir.

Cross-Q. 1020. What do you mean by signalling—is that something different from what is ordinarily known as telegraphing, and if so, what was it?

[*Same objection.*]

A. I had used it with signal bells attached to the instrument.

Cross-Q. 1021. Where had you used it in that way—where was the apparatus placed, and where were the bells placed, and how many of them were there?

[*Same objection.*]

A. They were in different parts of the shop; that is, I changed them to different places; I could not state accurately. I had the bells also in my house, at times.

Cross-Q. 1022. Do you mean that you had the signalling apparatus in your shop, connected with bells for receiving the signals at your house, so that you could send signals from your shop to your house?

[*Same objection.*]

A. No, sir; I never had it attached in that way—not to the best of my recollection.

Cross-Q. 1023. When you had the bells in your house, at times, with what were they connected?

[*Same objection.*]

A. With the signalling apparatus; you might term it a magneto transmitter. I could not answer in no other way. That was also in my house, but connected to a short line.

Cross-Q. 1024. In what part of the house was the transmitter, and where were the bells placed, and was the short line wholly within your house, or did it go outside of your house?

[*Same objection.*]

A. The one instrument would be in one room, and the receiver, I suppose, would be in the next room, or two rooms; the line would be within the house. That I would do in the evenings, after leaving my shop, for the purpose of experimenting.

Cross-Q. 1025. When there were two or more bells, were they connected to the transmitter by one common circuit, or by different circuits?

[*Same objection.*]

A. To describe that, it will be necessary to give you some little experiments on that.

There were different plans that I was experimenting on. The transmitting instrument was provided with a number of push-buttons, or keys; the number I don't remember—eight or ten. In one plan that I was experimenting on, there were a number of bells placed on the same line; the various bells, that is, the electro-magnets of the various bells, were of different resistance, I may say.

The armature of the transmitter could be controlled, so that it would ring a bell of high resistance, or of a resistance to correspond. I mean, with the distance of movement of the armature. By that means I could signal one bell, and not any other bells on the same line. The idea of that was to be used on longer lines; for short lines I would use one main wire, that would attach to one pole of the receiver, and the pole that would correspond on the transmitter; and another wire connected with the main wire for each bell, from a push button, up to the number that would be desired to use. That is as near as I can give the idea; I think that is all right.

Recess for dinner until 2 o'clock, P. M.

January 21, 1882, 2, P. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Cross-examination of Daniel Drawbaugh by Mr. Smith continued:

Cross-Q. 1026. The office of the push buttons, I suppose, was to close the circuit, when you desired to ring the bell in that branch, and that there were as many different bells as there were push buttons?

[*Same objection.*]

A. Yes, sir; but I never had as many bells attached to it as there was push buttons; the highest number of bells that I had, I think, was three, but it would have operated as many bells as there was push buttons.

Cross-Q. 1027. What was the size of those bells?

[*Same objection.*]

A. Some of them,—that is, two of them, I think,—were three inches, or three and a half, in diameter; and another bell that I used, was about five or six inches in diameter, as near as I can recollect.

Cross-Q. 1028. The hammers of these bells, I suppose, were connected to the armature of the electro-magnet at each bell, so as to be operated by the magnetizing and demagnetizing of the cores of the electro-magnets?

[*Same objection.*]

A. Yes, sir; only there was a little difference of construction in some of them; that is, the hammers were attached to a rod that was connected to the armatures, in some of them; in some there was a little difference in that respect.

Cross-Q. 1029. Was it necessary to have a difference of resistance of the coils of the electro-magnets of the different bells, when they were in separate branch circuits, which were to be closed by a push button, when the bell was to be rung?

[*Same objection.*]

A. No, sir; not in different circuits.

Cross-Q. 1030. When the bells were in the same circuit, the push buttons, I suppose, were not required?

[*Same objection.*]

A. No, sir; but they could have been used.

Cross-Q. 1031. The difference of resistance in the different coils, when the bells were in one circuit, was obtained by winding a greater or less number of turns upon the coils?

[*Same objection.*]

A. Yes, sir; by that, and then again, by the difference in the number of the wire; and also by putting into the line any manner of resistance, which there would be a good many different ways of resistance.

Cross-Q. 1032. I suppose the object of having a different resistance in the coils was to give a different degree of magnetization to the cores, through the same current, so that the armature of one electro-magnet might be made to move and ring its bell, while the armatures of the other electro-magnets remained stationary?

[*Same objection.*]

A. Yes, sir; not alone the resistance in the coil, but the resistance in the line also.

Cross-Q. 1033. And the ringing of the different bells was to be effected by sending currents of different strength corresponding to the bell you wanted to ring?

[*Same objection.*]

A. Yes, sir.

Cross-Q. 1034. Will you describe the manner in which the current was generated in this apparatus; and the manner in which you secured difference of strength to correspond to the different bells, making a diagram if you choose, to illustrate it?

[*Same objection.*]

A. I will try and answer without making a diagram.

The portion of the instrument, which we will term the transmitter, was composed of a permanent compound magnet, secured underneath a base made for that purpose, resting horizontally.

There was an electro-magnet secured to the base.

The electro-magnet was held, or placed at right angles with the permanent magnet, or vertically above it. The poles of the core of the electro-magnets were about a quarter of an inch above the sides of the poles of the permanent magnet. Said cores were hollow, about half an inch in diameter, as near as I can remember.

At the end of the cores, next the poles of the permanent magnet, were placed short cores of steel. Each of them were attached by a brass rod for each core.

Said rods passed up through the center of the core of the electro-magnet, and were attached to an armature, which was placed movable above the upper ends of the cores of the electro-magnet. One of those brass rods was attached to each end of the armature.

In the center of the armature was attached a metal bracket, for the purpose of holding one end of a lever. At the opposite end of the lever was a button, for the purpose of operating said lever. More strictly speaking, that button was attached to an adjusting screw. The adjusting screw passed through the opposite end of the lever. On the side of the frame of the transmitter were a number of push buttons. The number I now forget. On the opposite of this apparatus were the same number of screw-cups. There was an arrangement that I didn't have any name for—a slide with steps on it, which would slide under the lower end of the set or adjusting screw, which would limit the movement of the lever, and also would cause strength of current corresponding with the resistance required for the different bells.

Cross-Q. 1035. Will you give the size of the permanent magnet, and the number of leaves in it, and the dimensions of the electro-magnet and its coils?

[*Same objection.*]

A. The size of the permanent magnet may have been eight or ten inches long. It was a horse-shoe magnet. The number of leaves I don't remember—perhaps five or six in number.

The length of the electro-magnets—in the neighborhood of two inches, as near as I can remember. Diameter of the coils, an inch and a quarter or an inch and a half, as near as I can remember.

Cross-Q. 1036. Were the short cores of steel, which you mentioned, placed between the lower ends of the cores of the electro-magnet and the face of the permanent magnet, and were they connected with the armature above the electro-magnet so as to be moved with it?

[*Same objection.*]

A. The diameter of the steel cores corresponded with the inside diameter of the hollow cores. They were allowed to move in the hollow cores and were attached to the brass rods. The brass rods were attached to the armature.

When the armature rested on the upper end of the electro-magnet cores, the steel core rested on the face of the permanent magnet. That would answer your question. The steel cores were in length between five-eighths and an inch. I don't remember exactly.

Cross-Q. 1037. Was the armature lever, when the instrument was used, operated with the hand directly, or through any other mechanism?

[*Same objection.*]

A. By the hand.

Cross-Q. 1038. Now, if I understand this apparatus, the differences in the strength of the current, to correspond with different bells, was secured by the difference in the range of movement of the lever and the armature?

[*Same objection.*]

A. Yes, sir; the further the armature moved from the permanent magnet the greater would be the strength of the current. I am sure of that.

Cross-Q. 1039. What provision, if any, did you have for preventing the bell requiring the weakest current to ring it, from ringing when a stronger current was sent through it?

[*Same objection.*]

A. The armature of the one was retarded by a spring, you know, that a certain current—that the one current wouldn't be sufficient to move the armature. I can't hardly give you the right language. I know that I had worked them in that way. I had a mechanism, and I know I rung them; and it is so long that I almost forget it; but I will get that, for I did it.

Cross-Q. 1040. You spoke of one arrangement with a series of bells on one circuit, to be used on long distances; and another arrangement with bells on branch circuits, to be used for short distances. For what different purposes did you design to use these two arrangements? What did you mean by long circuits and what by short circuits?

[*Same objection.*]

A. On long circuits, the idea was of using resistance, so that you would not have to use so many wires, but I never used it on a long circuit.

I had no particular purpose. You could use it for different purposes. My idea of the short circuits was that it could be used in a business office to signal different apartments in a manufactory or hotel, or whatever place it might be applied.

Cross-Q. 1041. When did you construct this apparatus, and how long did you experiment with it?

[*Same objection.*]

A. It would be hard for me to say when I constructed it. I will give myself plenty of room—between 1871 and 1874. That is coming pretty near it. I worked at it, I suppose, at different times, and might have experimented with it a year or more. I was not at it constantly—certainly not.

Adjourned until Jan. 23, 1882, at ten, A. M.

Jan. 23, 1882, *ten,* A. M.

Adjourned until Jan. 24, 1882, at ten, A. M., on account of the illness of Daniel Drawbaugh.

Jan. 24, 1882, *ten,* A. M.

Adjourned until January 25, 1882, at ten, A. M., for the same reason.

Jan. 25, 1882, *ten,* A. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Cross-examination of Daniel Drawbaugh by Mr. Smith continued:

Cross-Q. 1042. Did you, in the course of your experiments, have a magneto-telegraph, or signalling transmitter, in a different form from that which you have last described?

[*Same objection.*]

A. Yes, there was modifications and changes on the instrument.

Cross-Q. 1043. Can you state generally what those modifications were?

[*Same objection.*]

A. I guess I could.

Cross-Q. 1044. Will you go on and describe them generally?

[*Same objection.*]

A. I don't know whether I could describe them all, because it is so long back. At one period, I had the electro-magnet stationary, and the poles were not hollow, and the permanent magnet was secured to the base, being pivoted, and the back end of the magnet having a press-button which would, by pressing on it, make a rupture between the permanent magnet and the poles of the electric-magnet. I don't remember distinctly whether, after the modification, I used all these parts. After making these modifications, I did not use the natural magnet, which had been on the original instrument. I made a new permanent magnet.

Cross-Q. 1045, Won't you describe the size and shape of the permanent magnet that you used in the modification you have last spoken of?

[*Same objection.*]

A. I think it was described in a former question. That permanent magnet which is the new one, is the one I have already described.

Cross-Q. 1046. If I understand you, the instrument which had the plunging core was the second modification, the last one you have described being the first one?

[*Same objection.*]

A. Yes, sir; but the length of time between—I don't know how long, but it was but a short time.

Cross-Q. 1047. What was the size and shape of the first permanent magnet?

[*Same objection.*]

A. It was horse-shoe shaped. The length of it, between four and six inches. There may have been five, six, or seven, or, perhaps, eight leaves. It was a compound magnet.

Cross-Q. 1048. And did you use the same coils in both forms of the apparatus for the electro-magnet?

[*Same objection.*]

A. I think I did, at first.

Cross-Q. 1049. Do you remember any other of the forms in which you put this apparatus?

[*Same objection.*]

A. There were other forms, but I don't remember them now. I remember of having a compound switch. The intention of that switch was to switch the current on the line in opposite directions.

Cross-Q. 1050. What provision did you have, when using these transmitters to ring bells, for preventing a bell requiring a weaker current being run when a stronger current was sent through?

[*Same objection.*]

A. I had a plan of ringing—I think it was three bells. I have been thinking of it since, but I don't remember how I did it; I may have used my compound switch; by that I could ring two bells of the same resistance, or even one bell of less resistance. I don't remember in what way I did it.

Cross-Q. 1051. Did you use these transmitters, which you have described, for telegraphing, as distinguished from signalling by means of the bells?

[*Same objection.*]

A. I don't exactly understand that question. You could place a receiver—a sounder—the sounder would have to be fitted with a polarized armature, as an ordinary sounder wouldn't operate—in place of a bell; you could have used the transmitters with such an apparatus, but I didn't.

Cross-Q. 1052. Did you ever make a trial of these transmitters on a telegraph line for telegraphing?

[*Same objection.*]

A. Never,—no more than what short lines I made myself.

Cross-Q. 1053. Did you ever make a trial of any telegraph apparatus, of your own construction, upon a telegraph line?

[*Same objection.*]

A. I did, yes; no one knows it but myself. I tried a polarized armature on a line that runs by White Hill, one night; I placed a plate on to the damp ground, and attached it to the sounder, which was a polarized armature sounder; there was another wire, with a small stone attached to one end of it, which I threw over the line, to find out whether I could work with more power, or whether it would work with less adjustment of the sounder; I found it would work, provided I had the right poles attached; I found it was operative, but I could not read the signals, as I never studied telegraphing. That is the only line.

Cross-Q. 1054. What transmitter did you use in this trial?

[*Same objection.*]

A. No transmitter.

Cross-Q. 1055. Some of the witnesses have spoken of a dial instrument which you had; what is the general character of that instrument?

[*Same objection.*]

A. That is a little complicated; it will be a little hard for me to describe, unless I make a sketch of it. The transmitter was composed of a permanent magnet; and on the poles of the permanent magnet was placed an electro-magnet; these were placed into a case or box; in said case was a frame or reel; on that reel were placed half as many polarized armatures as there was letters of the alphabet; on the outside of the case there was a dial and an indicator, which would be the crank of the reel.

That represents the transmitting part. The receiving instrument was composed of parts about as follows. A train of gearing or clock work; the last wheel was an escapement wheel, the journal of which carried the pointer moving around the dial; there was a coiled spring in the train, that would wind up similar to a clock.

A little ways from the edge of the escapement wheel was placed a lever, which supported or carried a verge; said verge rested against the edge or teeth of said escapement wheel; at one end of the lever was attached a polarized armature, which was operated by an electro-magnet; causing a current to pass around the cores of the electro-magnet, would cause the armature to move towards, or away from, the poles, according to the direction of the current sent through it. When the armature moves, that allows the escapement to move the space of half a tooth, and then the other end of the verge catches it; when the armature moves in the other direction, the escapement wheel again moves the space of half a tooth; and then again the opposite end of the verge catches another tooth, and stops the escapement wheel.

The machine worked by magneto currents and not by voltaic currents.

Cross-Q. 1056. This receiver, if I understand it, required one impulse of electricity to be sent through it for each movement of the escapement wheel, did it not; and each movement of the escapement wheel carried the pointer of the dial from one letter to the next?

[*Same objection.*]

A. Yes, sir.

Cross-Q. 1057. The instrument is what belongs to the class known as "step by step" instruments, is it not?

[*Same objection.*]

A. I don't know what it might be termed.

Cross-Q. 1058. Was this receiver placed in a case by itself, or in the same case with the transmitter?

[*Same objection.*]

A. It was in a case by itself, but the two could have been placed in the same case.

Cross-Q. 1059. How large were the dials of the transmitter and receiver, and how large the cases which held them?

[*Same objection.*]

A. I give that to the best of my recollection. The dials of the transmitter and receiver were both about of one size, which would be about six or seven, or maybe eight inches in diameter. The cases were a little larger, but not much larger, either; they were round.

Cross-Q. 1060. Where in your shop did you have these instruments placed?

[*Same objection.*]

A. At different places. Sometimes I would have the transmitter in that small room at the north corner of the shop, and the receiver in some other portion of the shop. Sometimes transmitter and receiver would both be in the same room. At other times I would have the instruments in the wood-working part of the shop. They may have been in other portions of the shop that I don't remember now.

Cross-Q. 1061. How did you operate those instruments in sending messages?

[*Same objection.*]

A. By moving the transmitter pointer to a certain letter on the dial, which would cause an impulse of magneto electricity to pass over the wire, which would cause the receiver to move the space of one twenty-sixth of a revolution.

Cross-Q. 1062. If I understand the transmitting apparatus, the current was generated in the coil of the electro-magnet by passing the permanent magnets on the reel, by the poles of the electro-magnet. Is that so?

[*Same objection.*]

A. The currents were generated by one of the polarized armatures coming in contact with the poles of the electro-magnet; that would cause a current in one direction. The same armature passing away from the poles would cause a current in the opposite direction. A soft iron armature would answer the same purpose; that is, I had it in both ways. They would come very close to the poles, but not in actual contact, as that would make the instrument work too hard.

Cross-Q. 1063. In using this apparatus, when you desired to indicate any particular letter, did you carry the indicator of the transmitter from the position it would occupy, to the letter you desired to indicate, at a single movement, or did you stop at each intervening letter?

[*Same objection.*]

A. I think you had to go in one direction; I think to the right. The dial was marked in what direction you should move the indicator. You moved the indicator right to the letter you wished, and then stopped a short time, and then moved it to another letter, until you had finished the word.

Cross-Q. 1064. What was the size of the permanent magnet, and the electro-magnet upon its poles, and what were the sizes of the polarized armatures on the reel?

[*Same objection.*]

A. The size of the permanent magnet was—it was the magnet I had used in one of the modifications of the instrument I described before—about four or five inches long. The electro-magnet had coils about an inch and a half or an inch and three quarters long, as near as I can remember. The diameter of the coils was about an inch and an eighth or an inch and a quarter. The polarized armatures on the reel were about an inch and three quarters, or perhaps two inches long, as near as I can remember.

Cross-Q. 1065. When did you construct this apparatus, and during how long a period were you experimenting with it?

[*Same objection.*]

A. I don't remember when, and the length of time I was experimenting I don't remember.

Cross-Q. 1066. State, as near as you can, when you constructed it, and who occupied the shop at the time you constructed it?

[*Same objection.*]

A. It was made and I had it, I know, before the Axle Company came there, but I don't know how long before that; I can't think of any circumstance to fix the time nearer than that.

Cross-Q. 1067. Was it constructed after you made the transmitting apparatus for signalling, which you have previously described?

[*Same objection.*]

A. Yes, sir.

Cross-Q. 1068. Did you ever try it on a telegraph line?

[*Same objection.*]

A. No, sir; no more than in my own place or shop.

Cross-Q. 1069. Were these instruments that you have described all the instruments which you made for telegraphing or signalling?

[*Same objection.*]

A. Yes, sir; I think so, to the best of my recollection.

Cross-Q. 1070. Mr. John Weber, a witness who has testified for Defendants, testified on page 256 [245] of the printed record, that you said to him on one occasion: "'I have invented a great many machines, such as telegraph'—then showed me that he could telegraph by writing on a silver paper—tin paper—and put that to the wire, and it would write the same at the other end." What apparatus was that?

[*Same objection.*]

A. I had forgotten that I had a temporary apparatus, which I never had quite completed, worked or attached, to a wooden pendulum suspended, with an electro-magnet at the bottom of the pendulum, carrying a lever with a pencil or a marking instrument. But I only had put up the one. It would require two of those instruments to send and receive. I didn't have that long; the reason I abandoned it, it would be hard to regulate two pendulums at two stations, to vibrate the same number in a given time. I had made drawings of a complete machine, that is, a rough drawing, which I thought I could get over that difficulty, but never made the machine.

Cross-Q. 1071. When did you make these drawings and construct the instrument, as far as it was constructed?

[*Same objection.*]

A. I had put up that pendulum before I made the drawings, and the time I did it I don't remember; indeed I don't; it was before the Axle Company started there, and was while the old Faucet Company was there, I should suppose; I don't remember.

Cross-Q. 1072. Had you, before you constructed that apparatus, ever seen any account or description of an apparatus working on that principle?

[*Same objection.*]

A. No, sir; I did not; but I did after that.

Cross-Q. 1073. Where did you see it after that?

[*Same objection.*]

A. I don't remember whether I seen it in any publication, or whether some person told me.

Cross-Q. 1074. Was the dial apparatus your own invention--made without any knowledge of any similar apparatus?

[*Same objection.*]

A. Yes, sir; when I made that I had never heard of anything, I am positive. I mean anything of the kind.

Cross-Q. 1075. When you made your signaling apparatus, had you ever heard of any magneto apparatus for transmitting?

[*Same objection.*]

A. I never did before I made that.

Cross-Q. 1076. Mr. H. B. Musser, one of Defendant's witnesses, on page 333, [319,] of the printed record, says that at the time he was at your shop, you were making a belt, which you called an electric-belt. What sort of an apparatus was that, and when did you make it?

[*Same objection.*]

A. I can't tell when I made it. I made that for a daughter of mine to wear. I suppose I made it at the time he said. It was a number of years ago.

Cross-Q. 1077. Which daughter did you make it for?

[*Same objection.*]

A. Laura.

Cross-Q. 1078. Was that your own invention also?

[*Same objection.*]

A. No, sir; but I still made it different from most others, for the most of these belts have the two metals laid in contact, which I don't think is the proper way.

In wearing this belt, the way it was constructed, the plates were insulated one from the other, the copper from the zinc. Before wearing, which was to be done occasionally,—every evening or so,—there was an outside sheath, which would be made damp, and the belt placed into that.

Cross Q. 1079. Did you ever construct an electrical apparatus for signs?

[*Same objection.*]

A. Not that I can remember of now,—for signs.

Cross-Q. 1080. Did you ever give any attention to the subject of electric light?

[*Same objection.*]

A. No, sir.

Cross-Q. 1081. Did you ever give any attention to the subject of electrical machines for generating electricity, such as were used for the electric light?

[*Same objection.*]

A. No, sir.

Cross-Q. 1082. Did you ever employ any one to look up the subject of Brush's patents relating to the electric light?

[*Same objection.*]

A. Not to the best of my recollection.

Cross-Q. 1083. Did you ever consult Mr. Theophilus Weaver, of this city, in relation to any invention of yours, relating to vibrating signs operated by electricity, or in relation to the Brush patents on electric light apparatus?

[*Same objection.*]

A. I do not remember. He drawed up specifications for me on other inventions, and I often asked him to make search for me on different inventions, but I don't now remember what.

Cross-Q. 1084. What inventions did he draw specifications for: for you?

[*Same objection.*]

A. For the magnetic clock and a measuring faucet. That is all that I can remember now.

Cross-Q. 1085. Did you invent, at one time, a solar transit?

[*Same objection.*]

A. No, sir; I did not invent a solar transit. I constructed a rude arrangement from some old camera lenses, that I had there.

Cross-Q. 1086. When was that, and for what purpose did you construct it, and what use did you make out of it?

[*Same objection.*]

A. The time that I constructed it I don't remember. I had used it at the time I was making one of those magnetic clocks, to regulate or test the clock as to proper time keeping.

Cross-Q. 1087. Which one of the clocks?

[*Same objection.*]

A. I don't remember which one. It was one of the earlier made clocks. It was before I made the clock Mr. Leonard had.

Cross-Q. 1088. Did you ever see or hear anything about Edison's phonograph?

[*Same objection.*]

A. Yes, sir.

Cross-Q. 1089. When was that?

[*Same objection.*]

A. I couldn't tell you the year. It was, I think, during the time the Grissingers were in the shop.

Cross-Q. 1090. If you saw it, where did you see it?

[*Same objection.*]

A. I don't know that I ever seen the instrument. Yes, I seen one exhibited in a show, I think, in the summer of 1881. I meant by my previous answer, that I had heard of the instrument at an earlier time.

I saw the one referred to in a side show of a circus, here in Harrisburg, while we were taking testimony here last summer.

Since reflecting, I won't be too positive whether it was last summer, or the summer before, but I think it was the summer of 1881. I don't wish to be too positive.

Cross-Q. 1091. Did you ever construct one of your own invention. If so, when did you commence your experiments upon it, and when did you complete the instrument?

[*Same objection.*]

A. I constructed one. The time I don't remember, but it was at a pretty early time; though when I constructed that, I didn't make it a speaking phonograph. The first experiment I made, I used the old instrument "C." It was fit on the bed of an old turning lathe, which was truly planed off. Between that I put plaster-of-paris, and when the plaster-of-paris was of proper consistency, I scraped it off level with the bed.

At the bottom of the diaphragm of the instrument, was a pin that would just come in contact with the plaster surface, and I would make sounds—musical tones, and move the instrument while I was making the sounds.

After the plaster was dry, I would move that over in the same direction, and I found that it produced musical tones, which would be the same as the original, only faint.

The idea of that experiment was, to apply it to a clock, to denote the hour of the day by a few bars of music, adopting familiar tunes; but while experimenting, I found that it wouldn't be practical—it wouldn't be loud enough.

Them experiments, I know, were before I had ever heard of Edison's machine; I am positive of that. There are persons I know who have seen that at a middling early time.

By "between that" I mean between the slides of the bed of the lathe, on a board placed there for the purpose.

There was a certain consistency of the plaster, that was just right for that pin to work in; if it was too hard it would spawl off, and if too soft it would indent or come up at the sides.

Cross-Q. 1092. You say it was in a pretty early time; what do you mean by that?

[*Same objection.*]

A. I think it was during the former part of the Axle Company's operations there; I don't want to be too positive.

Cross-Q. 1093. Have you stated all that you did in relation to that invention?

[*Same objection.*]

A. Yes, sir; with the exception that I had used the plaster in a little different way. There was a little cylinder made of plaster-of-paris; the intention of that was to receive the musical tone of the different hours, and to be placed in a clock; but I had never put it into a clock; I thought it wasn't sufficiently loud.

Cross-Q. 1094. When did you make this last modification?

[*Same objection.*]

A. That was about the time that I had made the other, or a short time after that.

Cross-Q. 1095. Into what was this cylinder covered with plaster, fitted?

[*Same objection.*]

A. Into a little frame, for the intention of putting it into a clock.

Cross-Q. 1096. Who were the parties who saw this apparatus in either of its forms?

[*Same objection.*]

A. I don't remember who they were—different ones. But the most of my experiments on that were at night; I didn't show it to every one. I remember one person that seen it—a boy—one evening,—Mr. Jacob Fry. There were other persons that seen it, but I don't remember who they were. I abandoned it and didn't think much about it since.

Cross-Q. 1097. When you were using the signal bells in connection with your magneto transmitting apparatus, were they placed in different parts of the shop exposed to view or were they enclosed in any way?

[*Same objection.*]

A. They were not enclosed; they were just set on to a bench part of the time; sometimes when parties wanted to see them, I would just set them down, connect them and operate them.

Cross-Q. 1098. Were they fixed on a common base or frame of any kind, so that you could move them all together?

[*Same objection.*]

A. Yes, sir.

Recess for dinner until 2 o'clock, P. M.

Jan. 25, 1882, 2, P. M.

Examination resumed, pursuant to adjournment.

Present same counsel.

Cross-examination of Daniel Drawbaugh by Mr. Smith continued:

Cross-Q. 1099. Several of the witnesses have referred to a machine, which you had in your shop, for wrapping wire, as they termed it, was that a machine of your own construction; if so, when did you construct it?

[*Same objection.*]

A. Yes, sir; it was of my own construction. Part of the apparatus I constructed, I guess, before I went down to the shop I am in now; I can't tell you when I finished it; I applied a part to it—a treadle; the former part you run by hand; it might have been 1870, or perhaps earlier, or perhaps later, that I made the change.

Cross-Q. 1100. Did you construct a machine for cutting gears, in connection with your work on clocks, or in connection with any other work?

[*Same objection.*]

A. Yes, sir.

Cross-Q. 1101. When was that?

[*Same objection.*]

A. After I moved from Mechanicsburg. To the best of my recollection, it was about that time. But before I made that machine, I had one that I borrowed from Mr. Shapley; one they termed a wheel engine.

Cross-Q. 1102. Which of those machines did you use in cutting the gears on the Johnson Leonard clock?

[*Same objection.*]

A. I don't remember distinctly, but I think I used the one I made myself.

Cross-Q. 1103. In speaking of the first train of clock mechanism, which you made, and I think also, of the second, you said part of the gears were cut by hand. Did you cut the other part of the gears yourself, or use parts out of a clock that had been previously cut?

[*Same objection.*]

A. I used it in a former clock. I cut a few gears by hand. I made a rachet, and the clock was not entirely finished. I did that to see whether it would move these parts. Then I constructed some other parts out of wheels that had been in other clocks; that is, I took wheels that had been used, and made changes. In some I cut out teeth. In the description that I gave there of raising levers, and producing the movements of the hour hand and minute hand, were just portions of teeth. I don't exactly remember when I got from Shapley that gear-cutter, but it was some time during the old Faucet Company's operation, but what year I can't state.

Cross-Q. 1104. That was before the Haucks moved into your shop I understand?

[*Same objection.*]

A. Yes, sir.

Cross-Q. 1105. How long had you known Mr. Shapley at the time you moved up to Mechanicsburg?

[*Same objection.*]

A. I couldn't tell, but I remember where I met him first, and we were talking about some of these inventions. It was in a lodge-room; that was the first time I met him, to have a conversation with him.

Cross-Q. 1106. What were the inventions that you talked with him about?

[*Same objection.*]

A. That I don't remember. I don't remember what. I think that was before I moved to the shop where I am now; I think so.

Cross-Q. 1107. Was he accustomed to come to your shop during the early years of your occupation of your present shop; if so, how often?

[*Same objection.*]

A. He was there, yes, sir, frequently, at a pretty early time. I don't remember what years. I don't remember positively whether he was there before I moved to Mechanicsburg or not, but after that he came several times; not in the early years of my occupation, for I had not become acquainted with him until just before the Faucet Company started, and before I went into the lower shop; but prior to that time, I know he did not visit me. I mean prior to that early time.

Cross-Q. 1108. The bill of J. R. Miller against you has been produced, (page 896, [862,]) which appears to have been made out on one of your own printed bill heads, headed "Bought of Daniel Drawbaugh," and

Jan. 25, 1882, 2, P. M.

Examination resumed, pursuant to adjournment.

Present same counsel.

Cross-examination of Daniel Drawbaugh by Mr. Smith continued:

Cross-Q. 1099. Several of the witnesses have referred to a machine, which you had in your shop, for wrapping wire, as they termed it, was that a machine of your own construction; if so, when did you construct it?

[*Same objection.*]

A. Yes, sir; it was of my own construction. Part of the apparatus I constructed, I guess, before I went down to the shop I am in now; I can't tell you when I finished it; I applied a part to it—a treadle; the former part you run by hand; it might have been 1870, or perhaps earlier, or perhaps later, that I made the change.

Cross-Q. 1100. Did you construct a machine for cutting gears, in connection with your work on clocks, or in connection with any other work?

[*Same objection.*]

A. Yes, sir.

Cross-Q. 1101. When was that?

[*Same objection.*]

A. After I moved from Mechanicsburg. To the best of my recollection, it was about that time. But before I made that machine, I had one that I borrowed from Mr. Shapley; one they termed a wheel engine.

Cross-Q. 1102. Which of these machines did you use in cutting the gears on the Johnson Leonard clock?

[*Same objection.*]

A. I don't remember distinctly, but I think I used the one I made myself.

Cross-Q. 1103. In speaking of the first train of clock mechanism, which you made, and I think also, of the second, you said part of the gears were cut by hand. Did you cut the other part of the gears yourself, or use parts out of a clock that had been previously cut?

[*Same objection.*]

A. I used it in a former clock. I cut a few gears by hand. I made a rachet, and the clock was not entirely finished. I did that to see whether it would move these parts. Then I constructed some other parts out of wheels that had been in other clocks; that is, I took wheels that had been used, and made changes. In some I cut out teeth. In the description that I gave there of raising levers, and producing the movements of the hour hand and minute hand, were just portions of teeth. I don't exactly remember when I got from Shapley that gear-cutter, but it was some time during the old Faucet Company's operation, but what year I can't state.

Cross-Q. 1104. That was before the Haucks moved into your shop I understand?

[*Same objection.*]

A. Yes, sir.

Cross-Q. 1105. How long had you known Mr. Shapley at the time you moved up to Mechanicsburg?

[*Same objection.*]

A. I couldn't tell, but I remember where I met him first, and we were talking about some of these inventions. It was in a lodge-room; that was the first time I met him, to have a conversation with him.

Cross-Q. 1106. What were the inventions that you talked with him about?

[*Same objection.*]

A. That I don't remember. I don't remember what. I think that was before I moved to the shop where I am now; I think so.

Cross-Q. 1107. Was he accustomed to come to your shop during the early years of your occupation of your present shop; if so, how often?

[*Same objection.*]

A. He was there, yes, sir, frequently, at a pretty early time. I don't remember what years. I don't remember positively whether he was there before I moved to Mechanicsburg or not, but after that he came several times; not in the early years of my occupation, for I had not become acquainted with him until just before the Faucet Company started, and before I went into the lower shop; but prior to that time, I know he did not visit me. I mean prior to that early time.

Cross-Q. 1108. The bill of J. R. Miller against you has been produced, (page 896, [862,]) which appears to have been made out on one of your own printed bill heads, headed "*Bought of Daniel Drawbaugh,*" and containing below that the printed words, "PRACTICAL MACHINIST, small machinery, Patent Office models, electrical machines, etc., a specialty." When did you get those bill heads printed, and by whom were they printed?

[*Same objection.*]

A. I don't remember when I got them printed. I know by whom they were printed; by Ephraim Holsinger, who was a witness in this case.

Cross-Q. 1109. Did he print them while he was at Eberley's Mills?

[*Same objection.*]

A. Yes, sir.

Cross-Q. 1110. When did you begin to hold yourself out to the world as making small machinery, Patent Office models, and electrical machines a specialty?

[*Same objection.*]

A. I can't tell you. I made models of different kinds at a very early date. I can't tell you what date—a great while before I went down to the lower shop—and I know I made electrical machines before I went to that shop, I am positive.

Cross-Q. 1111. Do you mean that you made electrical machines for customers?

[*Same objection.*]

A. I don't remember that I did. I may have, but I can't just think of any now.

Cross-Q. 1112. Did you make electrical machines for customers after you went to that shop; and if so, what were they?

[*Same objection.*]

A. No, sir; I don't know that I did. I repaired. I made a portion of a clock for Mr. Shapley. I mean a magnetic clock.

Cross-Q. 1113. While the Haucks occupied the shop, did you have the use of the shop and tools, in the same manner as you had had while the Faucet Company was there?

[*Same objection.*]

A. Yes, sir; they gave me that privilege. I had a small room in the upper part of the shop that I occupied during the time they were there. The machinery, generally, was on the lower floor, and I did not use it unless they were not there, or were not using it. There was a pretty large portion of the time they occupied the shop that they were not running. There were months, sometimes, that they wouldn't come to the shop.

Cross-Q. 1114. When did they move their machinery away?

[*Same objection.*]

A. I think it was in the latter part of 1876; I think so; about that time; I can't remember; it may have been after; it may have been in the spring of 1877; I won't be positive.

Cross-Q. 1115. What machinery did the Axle Company put into the shop?

[*Same objection.*]

A. I will have to study that a little. There were a good many different machines. They purchased and put in two engine lathes; a drill press; they used a hand lathe that had belonged to Eberly, and that I had used there; and an emery wheel and machine for grinding axle bearings for boxes; a machine for polishing the inside of axle boxes. That is all that I can now remember.

Cross-Q. 1116. Did you have the privilege of using the machiney of the Axle Company while it occupied the shop?

[*Same objection.*]

A. Yes, sir; at times when they were not using, I used their machinery,—often at night.

Cross-Q. 1117. Has that machinery ever been moved away from the shop?

[*Same objection.*]

A. Some of it has; tools as a general thing—lathe tools, reamers, and things of that nature.

Cross-Q. 1118. When was it?

[*Same objection.*]

A. I don't remember what year; after they quit operating—quit work.

Cross-Q. 1119. Did not Mr. Chellis buy that machinery after he went there?

[*Same objection.*]

A. Yes, sir; but it had remained there for perhaps a year or a year and a half, or, perhaps, two years, that they were not doing much; that is, to the best of my recollection. The length of time I don't remember.

Cross-Q. 1120. Did the Grissingers put any machinery in there when they moved in?

[*Same objection.*]

A. Yes, sir; two small lathes, a grindstone, or rather two grindstones, one a surface grinder and the other an ordinary grindstone, some polishing wheels, some files. There were a few other small tools that I can't remember now.

Cross-Q. 1121. The Defendant's answer, on page 8, contains this statement: "That, notwithstanding his embarrassed and impoverished pecuniary condition, and his utter want of proper mechanical tools, materials, and appliances to conduct such work, he labored with all reasonable diligence to perfect and adapt his said improvements, and did, finally, in due exercise of such reasonable diligence, perfect and adapt the same." What portion of the time after you moved into that shop was it true, if at all, that you had an utter want of proper mechanical tools, materials, and appliances to conduct such electrical work as you had occasion to make?

[*Same objection.*]

A. Yes, sir; I don't think that I had the proper tools for making electrical apparatus.

Cross-Q. 1122. Do you think you had an utter want of proper tools?

[*Same objection.*]

A. Yes, I think I had; for it was necessary for me to have material to work on. In experimenting it was necessary for me to have a good many different materials that I didn't have.

Cross-Q. 1123. How came you to hold yourself out to the world as making electrical machines a specialty if you were in utter want of the proper mechanical tools?

[*Same objection.*]

A. I might have had an order for a machine, and then I might have supplied myself with the necessary material. I know in a good many other cases I did that. In some cases I would have an order and didn't have the money, and the party I made a certain instrument for would advance, though I do not know whether that was in any electrical machine or not.

Cross-Q. 1124. My question and the preceding one related to tools, not to materials. Do you think you had an utter want of proper mechanical tools?

[*Same objection.*]

A. I had, until the Clock Company; but I had no proper way of winding a magnet. I wound magnets up to that time by hand; that is, turned the spool by hand and held the wire in the other hand, which I know was not the proper way. There may have been other tools and apparatus that I cannot now think of. I know that I did not have the proper tools; I am confident of that. After they went in, they furnished the small lathes I spoke of, and after that I wound my magnets on a lathe.

Cross-Q. 1125. Will you name the parties who furnished you the means in advance to procure material for any machines which you had an order for?

[*Same objection.*]

A. I couldn't now. I know it has been done a number of times, but I can't name any parties now.

Cross-Q. 1126. Mr. Rufus K. Shireman, a witness who has been called by the Defendants, testifies on page 276 [264] of the printed record, that he saw at your shop an instrument of your invention, for registering drinks in a hotel; what kind of a machine was that, when was it made, and what became of it?

[*Same objection.*]

A. I don't remember that I said it was for registering drinks. It was an apparatus—you could place it, and it would register how often a gate or door would open, or you could apply it to an engine, to count the number of revolutions of the shaft. I had gotten that up for a party now living in Harrisburg, who got up an apparatus for weighing grain, and after he had got up his apparatus, it was necessary to have something to register the number of bushels that would pass through the machine. Now, about the drinks, that may have been said in the way of a joke; I don't remember the expression, though.

It would be hard for me to describe the machine. I termed it a counting machine.

It was composed of a number of wheels, got up in a peculiar shape. The principal wheel was a wheel with one cog or tooth on; right below that is a concave recessed wheel. To operate the first wheel of that description, there is in the center of that—where the hub would be—another small wheel provided with ten rachet teeth. Around these ratchet teeth is placed a lever arm with a pawl attached. By moving that lever ten movements, you cause the first wheel to make one revolution, which causes the second to make one tenth of a revolution, or pass one concave space; the third wheel would make one hundredth of a revolution; by moving the lever one hundred times you bring up a figure in the first wheel "I;" in the second wheel "O;" in the third wheel "O." By putting in a train of any number of wheels, you could count any number. I think 199,000 was the number that could be counted on the one I made for the party indicated. These gears were placed into a box, of the proper length. There was a cover on that box, and a small strip of glass, running nearly the whole length of the box, so that you could see only the space of one figure. If it is necessary, I have some parts of the instruments at the shop, that will illustrate it better than I can tell it.

I can hardly tell you when it was made. I could ascertain that by asking the gentleman who got me to make it—somewhere between 1873 and 1875, or before that. I don't know what became of it. It became lost. This party had taken it and tried it. There was a Company raised for the purpose of introducing, or putting out, his machine for weighing or measuring grain. The way I understood, the Company fell to pieces—never amounted to anything, and he never used it, and it came back into my possession.

Cross-Q. 1127. What was the name of the party for whom you made that medicine?

[*Same objection.*]

A. Abraham Hamaker, a brother of the one who has the drug store out here in Market street.

Cross-Q. 1128. Mr. Zacharias, one of the Defendants' witnesses, on page 60 [57] of the record, speaks of a gas governor, which you invented. When did you make that invention, what was it, and what became of it?

[*Same objection.*]

A. I made one, yes sir. That would be hard for me to say. That was at an early time. That was before I went to that shop where I am now, but what year I don't remember. It might have been about 1860, 1862, 1863, perhaps later, or perhaps a little earlier; but I made several the first year or two after I went down to that shop, for the purpose of having them tried.

It was an arrangement to register or equalize the pressure of gas. It was intended to be applied to the meter, which the consumer would have in his possession. I mean on his premises. I have parts of the several instruments lying about the shop now.

Cross-Q. 1129. For whom did you make these, or who had them for trial?

[*Same objection.*]

A. The first one I made was for trial—a very rough apparatus. I made the second more complete, in order to show it to the Drawbaugh Pump Company, for the purpose of illustrating it to them, for the purpose of getting them to take an interest in it. There were some inquiries made about the machine, and it was found that the Gas Company would not allow it to be attached to the meter. I guess for that reason there was nothing done. They didn't take an interest in it.

Cross-Q. 1130. In your answer to the 806th interrogatory, you mention that you did some work for William Morris, who lived at Bridgeport. What was the work you did for him?

[*Same objection.*]

A. I experimented for him in order to get up an arrangement for pressing or stamping lamp shades.

Cross-Q. 1131. Can you tell when you did that work, and what you got for it?

[*Same objection.*]

A. I couldn't, exactly. I could find out, though. I never got anything for making it. I had asked him for money several times, and he didn't have any, and after that he died. I may have got a few dollars on the bill. I don't remember, but I may have.

Cross-Q. 1132. Did you get up a stamp canceller at one time? If so, for whom, and at what time?

[*Same objection.*]

A. I did; for one Mr. Stees, who lived in Harrisburg. He intended to pay me for my time, and to pay all expenses of patenting it. He went and consulted Mr. Cameron about it, and showed him a stamp that I had made. Mr. Stees had it in his possession a long time, and seen Mr. Cameron a number of times. He told me that it would cost too much to introduce it—to get the government to take hold of it. That was at an early period. It was some time after the war. It was made before I went into that shop.

Cross-Q. 1133. Did you get up some inventions for Mr. S. M. Hertzler at one time? If so, what were they, and how much did he pay you for them, and when was it?

[*Same objection.*]

A. Yes, sir; a machine for stemming grapes. I don't remember what he paid me. I could hardly tell when that was. It was about 1871. It might have been a little earlier, or it might have been a little later.

Cross-Q. 1134. Did you get up a machine, at any time, for a Mr. Patton, at Harrisburg, for stamping metal? If so, what was the machine, when did you make it, and what did you get for it?

[*Same objection.*]

A. Yes, sir; it was for making carpet tacks. That was about the closing of the war, or it may have been before the closing of the war. I don't remember rightly; I think I got four hundred dollars for the machine, and afterwards they paid me fifty dollars for a second set of dies, for a different shaped tack. The money I had a good deal of bother getting hold of; it was paid by instalments.

Adjourned until Jan. 26, 1882, at ten, A. M.

Jan. 26, 1882, 11:15, A. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Cross-examination of Daniel Drawbaugh by Mr. Smith continued.

Cross-Q. 1135. You said yesterday that Mr. Abraham Hamaker, the man for whom you got up the counting machine, resides now in Harrisburg. Where did he reside at the time you got up the machine, and what was his business?

[*Same objection.*]

A. I think he resided at that time in the city here; I don't know what his business was; I only know he was experimenting on the machine.

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Cross-Q. 1136. Had he ever lived near to you?

[*Same objection.*]

A. Yes, sir.

Cross-Q. 1137. When was that and how long?

[*Same objection.*]

A. I don't know when he left there—he lived there three or four years, as near as I can recollect.

Cross-Q. 1138. What was his business when he lived there?

[*Same objection.*]

A. He was working in the mill; I don't know whether he counted himself a miller or not; it was then called Teahl's mill; it was a flouring mill.

Cross-Q. 1139. You mention speaking to Mr. Simon Oyster about taking an interest in yonr talking machine. Where did he reside at the time you spoke to him, what was his business and was he then a man of property?

[*Same objection.*]

A. He lived at New Cumberland. When I spoke to him about it, I met him here at Harrisburg. His father had been in the lumber business. He was then traveling with lightning rods; I suppose that was what led to a conversation on electricity. I always considered him wealthy.

Cross-Q. 1140. Did you at one time invent or construct a machine for making paper bags? If so, for whom, at what time, and what was done with it?

[*Same objection.*]

A. I did; I worked or experimented on the machine, but didn't fully complete it; it was a very temporary machine: it was for Henry Singiser. I spoke to him about taking an interest in some of my arrangements,—that is, in the telephone, particularly; he told me that there was something else that would be very valuable to be gotton up; he was then manufacturing paper bags at Mechanicsburg; that was during the spring or summer of 1876. The machine was partly made and dropped; he never went into it. As far as folding—that, I had it completed—folding bags; but it was intended to finish—fold and paste.

Cross-Q. 1141. Did you have any arrangement or understanding with him about that invention before you commenced work on it? If so, what was it?

[*Same objection.*]

A. I don't remember what. There was an arrangement; I was to get up a machine and he would get, if I am not mistaken, one half of the patent. I don't know whether there was anything mentioned that he was to pay expenses or not, but that was my idea, or my impression while I was working on it—that he was to furnish the pay for my time; because I know I needed money very bad at the time.

Cross-Q. 1142. Did he furnish you the materials for making your experiments or with money for obtaining them?

[*Same objection.*]

A. No, sir; to the best of my recollection he didn't. It was very simple; it was made of pine boards; I don't suppose all the material in it would cost over a dollar or a dollar and a half; the time was more than the material, a good deal.

Cross-Q. 1143. What was the reason that the machine was not completed and put in operation?

[*Same objection.*]

A. I can't say; though at a time after that, I can't say how long, he he was unfortunate—he failed; his machinery was sold.

Cross-Q. 1144. Did you get up any machinery for the Axle Company while they occupied the shop? If so, what was it?

[*Same objection.*]

A. I did. I can hardly remember. There were different machines; I will have to reflect a little; there was none of them very complicated. The most of them were in the way of tools—reamers and such things, adapted for boring boxes for axles; two machines for finishing the part of the axle that was called the cone; that is, for finishing the inside of an adjustable cone; we termed it a drifting tool. Another was an application of a device placed on a lathe, for adjusting the tool for that part of the axle, which was called the cone on the spindle.

Cross-Q. 1145. Were any of those machines or tools adapted for cutting square holes?

[*Same objection.*]

A. That drifting tool was adapted for that purpose.

Cross-Q. 1146. I think you referred, page 931, [895,] to a machine for knotting carpet rags. What kind of a machine was that, when was it got up, and what was done with it?

[*Same objection.*]

A. I will have to describe it by a sketch. It was termed a carpet-rag needle. It was composed of a thin blade of steel, with an opening through the blade towards the upper end. There were small teeth in the upper part of the opening. The lower end was provided with a small wood screw, which was attached to the blade by solder. The upper end of the blade was harpoon-shaped, ground to an edge; that is as near as I can describe it. I don't remember when it was got up. It was at a pretty early time. I might get at the date by referring to some parties who had bought them and sold some of them. I have got some of them yet.

Cross-Q. 1147. Who were the parties who bought and sold them?

[*Same objection.*]

A. I don't remember all; one Abraham Ditlow was one; another was Joseph Ditlow,—Johnson Leonard. There were some others that I don't remember.

Cross-Q. 1148. What was the business of those parties whom you have named, at the time they bought and sold these machines?

[*Same objection.*]

A. I don't know that they had any particular business. They were not doing much—either of those parties; the Ditlow boys—their business, in the winter season, sometimes, was trapping.

Cross-Q. 1149. Did you ever invent a stethoscope; if so, for whom, and at what time?

[*Same objection.*]

A. We had part of it here, connected to a telephone—instrument "P"; the rubber tube with the coiled spring in it, and the ear-piece are parts of the stethoscope. It required two ear-pieces. I intended it to be part of the telephone, and discovered afterwards that it would do for a stethoscope.

Cross-Q. 1150. In reference to your solar transit, I find in the interference record, to which reference has been made, on page 61, in answer to cross-interrogatory 115, this statement in your deposition; you were asked, "*How often did you make those observations?*" referring to observations of the sun, and you said, "*I cannot positively say how* *often, but think that time I made observations every day; after that, every week, for a time; then there was a time when I made observations every two weeks. Them observations were cantinued, to the best of my knowledge, six or eight months, or perhaps one year.*" Is that in accordance with your recollection at that time?

[*Same objection.*]

A. Yes; I don't positively know how long. I approximated, or guessed, at the time.

Cross-Q. 1151. What was the object of those continued observations?

[*Same objection.*]

A. To try, or test, the proper time of a clock that I was then timing.

Cross-Q. 1152. One of your magnetic clocks, I suppose?

[*Same objection.*]

A. Yes, sir.

Cross-Q. 1153. Do you remember which one?

[*Same objection.*]

A. No, I don't exactly; I remember at the time, it didn't have any case. It wasn't the one I had given to Shapley. It was one that had no finished case. It was in part of a case, though, without any front cover.

Cross-Q. 1154. One of the witnesses in the interference case, to which I have referred, is named John C. Smith. Is he the same John C. Smith who has been called by the Defendants as a witness?

[*Same objection.*]

A. Yes, sir.

Cross-Q. 1155. On page 121 of the interference record, in answer to interrogatory 3, he states, that in the summer of 1877, he was in Daniel Drawbaugh's shop, working at a small stationary engine for himself. Do you remember his working on that engine?

[*Same objection.*]

A. Yes, sir; I remember he was working on an engine, but I didn't remember the time. He had been working on it for quite a while, but don't remember any particular period.

Cross-Q. 1156. How long a time, in all, should you think he worked on it in that shop?

[*Same objection.*]

A. I don't know how long. My idea would be, it was more than a year he was working on it, off and on. It may have been more.

Cross-Q. 1157. You have spoken of the pump, which was constructed under your first faucet patent. Did you invent or construct any other kinds of pumps?

[*Same objection.*]

A. I worked on a different kind of pump, yes, sir. I didn't claim it as a particular invention. It was composed of an iron stock, to be placed on to the bed of the well, or cistern, and connected by iron tubing, or gas pipe, of some kind; through that was a rod, that was connected to the handle of the pump, and the opposite end fastened to a piston, similar to other pumps.

Cross-Q. 1158. When did you work on this pump, and how much?

[*Same objection.*]

A. I don't remember when I made the first one. It might have been as far back as 1868 or 1869. The number I don't remember. I could tell by a little reflection. I didn't make many—four, that I remember of.

Cross-Q. 1159. Were these made while the Faucet Company occupied the shop?

[*Same objection.*]

A. The first one or two were. The last one was made, perhaps a year and a half ago.

Cross-Q. 1160. Did you get up any other pump of any kind?

[*Same objection.*]

A. Not that I can remember of now.

Cross-Q. 1161. Did you ever get up, and manufacture, a syphon pump, or steam pump, of any kind? If so, state what it is.

[*Same objection.*]

A. Yes, I forgot about that. I got up a set of patterns for Mr. Stevenson, and I manufactured a few. I don't remember how many.

Cross-Q. 1162. When was it that you manufactured those steam pumps, and were they pumps of your own invention, or did they embrace any invention of yours?

[*Same objection.*]

A. These that I manufactured for Stevenson, I don't remember the time. I manufactured some of them during the time that Mr. Chellis took charge of the shop. Part of it was on a principle that I got up the model of one—quite a number of years ago. I didn't call it a pump then—a device for supplying steam boilers with water.

Cross-Q. 1163. Did you make any of those pumps for Mr. Stevenson, before Mr. Chellis took hold of the business, and if so, how long before?

[*Same objection.*]

A. Yes, sir; I don't remember how long. It might have been a year or two.

Cross-Q. 1164. Where does Mr. Stevenson reside, or carry on business, and how long have you been accustoned to deal with him in any way?

[*Same objection.*]

A. He resides in Harrisburg. He has got a machine supply store there. I have been accustomed to deal with him quite a number of years. The old Faucet Company had some of their work made in his shop, during the time that he run a shop here in Harrisburg. That was prior to the time that they run the shop that I am now in.

Cross-Q. 1165. What other dealings have you had with Mr. Stevenson, since that time, besides what related to pumps?

[*Same objection.*]

A. I don't remember any particular dealings. I had manufactured some small arrangements, that he termed a flue cleaner; I had made and changed some of the patterns on those machines for him, and he furnished the materials; he also furnished the materials for those syphon pumps. There may have been some other dealings; I don't remember.

Cross-Q. 1166. Did you make any of those pumps for other parties than Mr. Stevenson?

[*Same objection.*]

A. I made one for Ahl & Brother.

Cross-Q. 1167. When was that?

[*Same objection.*]

A. As near as I can remember, two years ago, perhaps.

Cross-Q. 1168. When did you get up the model for the boiler feeder, to which you have referred?

[*Same objection.*]

A. That is so long that I couldn't tell within five or six years, maybe more; it was a number of years before the starting of the Rebellion—before the war.

Cross-Q. 1169. You invented, I believe, a second faucet, which was the subject of the interference between you and Mr. Hauck; were you working on that invention after the first Faucet Company was formed, down to the time when Mr. Chellis first took hold of it?

[*Same objection.*]

A. Not working on it all the time. I had made a machine, that I termed a pressure blower; and, some time after that, I don't remember the length of time, I made a wooden machine on nearly the same principle as the faucet, that Mr. Chellis has an interest in.

Cross-Q. 1170. Who was occupying the shop, when you made the blower, and when you made the wooden machines, to which you refer?

[*Same objection.*]

A. The old Faucet Company.

Cross-Q. 1171. Were you working on this second faucet in 1877?

[*Same objection.*]

A. I don't remember the periods exactly; I worked at it at different times.

Cross-Q. 1172. Do you recollect testifying in the interference case, relating to that invention, that you made your first model in the year 1870?

[*Same objection.*]

A. I don't remember the period—it was at an early period that I made the blower, and not a great while after that, I made this wooden model of the faucet; I am aware that I testified in regard to the making of these models.

Cross-Q. 1173. I read from your testimony in the interference record, page 8, the 27th question and answer. "*According to the best of your recollection, in what year did you make that model? Answer. In the year* 1870, *to the best of my knowledge.*" Was that statement correct and did it relate to the first model?

[*Same objection.*]

A. I suppose it did; as I said now, I might have then reflected on it, and knowed the time by circumstances; I can't now name the year.

Cross-Q. 1174. I read your two questions, and the answers, on page

10, of the interference record, from your deposition. "*Question* 45. *Subsequent to* 1870, *did you make any further experiments upon the faucet, with a view to perfect it? Answer. Yes, sir; I made another model; the construction was about similar to this one of* 1870; *the difference being, that there were no semi-circular guides for the dividing plate; the dividing plate merely passed through the wall of the case, into a small chamber, something similar to the one in the model now before me, marked 'C. D. C. M.'*

Question 46. *When did you make that second model? Answer. About two years, or a little more, after I made the first one.*"

Were those answers correct?

[*Same objection.*]

A. Yes, sir; I am satisfied they were; they were then, to the best of my recollection; I am certain of that.

Cross-Q. 1175. I read from page 11, of your deposition in that case, the 50th interrogatory and answer. "*Returning to the third model spoken of, when was it made? Ans. I cannot give the exact date; I made it, to the best of my knowledge, about* 1877—*in that year.*"

Is that correct?

[*Same objection.*]

A. Yes, sir; that is one that my brother had intended to take an interest in, and I think, a gentleman that is residing in Harrisburg. I forget his name now.

Cross-Q. 1176. What more did you do, on that faucet, before you made your arrangements with Dr. Moffitt and Mr. Chellis to take an interest in the invention?

[*Same objection.*]

A. I made another model.

Cross-Q. 1177. When was that?

[*Same objection.*]

A. I don't remember now; I must reflect a little, and then I can get at it pretty near; I guess it was some time in 1878, as near as I can remember.

Cross-Q. 1178. Was it while the Clock Company was carrying on the business?

[*Same objection.*]

A. Yes, I think it was. William C. Diven was the man who thought of taking an interest in the faucet—the one that I think I made in 1877, as near as I can remember.

Cross-Q. 1179. What was the character of your arrangements with Chellis and Moffitt, about that invention?

[*Same objection.*]

A. They were to pay all expenses, and each one was to have one third interest. They paid me, at the time that we closed the bargain, two hundred or two hundred and fifty dollars; I don't remember the amount; though, providing the faucet was not patented, they held me for the two hundred and fifty dollars, or the amount that they paid me.

Cross-Q. 1180. In your answer to the 170th direct interrogatory, on page 809 [777] of the printed record, referring to the wagon you painted for Jacob Sadler, you said it had a hydraulic ram on the sides of the wagon; what was the reason for that?

[*Same objection.*]

A. It was an ornament, or a portion of the painting of the wagon; the wagon was designed for hauling out the rams and pipe.

Cross-Q. 1181. What rams and pipe?

[*Same objection.*]

A. The ram that I had made there in the shop.

Cross-Q. 1182. Was that a ram of your own invention, or containing any invention of yours?

[*Same objection.*]

A. Partly.

Cross-Q. 1183. What was it?

[*Same objection.*]

A. The difference between the ordinary ram and this was, that, at the upper portion, where the puppet valve worked, above its surface, and at the side of the seat, is a raised projection in the body that carries the valve, for holding air, which facilitates the movement of the valve; that is, when the momentum of the water ceases, it produces a reaction, which forms a partial vacuum The air that is contained in there has a tendency to bring the valve back from its seat. When that goes back it receives a new supply of air. A portion of that air passes into the air-chamber, on the next impulse of the water, for the purpose of keeping the air-chamber supplied with air, which is necessary for a hydraulic ram to work satisfactorily.

Cross-Q. 1184. Were you, at that time, engaged in the manufacture and sale of those rams, and in putting them up for people about the country?

[*Same objection.*]

A. Yes, sir; to some extent.

Cross-Q. 1185. Did you employ Mr. Sadler to carry them out to customers?

[*Same objection.*]

A. I didn't employ him, no, sir; he took an interest and furnished the money to run the business. He furnished a team and wagon and bought a lot of pipe and fittings.

Recess for dinner until 2 o'clock, P. M.

Jan. 26, 1882, 2, P. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Cross-examination of Daniel Drawbaugh by Mr. Smith continued:

Cross-Q. 1186. What was the arrangement you had with Mr. Sadler; what interest did he have in the business?

[*Same objection.*]

A. I don't remember what arrangement any more. I was to be paid for what time I put in, and he would be allowed for what portion he would put in, and the balance would be equally divided, and the profits were to be equally divided, to the best of my recollection. I don't remember exactly.

Cross-Q. 1187. How long did this arrangement continue, or how long was he interested in the business?

[*Same objection.*]

A. I don't remember how long. It wasn't very long. I don't think it continued one summer. I think not; not more than one season.

Cross-Q. 1188. Did any other party at any time have an interest in this business? If so, who was it, when, and how long did it continue?

[*Same objection.*]

A. A. H. Gardner had an interest for a short time. I don't remember the length of time. I think it was before the arrangement with Sadler.

Cross-Q. 1189. What was your arrangement with him in reference to the business?

[*Same objection.*]

A. As near as I can remember it was about the same. I don't remember the particulars about the arrangement.

Cross-Q. 1190. You built the rams at the shop I suppose; did you help to set them up?

[*Same objection.*]

A. I helped to set them up, yes, sir.

Cross-Q. 1191. What did Gardner and Sadler do?

[*Same objection.*]

A. They helped to set them up. Gardner, when he was in, seen the parties and made contracts,—that is, for two or three.

Cross-Q. 1192. What price was charged for the pumps separate from the pipe that was required?

[*Same objection.*]

A. There were three prices; that is, for three sizes. The largest, I think, was twenty dollars. The next was fifteen, and the next, smaller than that, was eleven dollars.

Cross-Q. 1193. Did you charge for setting up the pumps in addition to their price and the price of the pipe?

[*Same objection.*]

A. Yes, in some cases we did. I don't know whether we did in all.

Cross-Q. 1194. How much did you charge for the pipe above what it cost you; what percentage?

[*Same objection.*]

A. That would be different. Parties who would sell the pipe would send the retail price list, and the percentage, allowed on the pipe, would be different, at different times.

Sometimes it would be 35, 40, 45; sometimes as high as 50 per cent. off.

Cross-Q. 1195. That is, you bought pipe at a discount from the retail price of the parties selling it, and you sold it to your customers at the retail price of the manufacturers?

[*Same objection.*]

A. Yes, sir; of the manufacturers.

Cross-Q. 1196. Of whom did you buy the pipe?

[*Same objection.*]

A. I don't remember all the different parties. I remember one or two. I could ascertain in the morning from bills that I have. One is Morris, Tasker & Co., of Philadelphia, I think.

Cross-Q. 1197. Can you give me the names of the parties to whom you sold rams and pipe?

[*Same objection.*]

A. Henry Herr was one. That was sold to him by Gardner and myself, when we had it. Another man was Trimmer. I don't remember his first name. He lived in Adams county. I think those were all that Gardner and I put in, while we were together. Another one I put in for William Stephen, at a very early date. Then it was replaced with another ram, at or near the time when Mr. Sadler went in. I put one in for Mr. John T. Smith. Another one I think of now, that Mr. Gardner and I put in, for a gentleman named Brand. His first name I don't remember. That is all that I can remember now. There may be some others that I don't think of.

Cross-Q. 1198. Have you any means of ascertaining the names of all the parties to whom you sold rams and the price which they paid?

[*Same objection.*]

A. I don't know; some of the bills and accounts of them have been lost; but, if I was to reflect over it awhile, I might.

Cross-Q. 1199. Do you remember the price you got for Trimmer's rams?

[*Same objection.*]

A. I don't remember the price.

Cross-Q. 1200. Have you ascertained the amount which you received from Mr. Eberly and Mr. Croll and Gardner, of which I enquired at an early period in the cross-examination, page 916, [881,] answer 718; if so, will you state what it is?

[*Same objection.*]

A. I did from Mr. Eberly, from the account in his books; I will just read them off.

(*Further answer objected to by Mr. Hill as secondary and hearsay*)

Mr. Jacobs and I called on Mr. Eberly and he showed his books, and referred to the charges; the first charge of C. Eberly against me is February 5, 1849.

July 12, 1864, a balance against me	$271.12
From this time to the close of the year 1864 I fell further in his debt,	112.48
In the year 1865 I got from him flour, feed, etc.,	96.82
In the year 1866 flour, feed, meat, etc.,	86.06
1867 to March 28 he charges,	21.73
That is as far as Mr. Eberly's bill runs.	
In addition to the above there are charges for meat in 1863 and 1864,	43.46
Meat bill of 1865,	1.43
On the 26th of December there appears a charge against me of	398.71

In January, 1861, he started a new book, and he does not seem to have carried it over.

That is all; I did not see Mr. Gardner or Mr. Croll; I did not have time.

Cross-Q. 1201. Was Mr. Jacobs with you when you obtained this information from Mr. Eberly?

A. Yes, sir.

Cross-Q. 1202. And were those the charges which were squared between you and Mr. Eberly as stated in your answer to the cross-interrogatory 716?

A. There appears to be no settlement; we spoke of a settlement, and he showed me what I owed him, and I said I had no money—I don't remember the language; he said he knew I had no money, and that we would call it square, but it never was squared in his books; I was under the impression that we had settled it.

Cross-Q. 1203. Has he ever called on you to pay the balance, which appeared then to be due from you?

A. I guess he has, yes, sir, at a later time; I don't remember the time exactly; it was during the time the Axle Company was running the shop. Mr. Eberly had become in middling straitened circumstances; he was partly broken up; and I had been using his turning lathe for a number of years, and I paid him for it, and not on the old account. I think the money was paid by the Axle Company, or was paid out of money I got from the Axle Company.

Cross-Q. 1204. In the answer, to the 716th cross-interrogatory, which I have read to you, you say that Mr. Eberly said, "We will square accounts;" "I owed him several hundred dollars, to the best of my recollection." Now, what I want to know, is, whether Mr. Eberly ever called upon you to pay the balance, which was due at that time, and which he said he would square?

A. That I don't remember; very likely he did call on me; I don't doubt but that he did; I don't positively remember if he did; I would certainly say so, if I would remember of him calling on me.

Cross-Q. 1205. Did Mr. Eberly's book which you examined contain credits to you for all the work you had done for him during the period covered by these accounts?

A. No, I don't think they do; there was some credits in; I didn't take any account of the credits; them were charges, that I had reference to.

Cross-Q. 1206. In your answer to the 717th cross-interrogatory, you say, that when Mr. Eberly said you would square accounts, may have been in 1865, 1866 or 1867, and in your next answer, you said, you would try to ascertain when that settlement actually was; have you done so?

A. I was under the impression that we had a settlement; his book don't show any settlement; I knowed he spoke of a settlement, and my impression was, there was a settlement; I told him I didn't have any money; he said he would square accounts, or something to that amount; I can't remember the language.

Cross-Q. 1207. Do you remember a suit that was brought by Lee & Bayler against you and Fettrow to enforce a lien for lumber which you purchased of them and sold to Fettrow?

A. It was a suit brought against me, I remember.

Cross-Q. 1208. Do you remember another suit that was brought against you by Mr. Mosser, attorney-in-fact for Lee & Bayler, in 1879, before H. M. Rupley, Justice of the Peace, to collect a balance of account?

A. My impression is that it was only one suit. I don't remember of two suits.

Cross-Q. 1209. Do you remember judgment being obtained before Mr. Rupley in that suit, and that you appealed it?

A. Yes, sir; I put in a bill, or offset, against their account, and Mr. Lee plead the limitation on my bill. That was on the day we appeared at Mr. Rupley's—the day of hearing.

Cross-Q. 1210. What was the account which you set up in offset?

A. The account extended a good while. I had been doing their repairs at the mill for a number of years. The first was Eberly, and Frank Lee; then the firm changed to Eberly and John Lee. At one time it was John Lee alone, then Lee and Bayler. It always had been arranged that when one party went out, the other party agreed to pay the outstanding bills. They had told me that was the arrangement.

Cross-Q. 1211. You claimed, if I understand you, that taking the accounts between you and the successive parties you have mentioned, for the whole period, there was no balance against you at the time the suit was brought, or a very small balance, if any.

[*Same objection.*]

A. I won't say that. I didn't know. I thought there would be a balance, but I wasn't sure.

Cross-Q. 1212. Will you look at the affidavit, a copy of which I find in the records which have been produced by the Defendants, ("Exhibit Drawbaugh Judgments,") and which I will read as follows:

"Copy of affidavit of defense.

John F. Lee & Henry Bayler, trading as Lee & Bayler, vs. Daniel Fettrow, owner or reputed owner, & Daniel Drawbaugh, contractor.	In the Court of Common Pleas of Cumberland County, No. 201, Nov. T. 1878.

Before me, M. F. Thompson, Dep'y Proth'y of the Court of Common Pleas of Cumberland County, personally appeared Daniel Drawbaugh, one of the Defendants above named, who, being duly sworn according to law, doth depose and say, that he has a just and legal defense to the whole of the Plaintiff's demand in the above suit, the nature and character of which is, that for a period of years, he, the said Daniel Drawbaugh, had been doing skilled labor for Plaintiffs in above, to the amount of in the neighborhood of two hundred & sixty dollars, that the lumber was bought on the faith & credit of the indebtedness of Plaintiffs to Defendant; that he is prepared to settle with Plaintiffs and, if he owes them anything, is prepared to pay the same & further saith not.

Affirmed & subscribed before me this 31 day of October, 1878. M. F. THOMPSON, Depy. Prothy.	DANIEL DRAWBAUGH."

Does that affidavit state what you understood to be the true situation of accounts between you and the parties at that time?

A. Yes sir; as far as that I knowed I had this bill against them, and I knowed they had a bill against me, but I thought my bill was more than theirs, and I did this for the purpose of getting my money.

Cross-Q. 1213. You mean that you bought the lumber which you let Fettrow have for the sake of getting the balance which you thought was due you?

A. Yes; because I had heard that Mr. Lee didn't intend to pay the bills contracted by the former firms; that is, it was reported.

Cross-Q. 1214. Do you remember the amount which you got from Mr. Fettrow that you thought would square the balance?

A. I don't remember now. I could ascertain the amount if it is necessary.

Cross-Q. 1215. Did Mr. Fettrow pay you for the lumber?

A. Yes, sir; that is, we settled it through some settlements that we had.

Cross-Q. 1216. Will you examine the affidavit which I now read to you as follows:

"H. R. Mosser, att'y in fact for
Lee & Bayler
vs.
Daniel Drawbaugh.
} Appeal from judg't of H. M. Rupley, Esq., J. P.

State of Pennsylvania,
County of Cumberland.
} ss.

Personally appeared before me, R. M. Graham, Proth'y for the County aforesaid, Dan'l Drawbaugh, who, being duly sworn, says that he has a just and legal defense to nearly all of the plaintiff's demand in above stated appeal, the nature and character of which is as follows, to wit:

1st. A mechanic's lien has been filed against Dan'l Fettrow, owner or reputed owner, and Dan'l Drawbaugh, contractor, to No. 201 November Term, 1878, and a Sci. Fa. issued thereon for the same claim, on which the above judgment was rendered and a non-suit offered thereon in open Court.

2d. Daniel Drawbaugh, the above-named Def't, is a machinist by trade, and as such was employed to do work for Eberly & Lee, the predecessors of Lee & Bayler, by repairing machinery and engine in the saw-mill of Plffs., said skilled labor commencing the 17th day of February, 1866, and ending on the 25th day of May, 1876, during which period he did work which aggregated five hundred and ninety dollars, on which said amount he claims interest from six months after last work ordered for Eberly & Lee, John Lee, and Lee & Bayler.

That there was a running account with the various firms above named, from Feb. 7th, 1866, to the 25th day of May, 1876, with a distinct understanding between Deft. above named and the Plff's above named, that they, the Plff's, would pay him, the Deft., for work done for the firms of Lee & Eberly and John F. Lee. That the Deft. was apprised of the contemplated dissolution of the co-partnership between Lee & Bayler, and went to them and bought lumber to save his claim for work done. Plff's did not hesitate to furnish said lumber on the faith and credit of their firms and the firms Lee & Eberly and John F. Lee's indebtedness, with the further understanding that a settlement of all claims between them should be made in the spring following. That Plff. believes, upon a just and equitable settlement of all matters in dispute between them, he, the Deft., would be indebted to the Plff's in the sum of from $16.00 to $20 00, which amount he is now prepared to pay. That he does not file this appeal for the purpose of delay, but that he verily believes that injustice would be done him if the judgment of the justice should be permitted to stand; and further said not.

Daniel Drawbaugh.

Sworn and subscribed be-
fore me the first day of March,
A. D. 1880.
R. M. Graham, Proth'y."

and state whether you remember making it upon the appeal of that suit?

A. I do remember making it, but I had forgotten it. It was prepared by an attorney whom I had employed to defend the case.

Cross-Q. 1217. That affidavit, I suppose, correctly expresses what you understood to be the relations between the parties and your reasons for making the final purchase of lumber which Fettrow had?

A. Yes, sir; that is, I made a statement to the attorney of the nature of the case, and he drawed that up. Legal papers I don't understand as I should, perhaps.

[*Plaintiff's counsel now offers in evidence a certified copy of the account which was the cause of action, and upon which judgment was rendered Feb. 7th,* 1880, *in the suit Mosser, att'y-in-fact of Lee & Bayler, against Daniel Drawbaugh, before H. M. Rupley, Esq., Justice, to be marked "Exhibit Mosser Claim."*

The charges in said account extend from April 25, 1873, to Feb. 28, 1877, and amount to	$132.65
1876, August 25, Cr. by bills to date,	71.92
	$60.73
Interest,	10.67
	$71.40]

Cross-Q. 1218. Will you look at the accounts which I now hand you, and state whether they are accounts which you rendered from time to time to Eberly & Lee, John F. Lee, and Lee & Bayler?

A. Yes, sir; them are bills that I presented to them. At what time I don't remember.

[*Counsel for Plaintiffs offer the above-mentioned bills in evidence, to be marked "Drawbaugh's Bills for Repairs done for Eberly & Lee, John F. Lee, and Lee & Bayler." The bills are five in number.*

The amount and dates are as follows:

Eberly and Lee, Fed., 1866, to June, 1870,		$46.47
John F. Lee, Sept. 1870 to Sept. 1872,		52.42
" " Jan. 1873 " April, 1873,		21.25
Lee and Bayler, April, 1873 to March, 1875,	$56.97	
" " April, 1875 to May, 1876,	14.95	
		71 92
		$192.06)

[*By consent, copies of said bills are put in evidence, the originats to be produced when called for, said copies to be subject to all legal objections which could be made to the original.*]

Cross-Q. 1219. Will you look at the two accounts which I now hand you and say whether they are the accounts which John F. Lee, and Lee & Eberly rendered you?

A. I suppose they would be correct bills. I don't remember the amounts of the bills.

[*By consent, the following copies of said bills are put in evidence, the original to be produced when called for. Said copies to be subject to all legal objections which could be made to the originals.*]

ELEPHONE COMPANY,-2

(First bill.) “Daniel Drawbaugh,

Bot. of Lee & Eberly.

1863.		
June 14,	To 100 ft. Walnut,	2.50
“	“ 164 “ Pine,	4.10
“	“ 77 “ Poplar,	1.15
Aug. 20,	“ 85 “ Hem,	1.10
1868.		
Aug. 18,	“ 159 ft. Bds. @ 26,	4.13
“	“ 150 “ Flour @ 33,	4.95
“	“ 26 “ Plk. @ 2½,	60
“ 21,	“ 138 “ Hem. Sct. @ 18,	2.48
“	“ 95 “ Pine @ 20,	1.90
“	“ 55 “ Plk. @ 25,	1.37
“	“ 500 Shg. @ 7½,	3.75
Sept. 1,	“ 230 ft. Floor @ 33,	7.59
“	“ 137 “ Bds. @ 26,	3.56
Oct. 7,	“ 750 “ W. B. @ 33,	24.75
“	“ 66 “ faced Bds. @ 3,	1.98
“	“ 347 “ Roof Lath @ 60,	2.08
“	“ 86 “ Sct. @ 17,	.95
“	“ 100 “ Bds. @ 15,	1.50
Nov. 17,	“ 26 “ Plk. @ 5,	1.30
		$71.74”

(Second bill.)

“Daniel Drawbaugh

Bot. of

Jno. F. Lee.

1870.			
Sept. 28,	To 18 ft. Oak	@ 30,	.54
Dec. 3,	“ 92 ft. Lin. 4x4=122	@ 25,	3.05
7,	“ 50 “ “ = 67	@ 25,	1.67
1872.			
Aug. 26,	“ 2 ps 3x11x18=99 ft.	@ 20,	1.98
“ “	“ 106 ft. Bds.	@ 2¼,	2.39
“ “	“ 200 “ “	@ 12,	2.40
“ “	“ 730 “ 6x4 & 8x4	@ 12,	8.76
“ “	“ 150 “ Oak Lath	@ 1¾,	2.62
“ “	“ 50 “ Oak plk.	@ 2½,	1.25
			$24.66.”

[Defendants' counsel objects to the introduction by Complainants of the papers purporting to be accounts, and statements of accounts, between Daniel Drawbaugh and Lee & Eberly, John F. Lee and Lee & Bayler, and to the affidavits and other papers, introduced by Complainants, relating to the suits above mentioned; and to the cross-examintion of the witness thereupon, for any purpose except to show the amonnt of money received by Daniel Drawbaugh at different times, or the amount of his indebtedness, at different times, or as bearing on said qnestions of the receipt of money, or indebtedness, or his financial condition, said evidence being, for all other purposes, immateral, irrelevant and incompetent, and improper on cross-examination. This objection is made to all the cross-examination, which has been going on, up to this point, on those subjects, and to all that may follow.]

Cross-Q. 1220. Will you look at Lee & Eberly's account and state whether the lumber, which is charged you in 1868, was the lumber which you used in repairing your house after you purchased it?

A. It is very likely this is the bill. I guess that is the bill. I would suppose it to be.

[Counsel for complainants calls attention to the fact that in "Exhibit Drawbaugh Judgment," the copy from the record in Mechanics' Lien 1006, *Lee & Bayler* vs. *Fettrow and Drawbaugh, the claim refers to "bill annexed," but no bill is annexed.]*

[By consent a copy of said bill annexed is put in from another transcript, and marked "Lee & Bayler's Bill Annexed."]

Cross-Q. 1221. Do you remember, while the Axle Company occupied the shop that you now occupy, that there was an interference between Frederick W. Wild and Jacob Kline on the axles which they manufactured, in which you testified as a witness on behalf of Mr. Kline?

A. Yes, sir; I remember of Kline having an interference with some person. I had forgotten the other parties name—I remember that I testified.

Cross-Q. 1222. Do you remember that Mr. Theophilus Weaver was Mr. Kline's counsel in that proceeding?

A. Yes, sir.

Cross-Q. 1223. Had you known him before that?

A. Yes, sir.

Cross-Q. 1224. It appears by the caption of the deposition in that interference, in the printed record which I have, that they were taken at the office of D. C. Maurer, in Harrisburg, No. 200 Walnut street, on the 26th day of October, 1875. Do you remember whether that was the time and place?

A. I don't remember the time; I remember the place.

Cross-Q. 1225. Will you look at what purports to be your deposition, on the forty-first and forty-second pages of that printed record, and state whether you remember testifying as there stated?

[*Objected to by Mr. Hill, as new matter not referred to in the direct examination, and as irrelevant and immaterial.*]

A. Yes, sir; I remember by reading over it now. I couldn't remember just everything I said then.

Cross-Q. 1226. Do you remember making the model and doing the other work mentioned in that deposition?

A. I remember it from charges in an account that I had. I remember, too, of making work for him of that nature.

[*Counsel for Complainants offer said deposition in evidence, to be marked "D. Drawbaugh deposition in axle case."*]

[*Counsel for Defendants inquires for what purpose this last-mentioned exhibit is offered in evidence on cross-examination.*]

[*Counsel for the Complainant replies that he introduces it to show, among other things, the witness' occupation as a model maker.*]

[*Defendants' counsel says that that has been abundantly proved and never denied, and he objects to the introduction of the exhibit as new matter not referred to in the direct examination, and as immaterial, irrelevant, and incompetent.*]

DANIEL DRAWBAUGH.

Adjourned until Jan. 27, 1882, at ten, A. M.

Jan. 27, 1882, at ten, A. M.

Examination adjourned by consent until February 13, 1882, at 2, P. M.

February 13, 1882, 3, P. M.

Examination resumed pursuant to adjournment.

Present, Mr. Smith and Mr. Storrow for complainants, and Mr. Hill and Mr. Jacobs for respondents.

Cross-examination of Daniel Drawbaugh by Mr. Smith continued:

Cross-Q. 1227. In your answer to the 87th interrogatory, you produced a sketch representing instrument "B," as you first made it, as I understand, where the armature of the electro-magnet is connected to a diaphragm on the tin tube by a string, and, in your answers to the 110th, 111th, and 112th interrogatories, you say that the board of exhibit "B" is not the same as that which you used when the instrument was in the form shown in "Drawbaugh sketch, No. 2," and I understood you to say the magrets are not the same, and that the tin tube may or may not be the same. Am I correct in my understanding of what you said about the electro-magnets?

A. I had a number of magnets. I ain't positive that they are the same. I had a number of magnets, and I am pretty positive that the magnet that is on now, isn't the same that was on when I used the string.

Cross-Q. 1228. Then, no part of the instrument represented by sketch No. 2 is to be found in exhibit "B" as produced, unless it may possibly be the tin tube?

A. I don't suppose there is any, and I ain't too positive that that is the same tube. The construction was the same, only. the string, and the armature suspended on a bracket.

Cross-Q. 1229. Did you dispense with the string; did you make an entirely new instrument, with the exception, possibly, of the tin tube, or did you simply alter the instrument, which you had previously had with the string?

A. That I don't remember; I made changes, as I said, in the magnets, and it would be likely that I took away the string and put the armature to the centre of the diaphragm, and moved the magnet up to the armature.

Cross-Q. 1230. After you dispensed with this string, did you ever go back to that form of instrument again?

A. I think not; I don't remember, but I think not.

Cross-Q. 1231. How many times did you change the electro-magnets on the instrument, after you dispensed with this string?

A. I don't remember how many times; I know I had different other magnets; the number I don't remember.

Cross-Q. 1232. Did you dispense with this string and put the instrument into the form shown by exhibit "B," before you constructed instrument "C?"

A. Yes, sir; I think so, but I don't remember exactly when it was; I think it was before.

Cross-Q. 1233. Have you any doubt about its being before?

A. I don't know that I have any doubts, but it would appear to me that I had omitted the string because when I constructed instrument "C," I didn't have any string connected with that one; I am positive that I had no string connected with instrument "C."

Cross-Q. 1234. Did you make any changes in the electro magnets on instrument "B," after you constructed instrument "C," and if so, how many times did you change it?

A. I don't think I did; I don't remember now of making changes after that.

Cross-Q. 1235. Did you continue to use instrument "B," after you had constructed instrument "C," and if so, how much and how long?

A. I don't remember that I used it; I may have used it some; I often showed it to parties, after I had those other instruments; how much I used it I don't remember.

Cross-Q. 1236. Will you mention the latest time when you remember using instrument "B?"

A. That would be a little hard for me to do; I don't remember; I may have used it in the way of showing it to parties, after I had better ones; I don't remember the last time; I may have used it—spoke through it—after I had other ones, to show the manner of the ones I had at an earlier period.

Cross-Q. 1237. In your answer to the 188th direct interrogatory, you say that you got better results with the instrument "C," when you used it with the tumbler instrument as the transmitter, than you had with any former receiver; (the former receivers being, as I understand it, exhibit "B" and the instrument which was used with a string); will you give me some idea how much better instrument "C" was than instrument "B," as a receiver?

A. I got louder results; that is, it was louder, because that was currents produced by the battery, and sometimes I had used magneto transmitters. When using magneto transmitters, they were not as loud.

Cross-Q. 1238. The 188th interrogatory inquired only what results you got with the tumbler instrument, which I understand is "F," and the instrument "C" as a receiver; now give me some idea how much louder or better, in any way, the results were, which you got with instrument "C," when used in connection with instrument "F," than you got when you used instrument "B" in connection with instrument "F?"

A. I couldn't tell you how much louder, but the results were better with "C;" I couldn't give any idea how much the difference was.

Cross-Q. 1239. Can you state whether the results with "C" were very much, or decidedly better than you got with "B?"

A. They were better, but, as I said before, I can't tell how much better; as near as I can remember now,—it has been a good while ago,—they may have been considerably better.

Cross-Q. 1240. Did you consider instrument "C" to be an improvement upon instrument "B," as a receiver?

A. I think so; it was made for that intention; I know it was better.

Cross-Q. 1241. What kind of a battery did you use, when using "F" and "B" together, and "F" and "C" together?

A. At some times I have used a small Daniell battery—a casing of copper with a porous cell; but the first batteries that I used were the old sulphate of copper batteries. Then I had used another battery, the Callaud battery, with a copper plate in the bottom of the vessel, and some inches above that, a zinc ring. It was one of those batteries. In using "C" I may have used the Callaud battery, but in the first experiments that I had, I know I used none but the sulphate of copper battery.

Cross-Q. 1242. When you used "F" and "B" together, I wish to know whether you used the so-called sulphate of copper battery, or a Daniell's battery?

A. I don't remember. I may have used both. When I first made my experiments, I had none but a sulphate of copper battery. Some years after that, I made a Daniell battery. I don't know what time exactly I made that.

Cross-Q. 1243. What were the dimensions of the sulphate of copper battery, and also of the Daniell battery, which you made?

A. The sulphate of copper battery--I will get at as near as I can the size of the vessel—was perhaps six inches long, and perhaps three or four inches in diameter. The zinc cylinder was, perhaps, two inches on the outside. That was connected at the top to a wooden support that insulated the zinc from the copper, and did not allow the lower end to come in contact with the bottom of the copper vessel. The Daniell battery had a copper vessel about four inches high and about three inches in diameter, with a flaring top. The vessel at the top was perforated with holes, above the flange; within that was a porous cell about four inches long, an inch and a half, perhaps, in diameter, in which was a zinc rod about six inches long. In the outer cell was a solution of sulphate of copper, kept up by crystals at the top of the cell, within the flaring mouth. Within the porous cell was a solution of sulphuric acid and water. A screw cup was attached to the copper vessel for the reception of a conducting wire, and a conducting wire to the zinc rod.

Cross-Q. 1244. Will you state now, to the best of your recollection, whether you used the Daniell's cell when using "F" and "B"?

A. I may have, but I don't remember just at what time.

Cross-Q. 1245. You say you may have. Do you mean by that to express a doubt as to having used a Daniell's cell in connection with "F" and "B"?

A. I may have; that is, at the latter portion, but I did not at the earlier experiments. I don't remember exactly when I got the Daniell's battery. I know I had used it in connection with some experiments, but just at what time I don't remember. I used other batteries. I may have used a Callaud battery.

Cross-Q. 1246. I wish you now to reflect, and not answer any question till you have reflected, and then tell me whether, or not, according to your best recollection, you did use the Daniell's battery, which you have described, in connection with "F" and "B"?

A. What is the use for me to reflect? I know if I reflected a month I couldn't get it any closer; I may have; it is very likely I did; what I meant by that is, I couldn't say positively and wouldn't like to state it.

Cross-Q. 1247. Do you recollect using "F" and "B" in connection with the sulphate of copper battery, which you have described?

A. Yes, sir; because that was the first battery I ever used. For that reason I am positive of that.

Cross-Q. 1248. Did you use it before you moved into the shop which you now occupy?

A. Yes, sir; for there is where I made the first battery that I remember of making; that is, in the shop in the lower part of the house I now live in.

Cross-Q. 1249. Do you remember using that sulphate of copper battery after you moved into the shop where you now are?

A. Yes, sir.

Cross-Q. 1250. How long, after you moved into that shop, did you continue to use that battery?

A. That I can't say. I couldn't give it. I might say one or two years, or perhaps three years.

Cross-Q. 1251. Do you think you used the sulphate of copper battery in connection with "F" and "B"?

A. Yes; I am sure I did.

Cross-Q. 1252. Did you use it in connection with "F" and "C"?

A. I don't remember, because that was made at a later time. I would rather think that I had used then a Daniell's battery, or I might have used a Callaud battery. I do not know how long I used these batteries, only I am positive of using, at my first experiments, a sulphate of copper battery.

Cross-Q. 1253. Will you give the dimensions of the Callaud battery?

A. It was made generally out of a part of a glass fruit jar—that is, I cut off the upper end of a glass fruit jar—about four inches in diameter and six or seven inches high, with a copper plate a little less than the inside diameter of the jar, placed in the bottom. To that was connected a conducting wire at the centre of the copper plate, and it passed out at the top of the jar. At the top I generally used three metallic brackets that hooped over the top of the jar. On the inside of the projecting parts of the brackets rested a zinc ring with a conducting wire running from the zinc ring out of the top of the jar. I had crystals of sulphate of copper placed on the copper plate, and water sufficient to cover the top of the zinc ring.

Cross-Q. 1254. Did you use any other batteries except the three which you have described?

A. I may have made some other modifications, but that is more later. I at one time made a small Grove battery.

Cross-Q. 1255. Did you commence using the Callaud battery after you had used the Daniell's battery?

A. Yes, sir.

Cross-Q. 1256. How long do you think you used the Daniell's battery before you used the Callaud battery?

A. That I can't say—how long I used either of the batteries. I may have used both kinds at the same time; because, in experimenting, sometimes, you think one battery is better than another. I know sometimes I thought the Daniell battery was better than the Callaud, and at other time I thought the Callaud was better.

Cross-Q. 1257. Do you remember using "F" and "B" with the Callaud battery?

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A. I don't remember. I may have. If I would remember I would say. I am sure of that.

Cross-Q. 1258. Do you remember using it with "F" and "C?"

A. I don't remember that. It would be more likely that I would have, because that was later, and that was a later battery.

Cross-Q. 1259. When using either of these three batteries, with either "F" and "B," or "F" and "C," did you use more than one cell at a time?

A. I don't remember of using more than one cell. I think, only one cell.

Cross-Q. 1260. How long is it since "F" and "B" have been in their present condition?

A. It has been a good while—quite a while—a number of years.

Cross-Q. 1261. Jacob Hawn, one of the witnesses produced by the defendants, speaks of seeing "F" and "B" (page 279 [267]) before May 27, 1872, and on page 282, [270] in answer to interrogatory 40, he says he thinks the instruments were then in about the same condition that they are now. What is your recollection as to their being, prior to May, 1872, in the same condition that they are now?

A. My idea has been that they might have been in a condition that they could be worked. I ain't sure. The instruments, at one time, I know, after I had quit using them, had been carried to the garret, or loft, of the shop. We then brought them down again, afterwards. They had been in a condition to work, until the mice had eaten the membrane out of the tin can "B." I don't know exactly what time that was.

Cross-Q. 1262. About what time was it, to the best of your recollection, when the instruments "F" and "B" were carried to the garret or loft?

A. That was about the time that I had made "C," or after that. I should suppose, about 1872, 3, or 4. Somewheres about that time. They were brought down again afterwards, for I know, even later than that, I showed them in connection with other apparatus.

Cross-Q. 1263. When were they brought down?

A. That was some time after they were taken up. I don't remember what years.

Cross-Q. 1264. To the best of your recollection, how long after they were carried up, was it, before they were brought down?

A. They might have been up six months, perhaps less, or perhaps more. I don't know.

Cross-Q. 1265. What was the occasion of their being brought down?

A. It might have been that I wanted to show them to some parties, as I know I did show them. That I wanted to show them how the first construction of the instrument was. That instrument may have been with some other ones—may have been taken on the garret several times. I think so. I think it was taken back and forward several times.

Cross-Q. 1266. You said that they were carried into the garret after you had quit using them, and you spoke of the membrane as being destroyed by the mice. Did you ever fit them up again for use, after you first quit using them?

A. I don't remember that I did. I remember of making changes of different membranes on that instrument, and on other instruments.

Cross-Q. 1267. Were those changes made while you were using them, or after you had quit using them?

A. The changes were made while I was using them—trying different kinds of membrane.

Cross-Q. 1268. Mr. Rufus K. Shireman, a witness called by the defendants, on page 271, [259–60] speaks of seeing instruments "B" and "F" in the fall of the year, not less than eight years ago, and on pages 275 and 276, [264,] he says, that all the difference he saw between the present condition of those instruments, and their condition when he first saw them was, that they were coated considerably better on the inside than they now are. Is it your recollection, that at that time, not less than eight years ago last summer, the condition of the instruments was such as he has described?

A. My idea was, that they had been used some since, but then I know the coating was better. The coating has been destroyed quite lately, or rather, within a year or two. I would suppose that in 1872 they had been used some. I will tell you what makes me think that, too. Because when I made "C," I used the tumbler on "C," and there was a time—it may have been a year or two—that I used "C" with it occasionally, perhaps not all the time. "C" was made before the wagon was painted, but still I cannot tell when it got into that condition.

Cross-Q. 1269. You have spoken of using bladders for membranes on "F" and "B," and some other materials. What material did you find the best for membranes on "B," and what material did you use most?

A. Bladder I had used the most, for it was most convenient for me to get. I didn't think there was much difference between the different materials. I don't remember that there was any particular difference.

Cross-Q. 1270. Was there any difference between "F" and "B," with reference to the material you used for membranes?

A. No, I didn't think there was. At one time I had used, on the tumbler, a metal plate—of tin.

Cross-Q. 1271. How long would a bladder membrane last on either "B" or "F," provided the mice did not eat it?

A. If the mice wouldn't eat it, it might last twenty years. I have no definite time how long it would last, but I would suppose it would last twenty years.

Cross-Q. 1272. George W. Drawbaugh, one of the witnesses for the Defendants, on page 628, [601,] was asked this question in respect to instrument "B": "Do you recollect what it was closed with?" And he answers: "I was under the impression that it was bladder. He was gathering up all the bladders around the country, at the time, from all the butchers. It was bladder though, I remember of asking him, and he told me that was what it was." Do you remember buying up all the bladders of the butchers, around the country?

A. I have got bladders from different parties, and from the butchers.

Cross-Q. 1273. Did you at any time make an attempt to gather up all the bladders around the country, from all the butchers?

A. Not all about the country, no. I don't know what extent it means, all about the country. There was only one butcher at our place. That is, at one given time. There was a number there at different years, though.

Cross-Q. 1274. How many times did you have to get new membranes for either "F" or "B?"

A. That I can't remember—how often. I had put on different membranes at different times, but the number of times I couldn't tell.

Cross-Q. 1275. You spoke of using, at one time, a tin plate instead of membranes, on instrument "F." When was that?

A. I couldn't tell the period, either, but that was some of the later experiments. That is, it might have been about the time that I made "C," or earlier. My recollection is not very good. Anything that I can remember distinctly, I will state.

Cross-Q. 1276. Which did you find the best on "F," the membrane, or the tin plate?

A. The tin plate, because that would not require so much adjusting —so frequent adjusting.

Cross-Q. 1277. After you had tried the tin plate and found it better did you use membrane on "F"?

A. I don't remember that I did, after that. I would suppose I did not.

Cross-Q. 1278. Did you use a tin plate on "F," when you were using "B" with it?

A. I don't know. I don't remember that I did. I might have, but I ain't positive.

Cross-Q. 1279. Did you use a tin plate on "F," when you were using "C" in connection with it?

A. Yes, sir; I think so. I know I used it in connection with "C."

Adjourned until Feb. 14, 1882, at ten, A. M..

February 14, 1882, *ten,* A. M.

Examination resumed pursuant to adjournment.

Present Mr. Smith and Mr. Storrow for Complainants, and Mr. Hill for Respondents.

Cross-examination of Daniel Drawbaugh by Mr. Smith continued:

Cross Q. 1280. In answering interrogatory 50, you made a sketch of your original cup instrument, which I understand was a tea-cup, and which appears to be represented in the drawing as about the actual size. Do the drawings correctly represent the size of the plates, E and F, at the bottom of the cup, and the distance between them, as you used it?

A. About as near as I remember it. I just made it by guess, or by memory.

Cross-Q. 1281. In answer to interrogatory 61, you mentioned several materials which you used for a low conductor, in this cup instrument, such as clean fine earth, and earth used in combination with plumbago, plumbago alone, and pulverized charcoal. Which of these substances did you find the best?

A. I don't remember exactly. I think the carbon was the best; that is, the charcoal.

Cross-Q. 1282. When you used plumbago, did you use commercial plumbago—pulverized plumbago, such as is bought?

A. It was plumbago—I got it in lumps, rather, and pulverized it.

Cross-Q. 1283. You spoke, in answer to interrogatory 62, of using also in that instrument, finely divided metals. Did you refer to bronze?

A. Yes, sir; I had used it in combination with the other low conductors, too.

Cross-Q. 1284. Can you give me an idea how finely you pulverized the charcoal, bronze, and plumbago, as compared with that commercial bronze?

A. I can't just remember how finely. I pulverized it in a mortar, and made it as fine as I thought would be practical.

Cross-Q. 1285. Do you think you made those substances as fine as bronze?

A. I don't know. They might have been as fine as bronze. Though there is different degrees of fineness of bronze.

Cross-Q. 1286. Did your experiments lead you to give a preference to one of those substances over the other, in your future use of the instruments?

A. I did, yes; that is, in charcoal.

Cross-Q. 1287. How much better did you find charcoal to be than either plumbago or bronze?

A. I don't remember, because I had them in combination, different ways; but I think charcoal was the best, as near as I can remember. That is, I am speaking of the cup instrument. I will state that I may have used coke in that instrument. I don't remember. In making them statements there, I spoke to the best of my recollection.

Cross-Q. 1288. When you came to use the instrument "F" you had, as I understand you, two forms; one where the lower plate was connected, to a single rod, as in the instrument which is now produced, and another where it was used with a stirrup, as shown in reproduced "F." Which of those two forms did you use first?

A. The form with the one rod. I could not say how long. I don't remember.

Cross-Q. After you adopted the second form, did you use the first form again?

A. I don't remember that I did. It may be that I did. There was a number of tops or mouth-pieces. I may have left them attached, I don't remember.

Cross-Q. 1290. I judged, by your answer to the 131st interrogatory, that after you were using instrument "F," you continued your experiments with various materials for a low conductor. You mentioned plumbago alone, plumbago mixed with other materials; that is, with carbon, pulverized charcoal and plumbago—"sometimes I used charcoal alone, at other times, finely divided coke and charcoal mixed; also, pulverized coke alone. I had used bronze; that is, finely divided metals mixed with carbon or coke, and various other materials that I cannot think of." What was the result of your trials with the instrument "F" and the various materials named, as to what was the best one, and what was the best condition in which to use it?

A. As near as I can remember, the coke, and the carbon out of gas retorts—hard carbon. I think them were the best in the tumbler instrument, but I had some good results from the combinations of the different ones. I mean the different combinations of coke and charcoal. I never used it solid in that instrument—finely divided.

Cross-Q. 1291. Did you find any difference between the coke and the carbon out of gas retorts? If so, which was the best?

A. I don't remember, but I judge that the gas retort carbon was the best.

Cross-Q. 1292. Do you think it was decidedly the best, or was there little difference between them?

A. I don't remember. I just think it would be the best. The time is so long that I don't just remember every particular experiment.

Cross-Q. 1293. Did you find that those materials were better the more finely they were pulverized?

A. Yes, sir.

Cross-Q. 1294. In what condition did you get the best results from them as to being moist or dry?

A. After my later experiments, I found that the dry carbons were the best. In the former—in using earth and some of them combinations—a certain degree of moisture was the best.

Cross-Q. 1295. What results did you get with bronze as compared with gas retort carbon or coke?

A. With bronze alone the results were not so good. I don't know that I could get any perceptible results at all with bronze.

Cross-Q. 1296. You had instrument "F" reproduced made under your own direction, did you not?

A. Yes, sir.

Cross-Q. 1297. And it was intended, I understand you, to show the condition in which you used "F" itself when it had the stirrups?

A. Yes, sir.

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Cross-Q. 1298. I see that the cup at the lower end of the stirrup is provided with a powdered substance, which I suppose is intended for the low conductor. Will you tell me what the substance is and who prepared it?

A. It has been spilt a number of times. This may be a latter preparation. I can hardly tell. It may be carbon. There may be plumbago in it, by appearance. I prepared it. I suppose so.

Cross-Q. 1299. Did you prepare it specially for this reproduced instrument, or was it some which you had left over from your former use of "F?"

A. I think it was prepared for this instrument. I think so, to the best of my recollection.

Cross-Q. 1300. Does the reproduced drawing "F" show the depth of the low conductor, about as you used it when you were using "F" with the stirrup?

A. As near as I can remember, about the same.

Cross-Q. 1301. And that is about the same as it is in reproduced "F," is it not?

A. Yes, sir.

Cross-Q. 1302. Did you ever construct a duplicate of instrument "F;" that is, did you make more than one instrument of that kind before your reproduced "F" instrument?

A. I don't remember. I had a number of different mouth-pieces. I don't remember of making more than one, though I made different mouth-pieces. The number I don't remember.

Cross-Q. 1303. After you had ascertained what low conductor gave the best results, could you always get good results in using the instrument, either when you used it in connection with "B" or with "C?"

A. Yes, sir; by properly adjusting it. By letting the instrument stand, sometimes, I had to change the adjustment.

Cross-Q. 1304. Do you mean that you had to adjust the pressure between the plates upon the low conductor?

A. I had to change it, perhaps—sometimes I have more pressure and sometimes less pressure. By handling it roughly, the jar would compress portions and would settle the particles closer, and, perhaps, they would have to be brought down closer. The right pressure I would get by trial; that is, the plates would have to be brought down closer.

Cross-Q. 1305. Did you have to change the low conductors from time to time? I mean the carbon and coke powders.

A. I would change it frequently—very frequently.

Cross-Q. 1306. State your reason.

A. By experimenting—trying different combinations, and also different degrees of fineness of the conductors.

Cross-Q. 1307. I understood you to say that you got the best results from powdered coke and gas carbon, and that the finer you made them the better they were. After you had ascertained these facts, did you use either one or the other of them continuously, and did you find it necessary to change either of them for a fresh supply of the same material?

A. I don't remember that it was necessary to make any changes for a fresh supply. The changes, as near as I can remember, were experiments for different degrees of fineness and different combinations. I didn't find that I needed to change them for a fresh supply. I will tell you what I did do, sometimes. I would lift the plate up and loosen the particles of the conductor and then adjust it again.

Cross-Q. 1308. Did you find the coke and carbon powders give the best results, when they were in a loose condition, in using instrument "F?"

A. That is, when it was necessary to have it at a certain pressure I don't know what that pressure would be, but that I would find out by experimenting or trial.

Cross-Q. 1309. What I wish to know is whether, when you loosened up the powders when they had been pressed for a time, you got better results by thus loosening them?

A. Yes, sir.

Cross-Q. 1310 When you were using "B" and "F" with the membrane diaphragm, in what way did you secure the tension of the diaphragms? How much did you stretch them?

A. In placing on, I would dampen them and stretch them down—let them partly dry and press them down. I got a good tension always—pretty good. Then, the tension on "B" I would modify by a tension spring; that is, the tension was sufficient to be practical, I know.

Cross-Q. 1311. When you had once stretched a membrane on "B," could you then at any time secure the necessary tension by means of the spring you have spoken of, until the membrane was destroyed by the mice?

A. Yes, sir; for the tension spring or bracket, or whatever you may call it—I would loosen the screw and press it up towards the center of the diaphragm, and then tighten the screw again

Cross-Q. 1312. You have spoken of using in instrument "F," for compressing the low conductor, copper plates—silvered Daguereotype plates. Did you find that these were better than the tin plates, such as you used in the cup instrument?

A. Yes, sir; I thought so, because they wouldn't be so likely to corrode, but I had results in either way—from either plan.

Cross-Q. 1313. When the plates were fresh and uncorroded, was there any difference in the results which you got?

A. No, sir.

Cross-Q. 1314. What is the material of the plates now in instrument "F?"

A. Tin plate.

Cross-Q. 1315. In you answers to the 638, 639, 640, and 641 interrogatories, on pages 902 [868] and 903 [869], you described and represented a paper funnel, which you applied to instrument "B" at the same time. Why did you apply that funnel to it, and when was it that you did it?

A. That was at an early time. I tried that, thinking I would get better results by reducing the size of the opening at the can to a smaller compass.

Cross-Q. 1316. What do you mean by an early time? How early was it, and how long did you use the paper funnel?

A. I suppose I had that applied shortly after I first made the can. It was placed on, and taken off, at different times.

Cross-Q. 1317. What did you find the results to be, of using it?

A. As near as I can remember now, I don't think there was much difference.

Cross-Q. 1318. Is the electro-magnet, which is now on instrument "B," one which was on it before you quit using the instrument, and carried it into the attic?

A. I don't remember. I had a number of different magnets on. Most of them, that I had on, were larger than that. I don't remember which one I had on when I carried it to the attic. I don't remember whether it was on before I carried it to the attic. It is very likely there was an electro-magnet on, but which one I don't remember.

Cross-Q. 1319. Do you remember whether or not you used the electro-magnet, which is now on it, before you quit using instrument "B ?"

A. It is very likely that is the electro-magnet.

Cross-Q. 1320. Do you know, whether or not you actually used it, before you quit using the instrument ?

A. It is very likely I did, but I don't remember distinctly.

Cross-Q. 1321. I understand that you used other electro-magnets before you quit using this instrument, which were larger. How many electro magnets did you use before you quit using the instrument, and what were their sizes. How much larger were they than the one now on the instrument, and with what sized electro-magnet did you get the best results ?

A. The number I don't remember; there may have been two, three, or four. I don't remember. They were something larger than that. I could hardly say. Perhaps an inch and a half or an inch and three quarters long—the coils—and perhaps an inch or an inch and a quarter in diameter, as near as I can recollect. I got the best results with the larger ones, and those with the finer quality of wire.

Cross-Q. 1322. Did the larger and better electro-magnets, which you used on " B," have more wire around them than the present electro-magnets have, and was it finer, or coarser ?

A. In some of them it was finer, and I think there was more wire, because they were larger.

Cross-Q. 1323. How came the larger and better electro-magnets to to be taken off from instrument " B, " and the inferior one now on it to be put on ?

A. I can't tell you why. I suppose that one was there for trial, as near as I can remember. The one that is on now would give results. I am confident of that.

Cross-Q. 1324. When was the change made from the larger and better one to the one that is now on the instrument ?

A. During the time that I was experimenting with them. I don't know any particular period. I don't remember.

Cross-Q. 1325. Do you remember making any change in the electro-magnets of instrument " B," after you first carried it into the attic ?

A. I don't remember. I may have. It was carried to the attic more than one time. I don't remember when it was first carried to the attic more than one time. I don't remember when it was first carried to the attic.

Cross-Q. 1326. You had the reproduced instrument "B" made under your direction, did you not?

A. Yes, sir.

Cross-Q. 1327. Did you put on to it such electro-magnets as you had obtained the best results with, when you were using "B?"

A. I think I did, yes. I made a magnet, which I thought was such as I used.

Cross-Q. 1328. Do you mean such an one as gave you the best results?

A. I was instructed to make a reproduced instrument of the original. I made that, and put on an electro-magnet as near the size of the one that is now on the original as I could, because I was instructed that it should be made exactly like that one. Then I cut away the membrane to represent the same eaten off by the mice. Then another one to show it as it was when originally made and used. This one had an electro-magnet which was a little larger than the one now on "B."

[*Counsel for Defendant states, that the instrument last mentioned by the witness is the one which has been put in evidence as exhibit reproduced "B;" the other reproduction mentioned being merely a duplicate of "B," in its present condition, and not put in evidence, but retained for the purpose of use in case of any accidental loss or destruction of the original instrument "B."*]

Cross-Q. 1329. Is the metal diaphragm, which is now on instrument "C," the one which was on it at the time you were painting Sadler's wagon?

A. I think so. I wouldn't be positive.

Cross-Q. 1330. Have you any recollection of making a change in the diaphragm after that time?

A. No, I have no recollection of making a change.

Cross-Q. 1331. Is this diaphragm now in the same condition, as it was when you were experimenting with it, at the time when you painted Sadler's wagon?

A. I don't know. I don't exactly understand the question. It had been in condition to use.

Cross-Q. 1332. It is now somewhat crumpled, and rather loosely attached to the case. Was it in the same condition when you were experimenting with it, and attached to the case in the same way?

A. No, sir; it was secured to the case tighter. I don't remember whether it was crumpled then, or not?

Cross-Q. 1333. In what way was it then secured to the case?

A. By a ring, or that ring. I suppose the same ring.

Cross-Q. 1334. What change has been made in the way in which it is attached to the case, since you experimented with it, at the time of painting Sadler's wagon?

A. I don't know of any changes that were made, in the way of attaching it. It was attached by a ring. I couldn't state it any other way.

Cross-Q. 1335. Am I then to understand that it is attached to the case in the same way now that it was at the time you were painting Sadler's wagon?

A. Yes, sir; only it was more secure. The case may have dried in, or, by moving it pretty often, it might have become somewhat looser.

Cross-Q 1336. Have any changes of any kind been made in this instrument "C," since you painted Sadler's wagon?

A. Not that I can remember of. It may be—that small pin, on the centre of the armature, was placed there since. I thought it was understood that you couldn't use it without having an electro-magnet.

Cross-Q. 1337. How long since were the electro-magnet and the permanent magnet removed from it?

A. I don't know how long.

Cross-Q. 1338. Do the electro-magnets, which are in the reproduced instrument "C," correctly represent the electro-magnet which was on the original instrument, at the time you painted Sadler's wagon?

A. I think they represent them, only I think the other ones were a little larger. That is, longer in the coil.

Cross-Q. 1339. Was this instrument, at any time, carried into the attic, like "B" and "F?"

[*Objected to by Mr. Hill, as assuming that "F" was carried into the attic.*]

A. Not that I remember of.

Cross-Q. 1340. Was "F" carried into the attack at any time?

A I don't remember that "F" was. It may have been.

Cross-Q. 1341. Where was instrument "C" kept, and instrument "F," after "C" was made and used with a transmitter?

A. Different places, that I had tried them in. It was generally in a small room on bench under the desk, and sometimes in the desk—different places; and it may have been placed on shelves, that were in that room—two or three shelves that were fastened to the staircase, that went up to the attic.

Cross-Q. 1342. Do you mean the small room that has been spoken of as the private office?

A. Yes, sir; the small room at the northeast corner of the shop; but it may have been kept at other places in the shop. I don't remember. It was moved to different places in the shop.

Cross-Q. 1343. My previous question also inquired where "F" was kept after "C" was used as a transmitter?

A. I wonld have to make about the same answer. It was kept about the same places—different places.

Cross-Q. 1344. Do you mean that these two instruments "F" and "C" were kept in the place you have described, down to the time you first showed these instruments to Mr. Chellis and Mr Hill?

A. To the best of my recollection. Though, as I said in the other answer that I made, the instrument "C" might have been taken to the garret. I can' remember all the different places.

Cross-Q. 1345. What makes you think it may have been carried to the attic. Have you any recollection of its being carried there?

A. No, I don't have. But I have been in the habit of carrying some of my apparatus there, when not using them.

Cross-Q. 1346. Did you use "C" as a receiver, with any other instrument than "F?"

A. Yes, sir. I used it with "I," and I may have used it with others. I don't remember all the instruments.

Cross-Q. 1347. Will you name all the instruments that you used it with as a transmitter?

A. I used it as transmitter and received through that instrument "I"; also "A;" and I think, with "D" and "E." I ain't positive, though; and maybe others. I don't like to confine myself to any particular one. I don't remember what particular machines or instruments.

Cross-Q. 1348. When using it is a transmitter or when using it as a receiver with "I," or with any other magneto transmitter, did you use a battery with it?

A. No, sir; not with "C," but when using it with "F." I had used a battery, but not when using it with a magneto instrument?

Cross-Q. 1349. When you used "I" as a transmitter with any receiver, did you use a battery with it?

A. No, not with "I."

Recess for dinner until 2 o'clock, P. M.

Feb. 14, 1882, 2, P. M.

Examination resumed pursuant to adjournment.

Present same counsel:

Cross-examination of Daniel Drawbaugh by Mr. Smith continued:

Cross-Q. 1350. You were asked in interrogatory 216, on page 819 [786]: "Are the electro-magnets now in exhibit "I" the same that were formerly used there in the instrument when you were operating it?

A. I think so; that is, in making search for the magnets—there were a number, etc." When was that search made that you refer to?

A. It may be about a year ago, perhaps.

Cross-Q. 1351. What was the occasion of its being made?

A. To hunt for the magnet—to look for the magnet. It had been laying about there. I concluded it was the magnet, then I tried it, and found it fit the instrument. The occasion was to hunt for the missing magnet that had been on the instrument. I had showed it to some parties, maybe Mr. Jacobs, and he asked where the magnet was. I don't remember that. I suppose so. I am confident that that is the magnet that was originally on the instrument.

Cross-Q. 1352. How long had the magnet been out of the instrument at the time you made that search?

A. I don't know. It had been out some time. It may have been a year, perhaps.

Cross-Q. 1353. Why was it taken out?

A. I don't know why. Perhaps it was taken out to use for some other purpose. I don't remember that. I frequently did take out magnets to use for some other purpose—in other instruments.

Cross-Q. 1354. How long was that instrument used before you made a better one to take its place?

A. I don't remember how long. It might have been used a year or two. I don't remember.

Cross-Q. 1355. Where was the instrument kept after you had discontinued its use?

A. It was kept in the shop—different places in the shop; I don't remember the different places. The top part had been found in the garret by Mr. Heiges, who is working at the shop now. He found a mouth-piece. I don't remember what it was. He found one that belonged to that instrument.

(The examiner certifies that there are two mouth-pieces that fit instrument "I.")

The flat one was the last one used. I think the larger one is the one that Mr. Heiges found.

Cross-Q. 1356. When did he find this one in the garret, and how came he to be making search?

A. It may have been—I think it was this winter a year ago, if I am not mistaken. I asked him to make search for different other parts of telephones while I was from home. I was away when the search was made.

Cross-Q. 1357 Did he find other instruments, or parts of instruments? If so, what ones and where did he find them?

A. I don't know. I don't remember of him finding any more than that part.

Cross-Q. 1358. How long after the instrument was first made was it that the flat top piece was made?

A. I don't remember how long. In making those parts, I didn't keep no account of time. I forget the length of time.

Cross-Q. 1359. Did you continue to use this instrument "I" after you made "D" and "E," or "L" and "M?"

A. I don't remember. I may have, and I may not. I may have used it in the way of showing persons coming to the shop.

Cross-Q. 1360. Was this instrument kept in your private office after you constructed the instruments "D" and "E," and "L" and "M?"

A. It may have some part of the time. The instrument, when I first got it to show to Mr. Jacobs, or some parties interested in this suit, was on top of a cupboard that had been put there by the Axle Company.

Cross-Q. 1361. Can you tell any other place in the shop where it was kept after you had experimented, with it and ascertained what it would do, and before it was placed on the cupboard where you found it when Mr. Jacobs inquired about it?

A. When experimenting, I had it in different places in the shop. It may have been in that private room, but I don't remember distinctly. I don't remember, because it had been in different parts of the shop. Those are questions I cannot answer.

Cross-Q. 1362. Did you see this instrument "I" in connection with any other instrument than "C?" If so, with what one?

A. I believe I stated that before. I suppose that I had used it with the glass tumbler "F." After making the modifications, I used it with several others. I am pretty sure—I am confident I did.

Cross-Q. 1363. What others?

A. I couldn't say exactly. I suppose with the small magnetos "D" and "E," and I may have, perhaps, with "C." After making the modification, I could use it as a magneto instrument. I could use it with "C," or I could use it with the small magneto instruments, or any other magneto instruments that I had.

Cross-Q. 1364. What modifications do you refer to in your last answer?

A. In placing to the bottom of the electro-magnet two permanent magnets.

Cross-Q. 1365. In your answer to the 231st interrogatory, page 821 [788-9], referring to exhibit "A," you say: "I thought then it was a pretty good instrument, though it was not as good as that instrument there (including "I" in its modified form, with the permanent magnets;) was not as loud. Will you state how much the difference was in loudness between those two instruments "I" and "A?"

A. I don't know. There was a difference. With the permanent magnets attached to the poles, after the modification, would be considerably better.

Cross-Q. 1366. How much did you use "A" after you ascertained it was not as good as "I," and with what instrument did you use it?

A. I don't know. I used it pretty often in showing,—how much, I can't state. I used that with the tumbler, and with "C," and, I suppose, with "I;" but "A" was not as good an instrument to use with a magneto instrument as it was to use with a battery and a carbon transmitter.

Cross-Q. 1367. What was the difficulty with "A," and why was it inferior to other instruments?

[*Objected to by Mr. Hill, so far as the question assumes that it was inferior, when used in connection with a battery and carbon transmitter.*]

A. Used with a magneto instrument it was not so good. If it had been provided with a permanent magnet at the heel of the electro-magnets, I suppose it would have been as good as any instrument. I thought it was a pretty good instrument when used with a battery and carbon transmitter.

Cross-Q. 1368. Where was this instrument kept during the year after it was completed, down to the time when you made your arrangements with Mr. Chellis and others?

A. In different places in the shop. In the small private room, and in different other parts of the shop. I know it had been in the drawer of a desk that I had in the private room. It had been kept in there sometimes.

Cross-Q. 1369. When was it kept in that drawer?

A. At different times. Sometime I would, likely, put it in there after trying it—showing it. I mean, showing it to parties that come to the shop.

Cross-Q. 1370. Was it kept in that drawer, or in that private room, when the Axle Company were there?

A. Yes, sir; I think so.

Cross-Q. 1371. Where was it kept while the Clock Company was in operation?

A. In the shop, in different places. I had it, perhaps, in that drawer of the desk. I don't remember what places, now.

Cross-Q. 1372. Do you remember of its being kept in any other place than the drawer, or the small private room, when you were not actually using it?

A. It may have been, if I could just think. I had other drawers in the shop. I had drawers in the wood working benches, in the wood shop. It is likely it may have been put in there, just after being used on a bench, but I can't state positively that it was.

Cross-Q. 1373. Did you ever take it away from the shop, to show it to any persons? If so, when and to whom?

A. I have taken different instruments away. I don't just remember particularly what instruments. I had some of the instruments at my house, at different times

Cross Q. 1374. Did you ever bring this instrument "A" into Harrisburg to show it to any parties, before you made your arrangements with Chellis and others? If so, to whom?

A. I don't remember of bringing it over to show to any one. I brought an instrument over to show to Mr. Stees, at one time. I was under the impression that it was one of the magneto instruments, "D" and "E."

Cross-Q. 1375. Did you even take this instrument "A," or any of your other instruments, to the office of the Western Union Telegraph Company, in this city, to show any person there?

A. I don't remember distinctly. I may have, when I brought the instrument to show to Stees. If it was, it was one of those small ones.

Cross-Q. 1376. What is your best recollection as to whether you did or did not take an instrument to the office of the Western Union Telegraph Company?

A. I remember distinctly of showing one to Stees, but I don't remember that I ever brought one and showed it to parties at the Western Union Telegraph Office. Mr. Stees had one of those transmitting boxes—not this one (indicating "H,") but the one marked "J," and the receiver marked "N." He may have shown it to some parties. It was at his place, perhaps, two or three months.

Cross-Q. 1377. Which were the best instruments for receivers, "A," or "D" and "E?"

A. "D" and "E" were the best. They were not the loudest. When used with a battery, "A" was louder; but "D" and "E" were plainer—more distinct.

Cross-Q. 1378. Where were "D" and "E" kept, after they were constructed?

A. Like some of the other machines, in different portions of the shop.

Cross-Q. 1379. Were they kept in the small private room?

A. Yes, sir; part of the time.

Cross-Q. 1380. Was the same true of "L" and "M," and "G" and "O?"

A. All the machines were kept in different portions of the shop; sometimes in the small room, and sometimes in other portions of the shop.

Cross-Q. 1381. In your answer to interrogatory 391, page 858 [825] of the record, you said, that before you went to the Centennial you had heard that somebody else, besides yourself, had invented a speaking telephone, or a telephone. How did you hear that, and how long was it before you went to the Centennial?

A. I don't remember, now, how long it was before. It wasn't long. In the summer of 1876, some person told me, or I may have read it; but I think that some person told me.

Cross-Q. 1382. What did you hear or read about it?

A. That some other party had gotten up a telephone, and had it on exhibition at the Centennial.

Cross-Q. 1383. Have you no idea who the party was, or where you read it, if you read it?

A. I suppose that when I was told I heard it, but I don't remember. I don't remember names very well.

Cross-Q. 1384. My inquiry was, who the party was who told you about it, if it was a party that told you, or where you read it, if you read it? Have you any idea where you obtained that information?

A. Indeed I have not. I had read different papers—I often do—but what paper, I don't remember.

Cross-Q. 1385. What papers were you accustomed to read?

A. I was a subscriber of a county paper—a paper published in Carlisle—the *American Volunteer*—for six or seven years.

Cross-Q. 1386. Was that the only paper you were accustomed to read at that time?

A. That was the only paper I was a subscriber to. I would pick up other papers when I would be where I had access to them.

Cross-Q. 1387. When and how did you next learn anything about any telephones made by other parties?

A. I can't remember exactly—that is, when they were putting up telephones through the country. I suppose, here in Harrisburg.

Cross-Q. 1388. Did you learn anything about them before they commenced putting them up in Harrisburg, or read any description of them?

A. I don't remember that I did. I may have, but I don't remember.

Cross-Q. 1389. Do you remember reading anything about them in Harrisburg papers about the time or before they were put into use here?

A. No, sir. I don't remember. I may have, but I don't often read a Harrisburg paper.

Cross-Q. 1390. When did you first see speaking telephones in use in Harrisburg, or in any other place?

A. I can't hardly state that. I suppose, a short time after they were introduced. I saw them first at Harrisburg.

Cross-Q. 1391. Where in Harrisburg did you see them and what kind of instruments were they?

A. I don't remember the name. I think it was the "Phelps"—an oval shaped magneto instrument with the mouth-piece at the end. I saw it at Stees' office.

Cross-Q. 1392. Where else did you see telephones in Harrisburg after that, within the following year?

A. At a good many different places; in a good many different business houses.

AMERICAN BELL TELE

Cross-Q. 1393. At what time was it that you first saw Phelps' instrument at Stees'?

A. I don't distinctly remember the year, but I think it was in 1878, I think so—1878 or 1879. I wouldn't be positive about the date.

Cross-Q. 1394. Did you see any other kinds of instruments besides the other Phelps' instrument in use in Harrisburg?

A. Yes, sir. A number of them.

Cross-Q. 1395. What kinds did you see and where did you see them?

A. I guess the Bell instrument—a small box and a receiver—called the Bell telephone. I see them in different places. I see it nearly every evening, when I go to the train, in the Cumberland Valley depot, and there is one at Kelker's hardware store, and a number of places. I understood the question as coming down to the present time. But the year after I saw it at Stees' there was a good many in town. I saw some more oval shaped machines than others. I don't just remember. I seen at the Western Union Telegraph Office, I think, the Blake receiver. I am not sure about the name, but it had a number of permanent magnets attached to the end opposite to the diaphragm; I might say, some four permanent magnets.

Cross-Q. 1396. Was the small box which you spoke of as being a part of the Bell telephone, a trasmitting instrument?

A. Yes, sir.

Cross-Q. 1397. Did you ever see any of the telephones which were in use in the office of the Western Union Telegraph Company?

A. Yes, sir.

Cross-Q. 1398. When did you first see them there and what kind of instruments were they?

A. The first was the instrument I had reference to. I believe they term it the Crown instrument. I thought it was the Blake instrument. I also, at the same time, seen the oval instrument. Mr. Clute was showing them to me. I suppose that was in 1878 or 1879. I don't remember the year exactly.

[*By the words "they term it the Crown instrument," witness refers to conversation here in the room, in which it had been referred to as the Crown instrument.*]

Cross-Q. 1399. When did you first hear of Mr. Bell in connection with the invention of the telephone?

A. I don't know. It was not a great while ago—about 1879 or

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1880. That is, that I now remember the name; I may have heard it before, but didn't remember the name.

Cross-Q. 1400. Did you ever hear Mr. Edison spoken of in connection with the telephone as an inventor? If so, when did you first hear of that, and what did you hear?

A. Yes, sir; I heard that about 1878. I heard that he was the inventor of the phonograph before I knowed of him being the inventor of the telephone.

Cross-Q. 1401. When did you first hear about him as the inventor the telephone, and what did you hear?

A. I don't remember. It may have been in 1878 or 1879. I don't remember. I was told that he invented the telephone.

Cross-Q. 1402. Did you ever see any telephone which was said to be his invention?

A. Yes, sir; at the First National Bank, at Harrisburg.

Cross-Q. 1403. What kind of an instrument was that?

A. There was a projection, or a box with an inclined lid—in desk form—and a curved arm. On the end of that was the transmitter, with a small mouth piece attached to the curved arm.

Cross-Q. 1404. Was the oval Phelps instrument which you first saw marked "Patented," do you remember?

A. I don't remember.

Cross-Q. 1405. Did you make any inquiry to ascertain whether it was a patented instrument or not?

A. I don't remember. I may have.

Cross-Q. 1406. Did you feel any interest whether some one had obtained a patent on the telephone?

A. Yes, sir; I did.

Cross-Q. 1407. Did you make any inquiries of any one to learn whether it was patented or not?

A. I may have. I don't remember.

Cross-Q. 1408. You have spoken of a line, about 100 yards long, which you had extended from your shop down the Yellow Breeches creek. Where did you get the wire for that line?

A. It was wire that I got from parties that had iron fence. Part of it I got from one William Heck. I got wire at another time from William R. Gorgas. I only remember getting it once from Mr. Gorgas.

Cross-Q. 1409. Did you get that wire from Mr. Gorgas personally, or from the man in charge of his farm?

A. I don't remember now. It came from that farm. I think I had spoken to Mr. Gorgas.

Cross-Q. 1410. In your answer to the 164th interrogatory, on page 808 [775], you spoke of another circuit, which extended back of that blacksmith's shop. Did you use your talking machines on any other circuits outside of the shop, except this one down the Yellow Breeches creek, and this one which extended back of the blacksmith's shop?

A. No, sir; only at my own house; that is, the house that I lived in.

Cross-Q. 1411. How long did you keep up the line down the Yellow Breeches creek?

A. Not very long. I had it put up several times. The wire was just temporarily put up.

Cross-Q. 1412. Mr. William Eppley, a witness called for Defendants, testifies to visiting your place during 1873 to 1875, and your showing instruments which you called talking-machines, and, on page 294 [281], he was asked, in interrogatory 10, "What did he tell you about his machine?" and he answered, "He told me that he had tried it on wires that he had strung for several miles on fences or trees, I forget which, to see how far he could carry the sound distinctly, that he was operating on them." Did you tell him that?

A. Yes, sir; I had forgotten that. I had it on a wire fence. I had insulated a number of wires on the fence, back and forward—on a long fence. It was a wire fence, and I arranged those wires. They were fastened to the posts, and midway between some of the posts there were iron wires wrapped to keep them from swinging. Them thin wires I took off and made a continuous line out of the strands, which would make—I do not know whether it would be several miles. It was over a mile, and I suppose it might have been a mile and a half. The wires were suspended between posts, and were stapled to the posts, and midway between each pair of posts there were small thin wires wrapped around the fence wires, and running from top to bottom of the fence to keep them from swinging.

Cross-Q. 1413. Whose fence was that?

A. William Heck's.

Cross-Q. 1414. The next question put to Mr. Eppley was, "Did he say from whom he had procured that wire, or what description it was?" and he answered, "He told me that he had got—still I am not positive—from Mr. Gorgas common fencing wire that he used to use, some years ago. Mr. Gorgas had used it for fencing wire." Did you tell him that you procured wire of Mr. Gorgas?

A. I didn't tell him that. I wouldn't have told him that.

Cross-Q. 1415. Did you tell him anything about procuring wire of Mr. Gorgas?

A. I may have. I don't know what the conversation was. I bought wire from Mr. Gorgas, and I had bought wire from Mr. William Heck.

Cross-Q. 1416. What instruments did you use in connection with that wire fence?

A. I think it was the tumbler instrument and "A." I ain't too positive, though, but I think them was the instruments.

Cross-Q. 1417. Do you remember what results you got?

A. Them results were--I had put the transmitter in the neighborhood of a clock, and passed over this line. I run a wire from the fence to the shop (it was right above the shop, where this fence was, on the hill north of the shop) and returned one. That experiment was in an evening. It was rather dark—dusk, you might say. I conld hear the of ticking the clock over the line.

Adjourned until February 15, 1882, at 10, A. M.

Feb. 15, 1882, ten, A. M.

Examination resumed pursuant to adjournment.

Present Mr. Smith and Mr. Storrow for Complainants, and Mr. Hill for Respondents.

Cross-examination of Daniel Drawbaugh by Mr. Smith continued.

Cross-Q. 1418. In answer to the 66th and 67th interrogatories you speak of testing the action of the low conductor in instrument "F" by a galvanometer, which showed the different degrees of compression by the vibration of the diaphragm, produced by the sound immediately in front of the diaphragm. Will you describe particularly the way in which you made those experiments or tests, and specify the galvanometer which you used in making the tests?

A. Yes, sir. The instrument would be connected to the galvanometer with a battery in the circuit. Then I would make a sound, musical tone, or mention some words. I noticed that if the galvanometer moved it would indicate a feebler current when producing a sound. In making those experiments I would adjust the transmitter that the circuit would indicate on the galvanometer, about half the strength of the battery current. Then I would produce sounds in front of the diaphragm of the transmitter, and noticed that the needle would indicate a less current—a feebler current. I also made different sounds of different strength. Then I took a hammer and struck a board a foot and a half to two feet away from the transmitter, or about that distance, and I discovered that it produced the same kind of results, only perhaps not so strong. Then I tried the same thing on a magneto-transmitter and sometimes did not see any result at all. I might state here the reason why there would not be any result. In producing the sound on a magneto-transmitter, the current produced by the sounds would not be in the same direction. Every alternate vibration to the right, and to the left would give first a positive, and then a negative current; and then the galvanometer needle would not indicate the current, though sometimes I thought there was feeble results in the galvanometer.

I tried those experiments at difforent times, though I know in my earlier experiments the galvanometer was a very crude affair. The needle was just suspended on a string without a dial.

In the experiments I have described, I did not use an induction coil; By putting an induction coil in the circuit the results were about the same as in the magneto-instruments. When I used the induction coil I put the galvanometer in the secondary circuit.

Cross-Q. 1419. You say in making those experiments, "I would adjust the transmitter that the circuit would indicate on the galvanometer about half the strength of the battery current." Do you mean half the strength which it would have when the transmitter and receiver were moved from the circuit, or half when the transmitter was removed?

A. Half what it was when the transmitter was removed. I did not use a receiver in making those experiments. The galvanometer took the place of the receiver. I had used the galvanometer in the circuit with the transmitter and receiver, but the receiver was not used in these experiments that I have stated here.

Cross-Q. 1420. In making these experiments did you use either of the galvanometers, and if so, which one that you referred to, and was it one of which you made a sketch in the earlier part of your cross-examiuation?

A. I tried experiments at an early time with a crude galvanometer. That is the one I think I made a sketch of. I tried it on other galvanometers, but I can't state the date of these experiments.

Cross-Q. 1421. Can you state how much difference there was in the deflection of the needle when you were making sounds before the diaphragm and when you were not?

A. I can hardly state that. In my first experiments I didn't have a dial—about one-eighth, or one-tenth, of a half revolution; that would be one-sixteenth, or one twentieth of a revolution, as near as I can judge now.

Cross-Q. 1422. What do you mean by a revolution? Do you mean an entire circle?

A. What I mean is one turn of the needle.

Cross-Q. 1423. Do you mean one turn through an entire circle?

A. Yes, sir.

Cross-Q. 1424. In interrogatory 1198 I asked you, "Have you had any means of ascertaining the names of all the parties to whom you sold rams, and the prices which they paid?" You said that some of the bills and accounts of them had been lost, but if you was to reflect over it a while you might. Are you able now to give the names of more parties that you sold rams to and the prices?

A. I have forgotten it. I have not reflected and have forgotten it. If you would read over the parties you have there, I might, maybe, think of others.

Cross-Q. 1425. In your answer to the 197th interrogatory, you mentioned the names of Henry Herr, Mr. Trimmer, William Stephen, John T. Smith and Mr. Brant. Can you now give the names of any other parties?

A. I think I can, of two. Mr. Abraham Fisher, one of the witnesses in this case; George Kissinger. That is all that I can think of. I don't rememember the prices they paid.

Cross-Q. 1426. Have you any means of ascertaining the amount of pipe which you purchased of parties to put in with the rams?

A. I may have. That is, I can get it by looking over some bills. I may get some.

Cross-Q. 1427. Will you look the matter up to-night and ascertain as far as possible?

A. I will. I might state, too, that some of the parties purchased their own pipe. Mr. Stephen purchased his own pipe, or part of it.

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Cross-Q. 1428. Referring again to the subject of the clocks, you stated in your answers to interrogatories 883 to 889, in substance, that before the Grissingers took hold of the business, in 1878, you had built three clocks provided with cases. Two were built with their cases before you went to Mechanicsburg to live; one—in 1877—carried to Mechanicsburg, and another was built after you returned from Mechanicsburg, and before the Grissinger's took hold of the business, this being the one, as I understand it, Johnson Leonard afterwards exhibited. George Drawbaugh, in answer to interrogatory 31, on page 626 [600], says that he was at work for you in 1877, and from the 30th of April to the 22d of June, he built several clock cases, and in answers to interrogatories 83 and 84, he says that before he worked for the Clock Company he built two and altered a third, which you had previously made. Do you think he is correct about the number that he built and altered, or that you may be mistaken about the number of cases that you built before 1877?

A. My impression now is that I built two before I moved to Mechanicsburg. That is, the case of the one I took to Mechanicsburg was built before, or near the time, I moved to Mechanicsburg. That is the one George altered in 1877, or the time he says. I don't remember the time exactly, that he worked for me. It was after I came from Mechanicsburg, he done work on the clocks. I don't remember exactly the number. I don't remember exactly. I know he worked on clock cases, but don't remember the number. I think that the first case I made he helped me on, and that it was made before I moved to Mechanicsburg; and he may have done some work even on the second. When I said that I made them, I did not just think that they were made by me, for I had some one to help me. That is what bothers me—about the number. He helped me to do work. Those two clocks are still at the shop yet.

Cross-Q. 1429. Do you think that George was mistaken in saying that he built, in 1877, two clock cases and altered a third?

A. No, I don't think he was. I think he helped to build two cases; but in 1877—I don't remember the time. It was after I came from Mechanicsburg. I don't remember that it was in 1877, but it is likely that that it was in 1877.

Cross-Q. 1430. If he did build two in 1877, besides altering the one which went to Mechanicsburg, do you think that you built, or had built, two cases before that clock was carried to Mechanicsburg?

A. There were two, including the one I carried to Mechanicsburg.

I think he helped me to make them. I am sure he helped me on one of them.

Cross-Q. 1431. One of the clocks, that he built the case for in 1877, was the Johnson Leonard clock. Now what clock did the other case, of the two that he built in 1877, belong to?

A. I don't remember of any other in 1877. I think the next clock, after the Johnson Leonard clock, was the one that is now in Mr. Jacobs' office. That he helped to build, I know.

Cross-Q. 1432. Mr. Samuel Hertzler, on page 730 [701], gives an account of your coming to him and getting money to enable you and your wife to attend your father's funeral; that he gave you five dollars, as he says, for that purpose. Did your wife attend the funeral with you?

A. No, sir; she intended to, but did not.

Cross-Q. 1433. On page 869 [835], in answer to interrogatory 446, you refer to a settlement with your brother Henry about a distillery. What distillery was that, and what relation or interest had you in it?

A. I had no interest in the distillery. It was a distillery that he had in Perry county.

Cross-Q. 1434. What settlement did you have with him about it, if you had no interest in it?

A. I made drawings or plans that the Government requires on distilleries. That is all I can think of that we had a settlement about.

Cross-Q. 1435. On pages 881 and 882 [847 and 848], you have spoken of circumstances attending the borrowing of some money of David Ditlow. Was he any relative of the Ditlow who has been examined as a witness in this case on behalf of the Defendants?

A. Yes, sir; he is the step-father of David Ditlow.

Cross-Q. 1436. Did you, after the original Faucet Company was formed, do any work for Etter & Shanklin's mill?

A. I did some work, but I don't remember exactly what time it was. It may have been twenty-five or thirty dollars—perhaps more. I don't remember. That amount was all taken out in mill feed, I know, and he told the miller that, after the account was out, he shouldn't give me any more—shouldn't trust me with any.

Cross-Q. 1437. Who was that miller?

A. George Engle, I think.

Cross-Q. 1438. How far is that mill from your shop?

A. Perhaps in the neighborhood of a quarter of a mile, as near as I can judge.

Cross-Q. 1439. After the time referred to in the last interrogatories, did you do any work for Hake's mill? If so, when and how much, or for Ross' mill.

A. I don't remember exactly the time. I did some work for Hake's mill. I don't think I done any work for Ross' mill. The Faucet Company done some work for Ross' mill. I mean Ross' mill at New Cumberland. I don't remember how much work I did at Hake's mill. It wasn't a big amount.

Cross-Q. 1440. Did you, after the period referred to, do any work for any other mills than those mentioned?

A. I may have done some work at the mill at our place there—at the village—I don't remember.

Cross-Q. 1441. Abraham Fisher testifies, on page 718 [689], in answer to interrogatory 13, that he got his ram from you in the latter part of May, 1874. In your testimony, in the interference record between David A. Hauck and Daniel Drawbaugh, I find, on page 65, in answer to cross-interrogatory 140, this statement: "*Here is a sketch of a machine I got up for supplying steam boilers with feed water. I know that is more than four years ago. Here is a memorandum in the same book*, '*A. Fisher, Dr.*, (*dated June* 7, 1873,) $64.90.' *I know the circumstances. I wrote that when I was in a stage coming from York Springs to Mechanicsburg. That is the date.*" Is that "A. Fisher" Abraham Fisher; and if so, what was that $64.90 for, which was due in June, 1873?

A. That was for a ram. That is the Abraham Fisher who testified.

Cross-Q. 1442. He says he got his ram in May, 1874. Did he have another in 1873?

A. No, sir; the ram that he refers to is a ram that I had made the charge, or memorandum, while going in the stage. I don't remember the time, but I went by the date, at that time, that I took down as a memorandum. He may have been mistaken in the date.

Cross-Q. 1443. Mr. Fisher says that he verified the date of May, 1874, by looking at books or memoranda made at the time. If he is correct about that, how is it you happened to charge him in June, 1873, for a ram that he did not have until May, 1874?

A. I don't know. I am confident that I put that in the book while coming down in the stage. I may have made a mistake. I don't know.

Recess for dinner until 2, P. M.

Feb. 15, 1882, 2, P. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Cross-examination of Daniel Drawbaugh by Mr. Smith continued.

Cross-Q. 1444. Did your brother John help to purchase the farm for your father which you have testified about?

A. No, sir; not to the best of my recollection.

Cross-Q. 1445. Did he make an affidavit to be used on the motion for a preliminary injunction in this case?

A. I don't remember.

Cross-Q. 1446. Do you remember talking with him about it?

A. I do not. I may have spoken to him in relation to machines, but I don' remember of speaking to him in relation to an affidavit for that purpose.

Cross-Q. 1447. You say you may have spoken to him about machines. Do you mean that at the time when the affidavits were being prepared you spoke to him about your talking machines?

A. Sometime about the beginning of taking affidavits in this suit. I don't rememner exactly what time though. I was not too sure. It would have been about that time if I had spoke to him.

Cross-Q. 1448. To the best of your recollection did you, or did you not, speak to him on the subject?

A. To the best of my recollection, I don't remember of speaking to him.

Cross-Q. 1449. You understood, I suppose, that my last question related to your talking with him about the talking machines themselves, and does not refer to talking to him about an affidavit?

A. I suppose I talked to him about what he remembered of the machines, but I don't remember when that was.

Cross-Q. 1450. Do you, or do you not, remember that about the time when you were talking with other persons about affidavits, you talked with him about the talking machines and what he knew about them?

A. I may have, but I don't remember. I am positive I don't remember when.

Cross-Q. 1451. Did your brother Henry make an affidavit to be used on that motion?

A. I positively don't know. He may have.

Cross-Q. 1452. Do you know whether he made an affidavit at any time relating to the talking machines?

A. I know that he was a witness in the case, but I don't know whether he made an affidavit before.

Cross-Q. 1453. Do you remember talking with him about that time, either as to making an affidavit or as to what he knew about the talking machines, about the time when you were procuring affidavits from other parties, or shortly before that?

A. I spoke to him in regard to what he knowed about it, but the exact period I don't know. It may have been about the beginning of taking affidavits, or we may have taken his affidavit—I don't remember.

Cross-Q. 1454. You have testified that you made an affidavit in 1880, to be used on a motion for preliminary injunction. Where were you when you made that affidavit, who wrote it, and before whom did you make oath or affirmation to it?

A. I was in Washington—I think so. I would not be too positive. I think Judge Hill wrote it, if I ain't mistaken. I don't remember who it was before—some officer in the same building, I think.

Cross-Q. 1455. Were there any other persons there who made affidavits at that time?

A. Harmon K. Drawbaugh, I think.

Cross-Q. 1456. Can you give me the affidavit to examine which you made at that time?

A. I haven't got them and I can't tell you where they are.

[*Counsel for the Plaintiff asks the counsel for the Defendants to hand the affidavit to the witness for the purpose indicated in the last interrogatory.*]

[*Counsel for Defendant replies that the affidavits are not here in this city, and he does not know whether they are in possession of Defendant or Defendant's counsel, as he, Defendant's counsel, has not seen them for a great many months. But if he had them in possession, he knows of no rule of law or evidence that would entitle the Complainant's counsel to cross-examine upon them.*]

[*Counsel for the Plaintiff requests the counsel for the Defendant, Mr. Hill, who is now present, to ascertain, if possible, in whose possession the affidavit is, and to produce it for the purpose indicated before the close of the examination of the witness*]

[*Counsel for the Defendant, Mr. Hill, replies that so far as he recollects there has never been any affidavit of this witness taken to be used on Complainant's motion for preliminary injunction, nor since the institution of this suit, although there was an affidavit taken prior thereto for another purpose. No affidavit of this witness has ever been filed in this case nor made a part* *of the record thereof, and as the affidavit that was taken is not here and it would involve considerable trouble and delay to get it, and as the Complainant's counsel is not entitled to cross-examine upon it or to require its production, Defendant's counsel declines to take the trouble to procure it.*]

Cross-Q. 1457. In answer to the 373rd interrogatory, you stated that you have made applications for letters patent on your electric speaking telephones, and in answer to the next interrogatory you said that you made your first application for letters patent on the telephone in July, 1880. How many applications have you made on your electric speaking telephones?

A. I don't know how many applications there were. Whether there was more than one in July, or whether they were all combined in one, I ain't prepared to state.

Cross-Q. 1458. My inquiry was not limited to the month of July, 1880, but has reference to all that you have filed, as well as to the one which you first filed in July, 1880. How many applications have you made in all?

A. I don't know how many there were. The drawings and machines were made, and I think I signed the specifications last summer, but I ain't positive if they were filed. I would have to refer to the Company, or Judge Hill to know. Those were after the first applications that were filed. I made two or three improvements since July 1880, in regard to telephones. The drawings of them were made and sent on.

Cross-Q. 1459. Did you make any applications after July, 1880, until last summer?

A. Well, I got up the machine, and the drawings made and the specifications were written in my shop by Mr. Abraham, but don't know whether they were filed or not. If they were, I don't remember. I don't remember. The ones written by Abraham was the ones next to those of July, 1880.

Cross-Q. 1460. Did the ones which are written by Mr. Abraham relate to inventions you have made since July, 1880?

A. Well partly relates to inventions—it relates to an invention called the cone telephone.

Cross-Q. 1461. Did these applications, which were prepared by Mr. Abraham, relate to any of the inventions which are contained in any of the instruments which have been produced in evidence in this case?

A. No, sir.

Cross-Q. 1462. What instruments were described in the application or applications which were made in July, 1880 ?

A. The one that has the bell, "H," I think. I don't remember the different ones. There was different ones there. And, I think, the one that is a little smaller—" J, " I think, with the double carbons, and I think there was some others. I ain't too positive. I don't remember.

Cross-Q. 1463. I ask you now to refer to the drawings representing the instruments which have been produced in evidence, and state in succession whether or not the following instruments were described in that or those applications made in July, 1880: " F " and " B," " C " and " I," " A," " D " and " E," " L " and " M," " G " and " O," " N," " P," and " Q," " H ? "

A. I Don't remember as to " F " and " B." I don't remember whether " C " and " I " were. I don't remember of " A." I don't remember of " D " and " E." (Judge Hill says now that they were.) I don't remember as to " L " and " M." I don't remember as to " G " and " O," though that may have been in connection with the bell instrument "H," or with the one smaller with double carbons "I," I think. I don't remember about " Q" or " P." I remember that " H " and " J " went in, because in writing the specification they asked me a good many questions about them. I remember of other instruments being present at the time the specifications were made.

Cross-Q. 1464. Mr. Peter C. Zimmerman, one of the witnesses called for defendants, on page 437 [418], gives an account of a conversation with you at one time, as follows: " The remark was this, that he heard Mr. Samuel Hertzler's daughter play on the organ, probably a quarter of a mile from his place of residence. Whilst she was playing the organ, he took notice that there was a sound of a cut-off in that organ, just like a ' tap, tap, tap,'—a cut-off in that sound. Being anxious to know what caused it, he went to Samuel Hertzler's, and found a break in the window glass; being loose, it would jar. From that, he seen what the cause was of that there sound—cutting-off like. Then, he said that that showed him that he was right. That gave him an idea that he was right in his study." Do you remember the circumstances which Mr. Zimmerman refers to.

A. I don't remember.

Cross-Q. 1465. Have you a melodeon or parlor organ in your house ?

A. Yes, sir; an organ.

Cross-Q. 1466. When did you procure it, and of whom?

A. I procured it about three months ago.

Cross-Q. 1467. What did you pay for it, and how?

A. I paid—I most forget the price—I think it was one hundred and eighty dollars. I paid for it partly in cash, and he took another organ that I had. He allowed me thirty or thirty-five dollars. I don't remember the amount—thirty dollars is what he allowed me for the old instrument.

Cross-Q. 1468. When did you purchase the old instrument, and what did you pay for it when it was new?

A. I don't know whether I could give it exactly. It was a short time after I sold an interest to the Faucet Company—the old Company, composed of Gorgas and others. I don't remember the year—1866 or 1867. The price I do not remember.

Cross-Q. 1469. Can't you give me some idea what the price was originally—whether it was a hundred dollars, more or less?

A. It was more, I suppose, more than a hundred dollars, but I don't remember the exact price.

Cross-Q. 1470. Do you think you may have paid $150 for it?

A. I may have, though I think not.

Cross-Q. 1471. Did you buy it before you moved into the house which you purchased about that time?

A. Yes, sir.

Cross-Q. 1472. When you moved to Mechanicsburg, did you purchase any furniture to furnish that house, or did you rely wholly upon what you had previously had?

A. I didn't buy any furniture; no, sir, not to the best of my recollection..

Cross-Q. 1473. When you moved back to Eberly's Mills, did you take all your furniture into the house which you moved into, or did you store some of it elsewhere?

A. I took some of it to the shop—a pair of bedsteads and a secretary in bureau form, which I sold to Mr. Renninger. I took vegetables—potatoes and other things of that kind—in payment for it.

Cross-Q. 1474. When did you move back to Eberly's Mills, and what house did you move into?

A. I moved back in the spring of 1877, to a house immediately in front of the mill, in the village there.

Cross-Q. 1475. How long did you live in that house, and into what house did you move when you left it, if you did leave it?

A. I lived in that house, I think, only one year. I won't be too positive. I may have lived there two years. The next house that I moved into was the house immediately back of the mill, where I now live. That is the same house that I lived in in 1867, before I bought the Eberly's Mills house from Hauck.

Cross-Q. 1476. Have you, during the past few years, had in your possession copies of the Patent Office rules, or of the Patent law, which were issued by the Patent Office?

A. I think so. I have had it already. I don't know whether I have it now.

Cross-Q. 1477. Do you recollect in what year it was published, and whether it embraced both the Patent laws and the rules of the Patent Office?

A. I couldn't state when it was published, but it had the rules and Patent laws. I never read it very particularly.

Cross-Q. 1478. Will you look to-night and ascertain its date of publication, and let me know in the morning?

A. I will if I don't forget it. I sometimes I forget. It is late when I get home. I don't know whether I have it yet.

Cross-Q. 1479. Will you look at the printed copy of the record of the testimony on your behalf in the interference case, between David A. Hauck and Daniel Drawbaugh, which has been heretofore referred to, and which I now hand you, and state whether you were present when the several witnesses testified on your behalf, and whether you procured them to appear as witnesses for you, or any of them?

A. I will make a statement without looking. I was present at the biggest portion of the witnesses, when their evidence was taken. And I was along when we went to see the parties, that were to give in evidence. I will look at, if you wish it. I have no eye glasses with me now. (*Witness is supplied with a pair, after which he looks at the record, and says:*) I was present at part of the evidence of Jacob E. Shettel. I was not present at the evidence of Henry F. Drawbaugh, when he give in his. I wasn't present when Samuel Hertzler give in his. I think I was present when William C. Diven give in his evidence. I wasn't present when William S. Dellinger give in his evidence. I don't think I was present when Jacob Evans gave in his. I may have; I don't know. I think I was present when William Fettrow gave in his evidence. I won't be too positive. I was not present when Henry S. Rupp gave in his evidence. I was present when part of

Abraham Shank's evidence was given in. I ain't positive whether I was present when Daniel Fettrow gave in his evidence. I was present when Ira D. Kahney gave in his evidence. I don't think I was present when J. B. Drawbaugh gave in his evidence. I was present when John C. Smith gave in his evidence. I was present when Dr. John W. Moffit testified. I was present when George Phillips testified. I was present when E. W. Chellis testified. That is the last.

Cross-Q. 1480. Will you look at your own testimony in that record, and say whether or not, according to your best recollection, the statements therein made by you were correct, and whether or not you wish to modify or explain any of them?

[*Objected to by Mr. Hill as incompetent, irrelevant and immaterial, and as new matter not called out by the examination-in-chief, and as matter not between the parties to this suit.*]

A. I think that the answers there made were correct, to the best of my recollection at the time. I don't know that there is anything there that I could wish to modify. I could look over it, but it would take a good while to look over it.

Cross-Q. 1481. I prefer to have you look over it and to take the necessary time for doing so, unless you are perfectly well satisfied to let the matter stand on the answer which you have already given.

[*Same objection.*]

A. I would look over it to-night, after going home, if you will permit me to do so. I have a copy at my shop.

[*Counsel requests him to do so.*]

Cross-Q. 1482. You have spoken of a machine, which you have at your shop, for wrapping or covering wire. Did you make that machine yourself?

A. Yes, sir.

Cross-Q. 1483. State, as nearly as you can, when you made it?

A. It may have been 1869 or 1870, that I made it, and then I made changes—modified it. That was about 1872 to 1874, that I modified it or made changes in it. That is as near as I can remember.

Cross-Q. 1484. Will you give a general description of the machine, as it was after your final changes?

[*Objected to by Mr. Hill as irrelevant and immaterial.*]

A. Yes, sir; as near as I can describe it. It was composed of a wooden frame resting on four feet. The frame or base had two feet, about two feet long and eight or ten inches wide. On the one end of the frame was secured a wooden head projecting up perhaps eight or ten inches, from the bottom or base of the frame. Through said head, near the top, passed an iron tube, about, between a quarter and a half inch in diameter. The tube was perhaps five or six inches long. On that tube was placed a face-wheel of wood, about seven or eight inches in diameter, and about half an inch thick at its edge—somewhat thicker at the hub—the face-wheel: that is, the hub was formed into a hub-pulley for the reception of a cord for driving the face-wheel. On the side of the face-wheel were two metal studs, for reception of two bobbins, which contained the material for covering the wire. On the ends of the studs were placed thumb-screws and tension springs, for giving a proper tension to the bobbins. A little way forward of the face-wheel, immediately in front of the tube, were two wooden feed rollers faced with soft rubber. Those rollers were for the purpose of feeding the wire at a proper speed, when being insulated. Both the face-plate and feed rollers were driven by an iron shaft having pulleys thereon, one for driving the face-plate and another for driving the feed rollers. The pulleys for driving the feed rollers were cone pulleys. The iron shaft above mentioned was driven by a foot treadle. That is about as near as I can describe it.

Cross-Q. 1485. You have described a fire alarm apparatus, which you constructed. What features of that apparatus were your own invention?

[*Same objection.*]

A. The composition that I used was zinc and wood; and in another I used brass and zinc, to produce the vibration or movement, which was caused by the degree of heat. I considered that as my invention. I had never seen or heard of it before.

Cross-Q. 1486. Did you consider your invention to rest in the combination of two different materials, or in the special combination of the particular materials which you used?

[*Same objection.*]

A. It occurred to me that if I used a combination of that kind placed into a room, when the room would come to a certain degree of heat, it would cause this composition to move, and form a circuit with a battery, and an alarm. I got up the apparatus and tried it in the shop. Having not heard of it before, I considered it a new invention.

[*Question re-read to witness.*]

I don't know. I had tried it in two ways. First I tried it in wood and zinc; then in zinc and brass—any two dissimilar metals. That is, any two that would expand and contract different under the same heat, would answer the same purpose.

Adjourned until February 16, 1882, at ten, A. M.

February 16, 1882, ten A. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Cross-examination of Daniel Drawbaugh by Mr. Smith continued:

Cross-Q. 1487. Have you ascertained, since the adjournment, the date of the issue of the copy of the Patent Office laws and rules which you have?

A. Yes, sir; I brought them over. I had to hunt a good deal for them. Patent laws of August, 1876, and the rules, August, 1876. Here is Munn & Co.'s Patent Law Compendium of 1867.

Cross-Q. 1488. Have you, since the adjournment, ascertained any further facts in regard to the purchase of pipe for rams, and as to the persons for whom you put in rams?

A. I have reflected, but I couldn't think of any others. I couldn't get at the prices, though I hadn't as much time last night as I expected. When I got home the neighbors had gathered at my house and had a prayer meeting. They requested me to be present, and I could not decline. I did make search for bills, of which I had a number. I found a few bills, which I have in my pocket. There were some older bills—quite a number of them—but I didn't have time to search sufficiently.

[*By consent, the following copies of said bills are put in evidence, the originals to be produced when called for:*]

"Philadelphia 5 mo, 14, 1878, Mr. Daniel Drawbaugh, Eberly's Mills, Cumberland County, Penna., bought of Morris, Tasker & Co., Limited, (mkd Harrisburg, Pa.)

144 lbs.	1 Bdle ½ Pipe 172,	.07	12.04"

"Philadelphia, 7, 1, 1878, Mr. Daniel Drawbaugh, Eberly's Mills, Cumb. Co., Pa. Bought of Morris, Tasker & Co., Limited. Mkd Marysville, Pa,

2 Bdles ½	"	Pipe 200,	.07	14.00	
165 lbs.		55 per cent. & 2 per cent.		7.82	6.18"
P. R. R.					

"Philadelphia, 11, 14, 1878, Mr. Daniel Drawbaugh, Eberly's Mills, Cumb. Co., Pa. Bought of Morris, Tasker & Co., Limited. Mkd Harrisburg, Pa.

1 Bdle ½ "	Pipe 172	.07	12.04	
144 lbs.	55 per cent.		6.62	5.42
	2 per cent.			.10
				$5.32

Cross-Q. 1489. Do you remember putting in a ram for a man by the name of Harry Neidig?

A. Yes, sir.

Cross-Q. 1490. Do you remember when it was and the price?

A. I don't remember the time nor the price.

Cross-Q. 1491. Where did he live?

A. He lived on the road to Shiremanstown, at a place called Rupp's Spring.

Cross-Q. 1492. Did you put one in for Harry Peters? If so, when and what was the price?

A. I don't remember putting in one for Harry Peters. I don't know a man by that name.

Cross-Q. 1493. Did you put one in for anybody at Oyster's Point?

A. William Stephen; I think I mentioned that. It was at Sporting Hill, abount a mile and a half further up the pike than Oyster's Point.

Cross-Q. 1494. Do you remember putting in a ram for a man by the name of Rupp, one named Scheibley, and one Craig?

A. No, sir; I don't remember putting in one for Rupp. There was one put in for Scheibley, who was Associate Judge in Perry county at one time. The fall of water was not sufficient, and he would not keep it, but the ram was left there and has never been used. I will reflect more about Rupp, but, as now, I don't remember. I can't remember of putting one in for Craig.

Cross-Q. 1495. When did you put in Scheibley's ram, where did you get the pipe for it, and how much did Mr. Scheibley pay you?

A. I can't state when it was. It was a number of years ago. It might have been as far back as 1874, 1875, or a little longer. I think I got the pipe from Morris, Tasker & Co. I won't be positive. I think he paid on the account twenty dollars, to the best of my recollection.

Craig was one man you mentioned—I ain't positive of the name, but there was one put in in Perry county, at Newport. I think Craig was the name. I ain't too positive. Johnson Leonard was along. He had seen these parties before the rams were put in. He was present when I put in the Scheibley ram, and Craig. The amount of that ram I don't remember. I don't think it was paid immediately after the ram was put in. Leonard afterwards made a collection and paid me some.

Cross-Q. 1496. Have you examined farther your deposition in the Interference case, to which your attention was called yesterday?

A. I did. I read part of it. As I mentioned before, it was late when I got home. I read a portion of it, but didn't finish it.

Cross-Q. 1497. Will you complete the reading of it, and then state whether you find any occasion to modify or explain any part of of?

[*Mr. Hill makes the same objection to this question that he made to a similar questian yesterday.*]

A. Yes, sir; I will read it. (*Witness reads the deposition and then says:*) I do not find anything there to modify. It was given, to the best of my recollection, at that time.

[*Counsel for Plaintiffs now offers in evidence the printed copy of the deposition of D. Drawbaugh, from the printed book of evidence, which the witness has examined, to be marked "Interference Record, D. Drawbaugh Deposition."*]

[*Objected to by Hill, as incompetent, irrelevant, and immaterial—a deposition given in a matter between other parties than the parties to this suit, and the contents of which were not referred to in the examination in chief.*]

Cross-Q. 1498. Will you look at the preliminary statement on the first, second, and third pages of the record, which has just been produced, and which purports to be sworn to by you before George Kunkel, N. P., on the 30th day of April, 1879, and state whether or not, according to your present recollection, the statements therein contained are true, and whether you wish to modify or explain them, or any of them?

[*Same objection to said preliminary statement and cross-examination thereon as to said deposition and cross-examination thereon.*]

A. I believe them to be true, and do not wish to modify any of them.

[*Counsel for Plaintiffs now states that he offers in evidence that part of the record entitled a preliminary statement, which has just been shown to the witness. He also offers in evidence the depositions of the remaining witnesses in the* *exhibit, whose names are as follows: Jacob E. Shettel, Henry F. Drawbaugh, Samuel M. Hertzler, William C. Diven, William S. Dellinger, Jacob Evans, William Fettrow, Henry S. Rupp, Abraham B. Shank, Daniel Fettrow, Ira D. Kahney, John B. Drawbaugh, John C. Smith, John W. Moffitt, George W. Phillips, Edgar W. Chellis.]*

[Defendants counsel objects to the introduction of said preliminary statement and the depositions just offered in evidence upon the same grounds mentioned in the objections to the introduction of the deposition of Danel Drawbaugh; and upon the further ground that said printed copies are not properly verified or proved to be accurate copies of the original depositions on file in the Patent Office. And Defendant's counsel gives notice that he shall decline to put his clients to the expense of re-printing this record of 140 *printed pages, which, so far as he can see, has no possible relevancy to this case.]*

Recess for dinner until 2 o'clock, P. M.

February 16, 1882.

Examination resumed pursuant to adjournment.

Present same counsel.

Cross-examination of Daniel Drawbaugh by Mr. Storrow continued:

Cross-Q. 1499. I notice that the copy of Munn & Co.'s circular, which you have produced, bears date 1867. How long have you had it in your possession?

A. I don't know. I don't remember how long—a number of years. The number I couldn't state.

Cross-Q. 1500. Will you give this copy to the examiner, to be marked as an exhibit in this case?

A. Oh, yes; I have no objections

[Circular now produced, marked "Exhibit Munn & Co.'s Circular."]

[Objected to by Mr. Hill as immaterial and irrelevant, and the same notice is given as to printing, as was before given with reference to the interference depositions.]

Cross-Q. 1501. Have you in your possession copies of the specifications and drawings used in the applications for patents in telephones, that you made in July, 1880? If, so, will you produce them as exhibits in this case?

A. I ain't certain that I have the copies of specifications, I have the drawings; I think—I know I have, and I can bring them in the morning, if necessary.

[*Mr. Smith requests the witness to produce such copies, as he has, to-morrow morning.*]

[*Defendant's counsel objects to the introduction of such applications or copies thereof in this cause, and states that, subject to the orders of the Court, he declines to permit their introduction and use, for the reason that said applications are on file in the Patent Office, and, by the statute, and rules of practice of the Patent Office, are ex parte matters not accessible to the public; and for the further reason that, if produced, they would be immaterial to this cause, and that they cannot properly be called for in cross-examination, because not a subject of the examination-in-chief.*]

[*Counsel for Plaintiffs now requests the counsel for the Defendants to produce copies of the specifications and drawings of the applications for letters patent on the witness' electric speaking telephones, referred to in the* 373*rd and* 374*th direct interrogatories, on pages* 856 *and* 857, [823] *of the record, or to give the counsel for the Plaintiff's certified copies of the same, or an order upon the Commissioner of Patents to furnish them with such copies at the expense of the Plaintiffs.*]

[*Defendant's counsel replies that he has not put in evidence said applications, nor proof of their contents, nor examined the witness, except as to the bare fact that he made applications in July,* 1880*; that, when he asked the witness those two questions, Complainant's counsel objected to both interrogatories as immaterial, which objection the Defendant's counsel then considered, and now considers, good; and Defendant's counsel, subject as before stated, to the order of the Court, declines to allow the cross-examination to take so wide a latitude as to require the production of papers which are in the secret archives of the Patent Office, and which, if produced and published in this cause, would possibly invite the filing of contesting applications and result in interference and additional litigation; besides unnecessarily prolonging the taking of testimony here and increasing the expenses.*]

[*Counsel for the Plaintiffs further requests counsel for the Defendants to procure copies of the specifications and drawings of the applications filed in the Patent Office, for letters patent on the inventions of Daniel* Drawbaugh, *referred to in the* 14*th section of the answer of The People's Telephone Company, in this cause, on page* 9 *of the Defendant's record, or to give them certified copies of the same, or an order on the Commissioner of Patents to furnish them with such copies at the expense of Plaintiffs.*]

[*Defendants' counsel replies that he will take the request into consideration, and give Complainant's counsel an answer to it, in time for the Complainant's connsel, if the request shall be granted, to put said specifications and* *drawings, or copies thereof, in evidence, during the taking of Complainant's rebutting evidence, or prior to the close of the taking of testimony in this cause; but Defendant's counsel declines to produce, or put said papers in evidence, for the pnrposes of this cross-examination, for the reasons above given; and Defendant's counsel further says that he has no copies of said papers, and would would be obliged to apply to the Patent Office for them, except that he may have, possibly, at his office in Chicago, photo-lithographs of the drawings, or some of them.*]

Cross-Q. 1502. Mr. Edgar W. Chellis, a witness who has been produced on behalf of the Defendants, testifies that you showed him various talking machines in the year 1879. At the time when you first showed him any of your machines, did you show him all which you had made before that time?

A. I don't remember. He seen apparatus standing there in the shop, and I suppose I showed him some, but I don't remember which I showed him. He may have seen them all.

Cross-Q. 1503. At the time Mr. Chellis commenced going to your shop, and for a year or two previous to that time, where were the various talking machines kept which you had made before that time?

A. In various parts of the shop. In the small private room some of them were kept. Some were in the wood working room, and some of the machines were in the room we termed the clock-room.

Cross-Q. 1504. Which of the machines were kept in the clock-room before Mr. Chellis commenced going to your shop?

A. I don't know whether I can know them, unless I see the drawings. There were various machines there, and sometimes they weren't there all the time. (*Witness looks over the drawings, and says:*) Instruments "G" and "H" was there, sometimes, and "P" and "J," and different other ones. Likely, nearly all had been there part of the time, or sometimes.

Cross-Q. 1505. Did you have to make any special search for any of these instruments, which have been produced in evidence, or any parts of them, at the time you first showed them to Mr. Chellis, or to the counsel, Mr. Hill and Mr. Jacobs?

A. I don't remember that I did. I think not. But afterwards I made search for different parts. I don't suppose they seen all the different machines; that is, complete.

Cross-Q. 1506. When did you afterwards make the search and when

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did they first see all the machines complete as they have been produced in evidence?

A. I couldn't state the time. That is, the dates I can't give. I don't remember that I made a search to show those gentlemen the machines. The search was made for parts of machines, about the time the suit pended.

Cross-Q. 1507. You mentioned previously a machine which the Clock Company procured for winding coils of electro-magnets. Did you make that machine?

A. No, sir.

Cross-Q. 1508. Where was it procured and what kind of a machine was it—give a description.

A. It was procured in Philadelphia. The dealer it was procured from I don't remember the name of. I could ascertain that, too, if it is necessary. It was termed a small engine lathe.

Cross-Q. 1509. Was it used for other purposes than winding coils, and if so, for what purpose?

A. Yes, sir. It was adapted for all manner of small turning—brass or iron and metals of different kinds.

Cross-Q. 1510. Who made the various reproduced instruments, which have been produced in evidence, and when were they made?

A. I made some, and my brother, J. B. Drawbaugh, made some. Some of them were made during this last summer, and some of them were made a year, or a little over a year ago, as near as I can remember.

Cross-Q. 1511. Did George Drawbaugh do any work on them?

A. I think perhaps he did, on some of them.

Cross-Q. 1512. In your answer to the 365th interrogatory, you speak of showing M. W. Jacobs instrument "K" in the spring or summer of 1879. When did you first show him any of the instruments which have been produced in evidence, and how many of them did you show to him in the spring or summer of that year?

A. I showed him instruments at the time that Hauck interference suit was pending, or prior to the time of taking testimony in that suit. I hadn't remembered the time. I had referred to Mr. Jacobs for the time. I had forgotten the time.

Cross-Q. 1513. What work were you doing on talking machines in the winter, spring and summer of 1879. What instruments were you working on, if any?

A. I don't remember just what ones—different ones. One was termed, that I was experimenting on—that is, I termed it—the cone transmitter.

Cross-Q. 1514. That instrument has not been put in evidence, has it?

A. No, sir.

Cross-Q. 1515. Can you mention any other instrument which you were at work on during that time?

A. That one that is a frictional machine, I worked on. I don't remember distinctly the time. That may have been before or after that time. I would often take up those machines, after they were made, at different times, and try them—experiment with them. I was nearly constantly working at some of those different instruments.

Cross-Q. 1516. Do you remember a visit which James P. Matthews made to your shop in April, 1878, the editor of the *Baltimore American?*

A. I hadn't remembered the name. There was an editor visited my shop. I don't remember the time, but it was about that time, as near as I can judge.

Cross-Q. 1517. Did you afterwards receive one or more copies of the *Baltimore American* containg an article which he wrote relative to his visit?

A. I don't remember of receiving a copy of the paper. He sent me a slip of some paper—I don't remember what paper it was—containing an account of the visit—a column or a column and a half. He may have sent me a paper, but if he did I have forgotten it.

Cross-Q. 1518. Will you look at an article purporting to be from the *Baltimore American* of November 28, 1878, on pages 99, 100, 101, and 102, of the printed record of the Plaintiff's evidence, filed on the motion for an injunction in this case, and state whether or not you remember that, as the article that Mr. Matthews sent you?

[*Witness reads the article.*]

A. I think that is the article, as near as I can remember. I remember of reading an article of that kind.

Cross-Q. 1519. Will you say, whether or not, according to the best of your recollection, the statements in that article, relating to the interview, are correct?

A. They are not correct, no. The description, I see there, of the clock isn't according to the plan of the clock. I don't say that he intentionally give a wrong description, but I don't think he understood it properly; and in describing a telephone—I showed him a telephone—he got the idea of a telephone that worked by a musical scale and alphabet. I never had anything of that description. I am confident of that. I think he was confused with some of the different apparatus. I may have shown him an alphabetical telegraph, and that, perhaps, he had confused with some other apparatus. In describing a clock, he speaks of a permanent magnet fastened to the back or wall of the clock, and that the electro-magnet was suspended at right angles to the permanent magnet. That was not the case. The electro-magnet was fastened to the back of the clock, and the poles of the permanent magnet were exactly opposite. They were not at right angles. It would not produce any motion arranged in that way. The permanent magnet was secured to the pendulum—and were not at right angles—that is, the poles of the permanent magnet and electro-magnet were facing or opposite each other.

Cross-Q. 1520. Have you mentioned all the statements which you think are incorrect in the article?

[*Witness reads the article again.*]

A. It is wrong in one particular here again. I will just read:

"The pendulum receives an impulse at each stroke, which keeps up a continuous motion, and this impulse is derived from the alternate attraction and repulsion of two magnets, and the existence of 'a neutral line,' at which the one pole loses its power and the other begins to act."

That is not the case. In that clock the two poles—that is, all the poles—lose their power at a certain portion of the stroke. That is, one pole could not lose its power and not the other. That would not be correct there. I will again read:

"The wires attached to the poles of this magnet are not in sight, but they run down to the ground, each terminating in a copper plate, about two feet below the surface; thus the earth becomes the battery that feeds the electro-magnet."

They do not terminate in two copper plates. It is a copper and a zinc. It would not become a battery, with two copper plates.

There is another mistake here:

"He has patented several useful agricultural and mechanical machines."

I have never patented any agricultural machine.

I will mention, I do not like to criticize too much. I don't think it is quite just. It was a friendly visit, and I think he was ignorant of some of those expressions here.

Cross-Q. 1521. I wish you to mention all the statements, which you think are erroneous, whether you think it just to do so, or not. If there are any other statements, which you think are erroneous, please point them out?

A. Here is, I suppose, a little mistake. I don't suppose it was intentional either.

"He never expected to send articulate sound over a magnetized wire."

That would be erroneous there. That is all.

Cross-Q. 1522. What telephone did you show him while he was at your shop?

A. I don't remember. If I remember rightly, he was more interested in the clock. He didn't stay long, to the best of my recollection. He may have been there in the neighborhood of an hour. I remember of speaking to him about the clock, but I don't remember of speaking to him about any other instrument.

Cross-Q. 1523. Will you now read the affidavit of Mr. Matthews, on pages 97 and 98 of the record I previously referred to, and state whether or not the statements in that, with respect to what you told him, are correct or not, and point out any errors you may think you discover in such statements?

[*Defendant's counsel objects to this evident effort to force upon the record, as a part of the evidence in this case, the ex parte affidavit of a person whom the Defendants have had no opportunity to cross-examine, and objects to the introduction of the affidavit as incompetent and hearsay; and objects to the attempt to establish it, or any part of it, by any evidence except that of Mr. Matthews himself, duly called and examined for the purpose.*]

A. I won't say as to the statements—portions of it may be correct. The affidavit says: "He showed me two hollow hemispheres, which constituted a part of the apparatus."

Now, I am confident I never had any instruments got up in that way. I am perfectly positive. I didn't have instruments constructed in that way. I may have shown telephones. I don't remember of speaking on the subject of telephones. I don't remember.

He further states here:

"There was no telephone on his premises at that time, as far as I could see, and he made no mention of having any such instrument, except the detached pieces above mentioned.

He said that the idea of transmitting sounds in this manner was not new, and that he had, some years before, read of it in a scientific publication translated from the French."

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I had read of an apparatus, that was termed—I didn't know at the time--the "Phonautograph;" that I read of in some publication that was translated from the French. But I don't remember of making the statement. If I did, I have forgotten it. What I mean by translated from the French is, that it was a French invention—invented by some French party.

Cross-Q. 1524. Have you mentioned all the statements referred to in the last question, which you think are incorrect?

A. I don't see why I should have made those statements to him when I knowed at the same time that I had telephone apparatus that numbers of others had seen. I don't see why I would have made that statement. That is what makes me think I didn't make that statement.

Adjourned until February 17, at ten o'clock, A. M.

February 17, 1882, 10, A. M.

Examination resumed, pursuant to adjournment.

Present same counsel.

Cross-examination of Daniel Drawbaugh by Mr. Smith continued:

[*Complainants counsel now offers the examiner the printed sheets, to which the attention of the witness has been called, numbered* 97 *and* 98, *from the printed record of the evidence on the motion for the preliminary injunction in this case, containing the affidavit of James P. Matthews, to be marked "Exhibit Mathews' Affidavit." Also the article from the Baltimore American, to which the attention of the witness has been called, on pages* 99, 100 *and* 101, *of the same record, to be marked "Exhibit Matthews' Article."*]

[*The affidavit and article are severally objected to for the reasons already indicated in the objections of yesterday. And the article is further objected to as entirely secondary in character, it not being an original memorandum of the alleged visit, made at the time thereof, but confessedly written eight months after said visit, and containing the writer's loose impressions remaining after that length of time.*]

Cross-Q. 1525. Do you remember a visit being made to your shop in the spring of 1878 by Dr. John C. Long and Clarence D. Rockafellow?

A. I remember of a visit being made—I didn't remember the time—by Clarence Rockafellow and a gentleman—I didn't remember the name.

Cross-Q. 1526. Will you look at the pages 165 and 166 of the printed record, in the motion for the preliminary injunction already referred to, containing what purports to be an article from the *Independent Journal*, of Mechanicsburg, of the date April 17, 1878, and an affidavit of Mr. Clarence D. Rockafellow, and state whether the article gives a correct account of what you showed to Mr. Rockafellow, and of the information which you gave to him, and whether his statements in his affidavit as to what you said to him are correct or not?

[*Same objection to the affidavit of Rockafellow, and the article referred to therein, as to the affidavit of Matthews, and the article referred to therein. Mr. Hill states that he does not object to the cross-examination of Mr. Drawbaugh as to the matters referred to in said articles and affidavits, so far as they come within the range of the examination-in-chief, but objects to the articles and* EX PARTE *affidavits, or any of them being received as evidence of the alleged facts therein stated.*]

A. I remember of him being there, and that I showed him instruments, but what instruments I don't remember. I know he listened at an instrument while I spoke in a transmitter. I don't remember the nature of the conversation, but that after he had listened he made some remarks and appeared to be perfectly satisfied that the machine was good. I don't doubt I said to him that I was making experiments for the improvement of the apparatus, because I had been, I know, at all the different periods.

[*Mr. Hill reads the following extract from the affidavit and calls the attention of the witness to it:*]

"At that time Mr. Drawbaugh exhibited his telephone to me, on which he claimed to be making experiments, and said that he thought that he had discovered the principles of the telephone prior to Edison, but that he had not as yet made it a mechanical success—and was yet to make improvements on it to make it practicable—a result which he had not yet attained."

Well, I may have said that, because I was working to get louder results. I know I made that remark often, and he appeared to be satisfied with the result—the tenor of his conversation. I don't remember the words.

The remark above referred to as one that I often made was, that I was improving it to get better results.

Cross-Q. 1527. Do you remember whether or not you saw the article which I have shown you on page 165, about the time of its publication, or at any time before the present time?

A. I don't remember at what time. I don't remember of seeing it. There were numerous publications, and I didn't pay much attention to different ones. It is very likely that I did, but the time I don't remember. I mean it is very likely that I seen that publication.

[*Counsel for Plaintiff now offers in evidence the pages* 165 *and* 166, *from the record above referred to, and shown to the witness to be marked "Exhibit Rockafellow Article" and "Exhibit Rockafellow Affidavit."*]

[*Same objection as above indicated.*]

Cross-Q. 1528. Will you look at the affidavit of Theodore Grissinger, on pages 168 and 169, from the printed record of the evidence on the motion for the injunction in this cause, and state whether or not it gives a correct account of the interviews between you, to which it refers, and of what was said?

[*Same objection as to the affidavits of Matthews avd Rockafellow.*]

A. I don't remember any particular conversation. We had a good many on mechanical subjects—about the business and the clock. I know that I felt very reluctant in talking about any other apparatus or machine, except the clock. They were very anxious about the clock business; that is, running that successfully, and I know that I sometimes done work on telephones secretly, that they did not know of, because I judged that they would have complained if they had knowed I had worked on them. We may have had conversations on the telephone, though I never let them out much in that direction. If he had made an inducement that he had been anxious to go into the telephone, I would certainly have shown him and given him satisfaction, I am perfectly sure of that.

[*Counsel for Plaintiff now offers pages* 168 *and* 169, *from the record referred to, containing the affidavit of Theodore Grissinger, to be marked "Exhibit Theodore Grissinger's Affidavit."*]

[*Same objection as to affidavits of Matthews and Rockafellow.*]

Cross-Q. 1529. I now hand you a printed copy of the affidavit of Jacob H. Grissinger, on pages 170 and 171, from the printed record above referred to, and ask you whether or not the account it gives of interviews between you and Mr. Grissinger, and of what you had in operation in your shop while you were connected with him, is correct?

[*Same objection as to the three affidavits already referred to.*]

A. He had visited my shop at a pretty early time, in company with another gentleman, but when they came there they were strangers—I had not knowed them. I had shown him apparatus—clock and different other apparatus, but any particular one I don't remember. Some time last fall, perhaps a year ago—I don't remember the time exactly, but think upon reflection that it was more than a year ago, it might have been last fall a year ago—I met him on the road. He had a ladder. I think he said he was picking apples. I was in a carriage in company with Mr. Jacobs and 'Squire Bowman. We went to get an affidavit from him. He said he had made an affidavit for the opposite party, which he had afterwards seen printed, and it was not according to his statements. The affidavit was not the way he had gave it. He is now dead. He died a month or two, perhaps three, ago. I don't remember that he said he had seen it after it was printed, but he said he had seen it "afterwards."

Cross-Q. 1530. Did he state in what respect the affidavit, which he had subsequently seen, was different from what he had made?

A. I don't remember that he made that statement. I just remember now, that he said it was not as he had given it. Mr. Jacobs and him had the conversation, and he may have stated the difference, but I don't remember that.

Cross-Q. 1531. Who was the gentleman who came with Mr. Grissinger at his first visit?

A. When they come there, they were strangers. They introduced themselves. The one gentleman's name I don't remember. I met the man, after that, several times. I now remember the name. It was Mr. Watts.

[*Counsel for the Plaintiffs' now offer pages* 170 *and* 171, *from the printed record above referred to, which have been shown to the witness, as an exhibit to be marked "Exhibit John H. Grissinger's affidavit."*]

[*Same objection as to the three affidavits above referred to.*]

Cross-Q. 1532. Do you remember a visit being made to your shop, early in 1878, by Mr. Frederick W. Worley and Isaac Lloyd in company?

A. I remember a visit being made to me by Mr. Lloyd, a number of times that he had gentlemen with him, but the names of the gentleman I don't remember, and the time I don't remember. Mr. Lloyd visited me occasionally for quite a while back—a number of years.

Cross-Q. 1533. Will you look at the affidavit of Mr. Worley, printed on pages 172 and 173 of the record above referred to, and state whether you remember the visit of Mr. Worley, which he speaks of, and whether or not his account of what passed between you, and the conversation you had, is correct?

[*Same objection as to the four affidavits above referred to.*]

A. As I stated before, Mr. Lloyd was there frequently and had gentlemen with him, but I don't remember a gentleman by the name of Worley. He may have had that gentleman there, and we may have had conversations on the telephone, but I don't remember that particular conversation. He makes a statement of a kind of a telephone, but I don't remember of having it: "Mr. Drawbaugh stated he was about to render that effect by using a box, or something to which the ear could be applied." I don't understand what he means by that.

[*Counsel for the Plaintiff offers in evidence the affidavit of Mr. Worley, from pages* 172 *and* 173 *of the printed record referred to, which has been shown to the witness, as an exhibit, to be marked "Exhibit Worley Affidavit."*]

[*Same objection as to the four affidavits above referred to.*]

Cross-Q. 1534. Will you look at the affidavit, which I now hand you, of Mr. Isaac Lloyd, on pages 173 and 174 of the printed record above referred to, and state whether you remember the visit, which Mr. Lloyd speaks of in his affidavit, and whether or not his account of what you said to him on that visit is correct?

[*Same objection as to the affidavits above referred to.*]

A. Mr. Lloyd visited my shop frequently, as I said before, in company with different parties, though I couldn't refer to any particular conversation. I don't remember of any particular conversation about the telephone, though I remember of showing him different apparatus, of different kinds, and among them may have been telephones.

[*Plaintiff's counsel now offers in evidence as an exhibit the affidavit of Mr. Lloyd, which has been shown to the witness, on pages* 173 *and* 174 *of the printed record above referred to, to be marked "Exhibit Lloyd Affidavit."*]

[*Same objection as to the affidavits above referred to.*]

Cross-Q. 1535. Mr. Worley and Mr. Lloyd refer, in their affidavits, to an article written by Mr. Worley and published in the *Harrisburg*

Telegraph, Feb. 13, 1878, entitled "The Great Magnetic Clock," and signed "Observers." Do you remember of seeing that article at any time subsequent to its publication? I now hand you a copy of the article, on pages 181 and 182.

[*Same objection.*]

A. I could answer that—there were so many. I don't remember any particular one. (*Witness reads copy*) I may have read it. There were so many different articles published, that I don't remember every article.

Cross-Q. 1536. Will you look at the additional extracts purporting to be from the Harrisburg papers, on pages 181, 182, 183, 184, of the printed record above referred to, which I now hand you, to wit:

One purporting to be from the *Harrisburg Telegraph* of April 18, 1878.

One purporting to be from the *Harrisburg Patriot* of May 7 1878.

One purporting to be from the *Harrisburg Independent* of May 19, 1878.

One purporting to be from the *Harrisburg Patriot* of May 14, 1878.

One purporting to be from the *Harrisburg Independent* of May 15, 1878.

One purporting to be from the *Harrisburg Independent* of May 17, 1878.

State whether or not you remember of reading those articles, or any of them, at the time of their publication, or subsequently?

[*Same objection as to the preceding articles.*]

A. I may have seen the articles. I don't remember.

[*Plaintiff's counsel now offers as an exhibit the extracts from the Harrisburg papers, which have been shown to the witness, on pages* 181, 182, 183 *and* 184, *of the printed record above referred to, to be marked "Exhibits Extracts from Harrisburg Papers."*]

[*Same objection.*]

Cross-Q. 1537. You have spoken of a Mr. Watts, who visited your shop in company with Mr. Jacob H. Grissinger. Did that visit take place about October, 1876, and was that Mr. Watts Mr. William M. Watts, of Shepherdstown?

A. I don't remember when the visit was. I remember the visit

They came there strangers, and introduced themselves. His first name I don't remember.

Cross-Q. 1538. Have you and Mr. Jacobs, or either of you, since visited him, for the purpose of obtaining an affidavit from him to be used in this case, or to get him to testify in the case?

[*Objected to as immaterial, and, so far as any visit of Mr. Jacobs alone is concerned, as calling for hearsay.*]

A. Yes, sir. I called on him, in company with Mr. Jacobs, for an affidavit. He declined giving an affidavit.

Cross-Q. 1539. Did Mr. Watts, at the time of his visit to your shop, say anything to you about having seen an article, or articles, in the *Scientific American*, in regard to transmitting sounds?

A. I don't remember. He may have.

Cross-Q. 1540. Do you remember saying anything to him, or intimating to him, that you had seen such article or articles, and that you had been experimenting?

A. I may have said it. I don't remember. I wasn't a subscriber to the *Scientific American.* I very seldom seen a copy. Them conversations were so very varied and I spoke on so many different subjects that I don't remember any one particular subject.

Cross-Q. 1541. Do you remember whether or not you showed him a tumbler with the bottom broken off, and explained to him that it had a diaphragm of bladder tied on to it, and producing a clock spring, or piece of steel, and trying to explain to him the action of the apparatus by means of the piece of steel?

A. I wouldn't now—in using a clock spring or piece of steel, I couldn't form any connection, why I would use that in explanation. I may have shown the tumbler with the bottom out, and I may have shown him other instruments. I don't remember what instruments I showed him. I never used a clock spring in connection with any telephone instruments that I can remember of.

Cross-Q. 1542. If you showed him a broken tumbler, was it the one which has been produced here as exhibit "F?"

A. It may have been—yes.

Cross-Q. 1543. Do you remember whether you ever met Mr. Watts at any time in Mechanicsburg, and having any talk with him upon the subject of sound?

A. It occurs to me that I met him when I lived in Mechanicsburg.

I think he was going to the Centennial. That was what makes me think that that visit to my shop was at an earlier day than given in the previous question, because; when he came to the shop, that was the first time I knew him. He introduced himself and Grissinger. He made mention that he would like if I would go along with him to the Centennial. That meeting I remember, because I was anxious to go to the Centennial, and I hadn't been there yet, at that time. I don't remember the subject of conversation, except that portion of it. He asked me to go to the Centennial. That portion of it I remember. He may have spoke on the subject of sounds.

Cross-Q. 1544. Do you remember whether you said anything to him about some observations that you made at one time on the vibrations of sounds, while your daughter was playing on some musical instrument?

A. I don't remember of making that, but I remember of making that observation to a number of persons, that a sound would be reproduced on a window pane.

Recess for dinner until 2, P. M.

Feb. 17, 1882, 2, P. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Cross-examination of Daniel Drawbaugh by Mr. Smith continued:

Cross-Q. 1545. You have referred to there being numerous publications in the newspapers. Do you know of any other articles published in the newspapers relating to a clock or other inventions, except those to which I have called your attention. If so, in what papers were the articles published, and when?

A. There may have been others, likely there was. I can't just refer you to any. I don't remember.

Cross-Q. 1546. Have you now any recollection of seeing any other articles except those to which I have called your attention?

A. I have no recollection of seeing any other.

Cross-Q. 1547. In looking into the bottom of exhibit "M" I notice some holes or depressions cut into the wood between the permanent magnets. What were they for?

A. These magnets at one time stood apart—were wider. There was a tube inserted between them, operated by a screw—to compress, or to

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raise that tube. In the tube were carbons in combination with the electro-magnets—in their place. And I think that the magnets were just turned opposite. And them holes were impressions allowing the heads of the screws to clear themselves, that the permanent magnet would rest close to the bottom. I think that was the arrangement. I don't know what else they were for.

Cross-Q. 1548. When the electro-magnets were turned opposite, and separated in the manner you have described, were the permanent magnets now in the instrument, then in it?

A. My experiments were so varied that I sometimes used permanent magnets that were not turned up. And in some of the same cases I put other magnets. They may not be the same permanent magnets.

Cross-Q. 1549. Did you use the same electro-magnets now in the instrument, in the manner you have stated, in the first situations you have described?

A. I think so. To the best of my recollection I did. What makes me think that is, that there is a part of the spool cut away at the inner edges—for the tube between did not have room.

Cross-Q. 1550. I notice that a portion of one of the bills you produced yesterday, of Morris, Tasker & Co., dated 14th day of the 5th month, seems to have been cut away, so as not to show the discount as on the other bills. When and why was that done?

A. I can't tell you. I didn't know it was cut away. That is the first time I knowed it was cut away. I don't know why it was cut away, nor when it was cut away.

Cross-Q. 1551. Will you look at the pages of the printed record, of the evidence on the motion for an injunction in this case, from 103 to 117 inclusive, which I now hand you, purporting to be certified copies of the file-wrappers of various patents granted to Daniel Drawbaugh, and state whether the patents mentioned are those which were granted to you?

A. Yes, sir. They are.

[*Complainants' counsel offers as an exhibit the pages from the record referred to in the last interrogatory, to be marked " Exhibit Drawbaugh Patents."*]

Cross-Q. 1552. Mr. Edgar W. Chellis, a witness called for the Defendants in this case, testifies that, on or about the 6th day of May, 1880, Mr. Hill, Mr. Jacobs, and himself became interested in your telephone inventions to the extent of about one quarter each. What did you then receive, or what were you thereafter to receive, as the consideration for those interests in your invention which you gave to those parties?

[*Objected to as immaterial.*]

A. I think I have a right to decline answering that. It is a private business, which I don't wish to have known.

Cross-Q. 1553. In an assignment, which has been put on record in the Patent Office, from you to Frank A. Klemm, Ernest Marx, Simon Wolf, and Moritz Loth, executed on the 21st day of July, 1880, and which Mr. Chellis says, in answer to the 83d interrogatory, was, he supposes, in effect, to carry out the sale or bargain made by himself and three associates, there is a recital that in consideration of the sum of twenty thousand dollars, paid to you in hand, "the receipt of which is hereby acknowledged," you sold, assigned, and transferred the interests to the parties I have named. Did you, at that time, receive and keep for your own use the sum of twenty thousand dollars?

[*Objected to as irrelevant and immaterial, and as the witness' private business.*]

A. No, sir; I did not.

Cross-Q. 1554. How much was paid at that time, and how much did you keep for your own use?

[*Same objection.*]

A. The amount, if I remember right, was twenty thousand dollars. That is taking advantage. I gave an answer and declined giving the amount. Really, I think it is not just to ask me my private business. I decline giving the amount which I received.

Cross-Q. 1555. Did you receive any other consideration than the twenty thousand dollars, or were you thereafter to receive any further consideration, either in money, or in the stock of any Company, or in any other way?

[*Same objection.*]

A. I didn't receive anything else at that time. I was to receive thereafter, but the amount I decline giving, for the same reason, that I think it is private business.

Cross-Q. 1556. In what way were you to receive it, and have you now received what you were to receive?

[*Same objection.*]

A. I was to receive it in stock, and have received stock.

Cross-Q. 1557. Stock in The People's Telephone Company?

[*Same objection.*]

A. Yes, sir.

Cross-Q. 1558. Have you received all the stock that you were to receive?

[*Same objection.*]

A. Yes, sir.

Cross-Q. 1559. State what amount of stock in The People's Telephone Company you have received, and how much you now hold.

[*Same objection.*]

A. I decline answering, for the same reason.

Cross-Q. 1560–1. The interest which you have in the result of this suit is a matter which concerns the Plaintiff, and it has a right to know what that interest is. I, therefore, repeat the question: What amount of stock have you received of The People's Telephone Company, and how much do you now hold?

[*Objected to on the ground that the Plaintiffs have only the right to know whether or not the witness is interested to a considerable extent in said stock, but have no right to the details.*]

A. I stated before that I received stock, but I decline answering the amount, as I consider it private—the amount.

[*Counsel for the Plaintiff here give notice that they do not waive their right to an answer to the last question, or to any of the preceding questions that the witness has declined to answer; that they now insist upon an answer, and shall insist that the consequences of this refusal shall be borne by the Defendant.*]

Re-direct examination by Mr. Hill:

Q. Q. 1562. You may state whether or not you are interested in said stock to a considerable amount, if you have no objection to answering that question.

A. I have no objection to answering that. I have stock to a considerable amount.

Q. Q. 1563. You may state further, whether the holding of that stock has or has not, in any way, influenced the testimony which you have given, or may give in this case?

A. I don't properly understand that question.

Q. Q. 1564. What I mean is this, whether or not the interest, which you have in the result of this suit, in any way affects the testimony which you as a witness have given, or may give?

A. There is where I don't know how to answer that. I may be dull in that, but I don't know.

Q. Q. 1565. I will try to make it plain. You are a stockholder in The People's Telephone Company. Is your testimony as a witness just the same as it would have been if you had not been a stockholder, or has your interest caused you to give more favorable testimony for the Defendants, than you would have given if you had not been a stockholder. That is what I mean.

A. As a stockholder my evidence is the same as it would have been if I had not been a stockholder. I tried to give in my testimony as near as I knew, in accordance with justice. And I know that I wasn't influenced to make any wrong statements from the interest that I received from the Company.

Q. Q. 1566. You have testified to having in your possession a copy of the Patent Office rules and regulations of 1876. Do you know when you first received that copy?

A. I do not.

Q. Q. 1567. Do you remember whether or not you received it during the progress of the Drawbaugh and Hauck interference, and in connection therewith?

A. No, sir. I don't remember when I received it.

Q. Q. 1568. Do you remember when you received a circular of Munn & Co.?

A. No, sir. But my impression is, that I had that for a number of years. It was lying among a lot of old papers and trash that hadn't been looked over for a great while, I know.

Q. Q. 1569. In what years were you a subscriber for the *Scientific American?*

A. I could hardly state in what years. I hadn't been a subscriber for twelve or fifteen years, until about three or four weeks ago, when I subscribed with a newsdealer here in Harrisburg.

Q. Q. 1570. Do you remember why you let your old subscription run out without renewing it?

A. Yes, sir; for the want of money. At the time it did run out it was for want of money, thinking I would renew it. But it seems I didn't. It was for that reason, I know.

Q. Q. 1571. When Mr. Matthews visited your shop in April, 1878, did he come there at your invitation or procurement ?

A. No, sir. I didn't, though, remember what year. When he came there, he didn't come by invitation.

Q. Q. 1572. Had you been acquainted with him before that ?

A. No, sir.

Q. Q. 1573. Do you know how he happened to come there ?

A. I do not.

Q. Q. 1574. Did he state what he came to see ?

A. I don't remember that he did. He was interested in the clock. He looked at the clock. I remember that fact.

Q. Q. 1575. What were you doing when he came there ?

A. I don't remember what I was doing at the time.

Q. Q. 1576. Was anybody else present during his interview ?

A. I think there was a boy that brought him to the shop, who was present part of the time, at any rate. I don't know whether he was present all the time or not ; and there may have been some one working in the shop, besides myself.

Q. Q. 1577. Do you remember whether the Magnetic Clock Company was in operation at that time at the shop ?

A. I don't remember that, but it seems to me it was before. It seems quite a while since he was there. But I won't be positive whether it was during the time the Clock Company operated, or not ?

Q. Q. 1578. Were you with him all the time while he was in the shop ?

A. I don't remember that. I may have been with him all the time.

Q. Q. 1579. Did he tell you that he was a newspaper man ?

A. I think he did.

Q. Q. 1580. Did he make any notes or memoranda while he was there ?

A. Yes, I remember that. He did.

Q. Q. 1581. Did he read them to you ?

A. No, sir.

Q. Q. 1582. Did you know on what subject the notes or memoranda were made ?

A. I don't know exactly, but he had a memorandum book when he was in front of the clock. He was examining the clock, and he took down some notes.

Q. Q. 1583. Did you have any conversation with him about the clock or motor of Mr. W. W. Gary, of Boston?

A. I don't remember. He spoke of different subjects, but I don't remember that he mentioned Gary or any motor. He may have, but I don't remember.

Q. Q. 1584. Assuming Mr. Matthews' visit to have been in April, 1878, which ones of the several telephone instruments that have been put in evidence here, had been made and operated by you before that time?

A. I will have to look over the drawings. "B" and "A," "C," "D," and "E"—the magnetos—"F," "G," "H," "I." I wouldn't be positive as to the frictional machine, "K." "J" was complete; "L" and "M;" "N;" I wouldn't say positively as to "Q;" "P," I think.

Q. Q. 1585. On what subject was the most of Mr. Matthews' conversation during that visit?

A. As near as I can remember now, on the clock.

Q. Q. 1586. Do you recollect of showing him any other machines of your invention, besides the clock?

A. I don't particularly remember, but it is likely I did.

Q. Q. 1587. Did you show him your faucets?

A I may have, but I don't remember that I did.

Q. Q. 1588. What time of day was it when he came there?

A. I don't remember that. I rather think it was in the afternoon, but I wouldn't be positive.

Q. Q. 1589. In what part of the shop was the interview?

A. In the part where the clock was. I think it was in the clock-room, though, before there was a partition run lengthways through the shop. I think so, but I won't be positive.

Q. Q. 1590. Did you ever make or experiment upon a machine for transmitting and understanding messages by variations of tone and pitch.

A. No, sir; I never did.

Q. Q. 1591. Did you ever make or experiment upon a machine for transmitting letters of the alphabet by variations of tone and pitch?

A. No, sir; I had made an electric apparatus for transmitting words by letters of the alphabet. That was a magneto-electric machine, but not for transmitting by tones or pitch.

Q. Q. 1592. Do you recollect whether you showed him that magneto-dial telegraph?

A. I don't remember that I did. I may have.

Q. Q. 1593. You testified in your cross-examination, that you had, prior to that time, read somewhere a description of the French machine, called the "Phonautograph." Is it your recollection that the description was clear enough for you to understand the nature and mode of operation of the "Phonautograph"?

A. Yes, sir; there was a cut illustrating it, and a description.

Q. Q. 1594. If you remember, please give me an idea of the construction and mode of operation of that "Phonautograph," as it was there described?

A. I will try, yes, sir. I could give a better idea if I make a sketch.

[*Witness makes a sketch, and then answers:*]

In making the sketch—it has been a great while ago since I seen the original drawings, and it may not be correct in every detail, but the general principles are correct.

AA are supports, or a frame for carrying a cylinder, B; at one end of this cylinder is attached a tube, C; the outer end of the tube, C, is provided with a thin membrane, D; in the centre of said membrane was attached a thin cord, or silk fibre, which run through the tube and into the cylinder B, and was attached to a right-angled lever, F; said lever was secured to a bracket upon a shaft, G; the upper end of said lever—that is, the end that stands parallel with the edge of cylinder B—carried a fine tracer, H. In the interior of the cylinder was placed paper—that I could not draw in there—which was smoked by a lamp, and nicely secured to the inside of the cylinder. The cylinder was revolved by clock movements. These I have not made any sketch of. Any sounds made in the neighborhood of the diaphragm caused the membrane to vibrate, which communicated the vibrations to the right-angled lever, F, which would record the vibrations on the surface of the paper. There was a mode explained of making the traces indelible by soaking the paper, after taking it out of the cylinder, in a tray that contained gum water. I think the cylinder B inside was coated with plaster-of-paris.

Adjourned until Feb. 18, 1882, at ten, A. M..

Feb. 18, 1882, ten, A. M.

Examination resumed.

Present same counsel.

Re-direct examination of Daniel Drawbaugh by Mr. Hill continued:

(Witness continues:) The screw G, to the best of my recollection, was provided with a screw band, and was stationary, for the purpose of moving cylinder B horizontally while it was revolving. I know it was intended to have a horizontal movement, and I think that was the plan.

Q. Q. 1595. What effect did you understand the horizontal movement of the cylinder would have upon the tracings made by the little pointer or tracer?

A. The idea of the horizontal movement was that when the cylinder would make a complete revolution, it would not present the same surface of paper; that is, it would present a new surface of paper.

Q. Q. 1596. Was this "Phonautograph" described as a machine operating by any form of electricity or magnetism?

A. No, sir.

Q. Q. 1597. Was it described as a machine for transmitting sounds to a distant point and enabling them to be heard?

A. No, sir; it was intended to record sounds within the cylinder that were made in the neighborhood of the membrane—the way I recollect it.

Q. Q. 1598. Do you recollect whether you first saw that description of this "Phonautograph" before or after you made your phonograph experiments?

A. I think, before—I am positive, before.

Q. Q. 1599. Do you remember whether your phonograph experiments were before the Axle Company began operations or not?

A. I don't think they were before the operations began.

Q. Q. 1600. Do you remember whether they were before you moved to Mechanicsburg or not?

A. I think so.

Q. Q. 1601. Do you remember whether you saw the description of the "Phonautograph" before the operations of the Axle Company began?

A. Yes, sir; a good while before that—a number of years before that. I couldn't give the number though.

Q. Q. 1602. Had you made and used any of your telephones before you saw the description of the "Phonautograph"?

A. I couldn't be positive as to that. I think I had, but wouldn't like to be positive.

Q. Q. 1603. There was a machine made at Paris, France, as early as 1864, and in Germany before that time, and well known in France and Germany, that is known as the Reiss telephone, from the name of its inventor. Had you ever known of that machine prior to Mr. Matthew's visit to your shop, early in 1878?

A. I think I had. I got a knowledge of that machine from Mr. Shapley, at Mechanicsburg, during the time I lived in Mechanicsburg. He gave me a copy of the *Scientific American* that had an illustration and a description of it in, and told me that was something of the nature of the machine I was working at, then. I think the paper may be in my shop somewheres yet.

Q. Q. 1604. What did you understand to be the character and mode of operation of that Reiss telephone?

A. It was represented as transmitting musical sounds or tones by means of electricity.

Q. Q. 1605. Did you understand it to be an instrument operated by a continuous circuit, or by a make and break circuit?

A. By a make and break.

Q. Q. 1606. Did you examine the description and illustration sufficiently to thoroughly understand the construction and mode of operation of the instrument?

A. Yes, sir; I did.

Q. Q. 1607. Did you, at the time, regard it as an instrument capable of transmitting vocal speech, between distant points, so it could be understood?

A. I did not. It wasn't represented, either, to be that.

Q. Q. 1608. Do you remember whether any other telephone was described in the same article in which you saw a description of that?

A. I don't think there was. The description of that was given in connection with a lecture that was given in New York on the telephone or some portion of science. At any rate, the telephone was a part of the lecture. The gentleman delivering it was proposing some improvements—that it might be used for transmitting spoken works—I don't remember exactly. He didn't have any particular plan, but he thought it might be got at by properly arranging the walls of the instrument and destroying the reflection. If I remember right, I think the instrument had been put up in the Hall, and he exhibited the apparatus.

Q. Q. 1609. When you read the description of that Reiss instrument, as stated, do you remember whether you agreed in opinion with the lecturer, as to the possibility of adapting a make and break instrument to transmitting vocal speech?

A. I didn't think a make and break instrument would be able to transmit spoken words.

Q. Q. 1610. Had you, before you read that description, transmitted vocal words from one place to another, by means of any of your electric or magneto talking machines?

A. Yes, sir. I had. I am positive of that.

Q. Q. 1611. The little magneto machines, "D" and "E," if I understand you and other witnesses, were made about the time when the Axle Company commenced operations. They were not, if I understand you correctly, the first magneto telephones that you had made?

A. They were not the first. "C" was the first magneto-transmitter, and "I" was a receiver. Some time after that, I used "I" as a magneto-transmitter also.

Q. Q. 1612. When you made and used the carbon machine "F," with its receiver "B," that is, the old tumbler and tin can, and transmitted vocal speech through them, so that it could be heard and understood at a distance, did you regard the invention as a mechanical success, so far as the transmission of vocal speech was concerned?

A. I did so far. It wasn't as satisfactory and loud as I wished it to be. I afterwards tried to make it more satisfactory. I did make it a success so far as transmitting speech—for I did do that—but I thought it wasn't loud enough for practical purposes. That idea I may have got from others, for a good many persons remarked that it wasn't sufficiently loud.

Q. Q. 1613. You spoke, in your direct examination, of other persons suggesting that the instrument ought to be made loud enough for a person to stand at a distance from the receiver, and hear and understand what came through it, without going to the table, or place, where the receiver was situated. Is that what you refer to in your last answer as the idea of some others?

A. Yes, sir; and some said it wasn't loud enough, without making the remark about going close to the table, or to where the instrument was.

Q. Q. 1614. Were the instruments "C" and "I" an improvement in respect to loudness?

A. Yes, sir. Loudness and plainness too.

Q. Q. 1615. Were they an improvement, or not, in respect to adjustment?

A. Yes, sir.

Q. Q 1616. I understand you that, as early as 1870 or 1871, you would have taken a patent on your telephone, if you had had the means. Am I correct?

A. Yes, sir.

Q. Q. 1617. You regarded the invention then as a mechanical success, and as practicable, for the transmission of vocal speech to distant points. Did you not?

A. Yes, sir; and before that, perhaps.

Q. Q. 1618. State whether you ever afterwards changed your mind about it?

A. No, sir. I never did, but I was still working on it, and trying to improve it more.

Q. Q. 1619. And you are still endeavoring to improve it, if I understand you?

A. Yes, sir.

Q. Q. 1620. Do you know whether, or not, a great many other inventors are still endeavoring to improve the telephone?

A. Yes, sir. I think so, by what I can hear and read on the subject.

Q. Q. 1621. Have you ever talked, or heard anybody talk through the telephones that are in use here in this city of Harrisburg, connected with the Telephone Exchange?

A. Yes, sir.

Q. Q. 1622. When, first?

A. I don't know. I could hardly give the year. It was about 1878 or 1879. It may be before.

Q. Q. 1623. Where?

A. At Mr. Stees' lumber office, at the lower end of the city, and, I think, at the Western Union Telegraph Office, at the time they had a small office outside—a temporary building in the yard—Mr. Clute gave me the instrument, and some person at a distance spoke. I could not understand, and he took the instrument. The instrument then used was the oval instrument. I think it was the Phelps instrument.

Q. Q. 1624. How did that instrument compare in loudness and clearness with your old tumbler and tin can instruments, and with your magneto instruments, "C" "I?"

A. I didn't think it was as loud as my magneto instruments, "C" and "I," and it wasn't as loud as the old tumbler and tin can instruments, when properly adjusted—and other instruments also. The clearness—I think the tumbler instrument wasn't as clear perhaps. I think that all magneto instruments are more clear, but not as loud as the carbon instruments. I mean all the magneto-instruments that I have examined or tried. I think the Phelps instrument was clear, and didn't notice anything in its clearness. It was a magneto-instrument. It wasn't used as a carbon instrument.

Q. Q. 1625. I understand you that you could not hear through the Phelps instrument. Why was that? For want of loudness or clearness? I refer to the time when you tried it at the Western Union office.

A. For want of loudness. I heard some words but not whole sentences. I didn't understand the subject the man was speaking upon.

Q. Q. 1626. Could you hear and understand, through the instrument at Mr. Stees' office, when you tried it?

A. I did, some, yes.

Q. Q. 1627. How did that instrument compare in loudness with your old tumbler and tin can instruments, and with your instruments "C" and "I?"

A. I don't remember that I formed any idea at the time.

Q. Q. 1628. How did it compare in clearness, with your old instrument, referred to in my last question?

A. That I don't remember. As I remember now, I think it was clear. I understood the instrument.

Q. Q. 1629. Did you, yourself, ever procure the publication of any articles about your electric or magnetic clocks?

A. Never; no sir.

Q. Q. 1630. You moved back from Mechanicsburg about the first of April, 1877, and the electric Clock Company commenced business in the spring of 1878. During that year, from the time when you moved back from Mechanicsburg till the time when the electric Clock Company commenced business, to what extent were you working on your telephones?

A. As near as I remember, I was working on them. The extent I can't exactly say, but I was working on them, I know. I think that, during that time, I was experimenting on different kinds of diaphragms. That is, on the cone. I had a temporary cone put up against the wall of the shop, or against the cupboard of the shop. I am pretty positive that was one of the experiments, that I had during that time. There may be others that I don't remember. Very likely there were. I might state here, that, while I was experimenting on that, I made quite a number of cones of different shapes, and tried them; but some of these experiments may have been after 1878, too. But I got up a complete cone instrument between 1878 and 1880, or between 1879 and 1880. It is sufficient to say, it was the cone instrument.

Q. Q. 1631. Did your experiments on telephones run through the year 1877, or were they confined to any particular part of that year?

A. I don't remember. Whenever I had time, I would work on them. I know I worked very often at night on them, and late at night, particularly if I had any work to do in the daytime.

Q. Q. 1632. During the year 1877, where were the telephone instruments that you had made prior to that time?

A. They were in the shop.

Q. Q. 1633. Were they capable of being practically operated, during that year?

Yes, sir.

Q. Q. 1634. And were they practically operated during that year?

A. Yes, sir; on lines in my shop; and a great many persons heard them operated, at different times.

Q. Q. 1635. You have spoken, in cross-examination, of quite a number of different machines, for other purposes than the transmission of sound, which you have, at different times, invented. Referring to those machines, were your old faucets and pumps, which you invented as early as 1866, mechanically successful?

A. Yes, sir; they were.

Q. Q. 1636. Is your water motor a mechanical success?

A. Yes, sir; I think so. There was quite a number of them put up, and they are running machinery.

Q. Q. 1637. Was your magnetic clock a mechanical success?

A. I think so. It has been running a number of years.

Q. Q. 1638. Was your grape stemming machine, that you invented and made for Mr. Hertzler, a mechanical success?

A. Yes, sir.

Q. Q. 1639. Was your tack machine a mechanical success?

A. Yes, sir.

Q. Q. 1640. Was your stave-jointer a mechanical success?

A. Yes, sir; there were over a hundred sold in Cumberland county.

Q. Q. 1641. Was your stave-cutter a mechanical success?

A. Yes, sir.

Q. Q. 1642. Was your nail-plate feeder a mechanical success?

A. Yes, sir; I think it was. I don't see why it wasn't.

Q. Q. 1643. Was your ryne and red-staff a mechanical success?

A. Yes, sir.

Q. Q. 1644. You testified to getting up machines to do the Faucet Company's work. Were they mechanically successful?

A. Yes, sir; they had been used in the shop a number of years, and were used in Hauck brothers' shop, at Mechanicsburg, several years.

Q. Q. 1645. You testified to getting up machines to do the Axle Company's work. Were they mechanically successful?

A. Yes, sir.

Q. Q. 1646. Was your stethoscope a mechanical success?

A. Yes, sir; I think it was. I could use it as such, and did use it.

Q. Q. 1647. Did it work well?

A. Yes, sir. I might explain it. I had a tube connection with it, perhaps four or five feet long, for trial. I put a watch at one end of it, and could hear very distinctly the ticking of the watch. I put one end of the instrument to my heart and the other end to my ear, and could hear the beating of my heart.

Q. Q. 1648. Was your machine for wrapping wire a mechanical success?

A. Yes, sir; I used it for that purpose, and it answered the purpose very well.

Q. Q. 1649. How did your fire apparatus work?

A. That worked very well. I had it temporarily put up, and a number of persons seen it and tried it. I considered it an apparatus that would work.

Q. Q. 1650. How did your dial telegraph work?

A. It worked very well. I never had it on a very long line, but suppose it would work on a pretty long line.

*Q. Q.*6 151. You testified to having at one time a cider mill, which you sold in the summer or fall of 1875. Do you remember what you got for it?

A. I don't remember the exact amount. I think it was somewheres between thirty-five and forty dollars.

Q. Q. 1652. To whom did you sell it?

A. Elias Hake.

Q. Q. 1653. How did he pay for it, and when?

A. I took a portion of it out in flour and mill feed. He paid me some money, but I don't remember the amount. He paid me some money when he bought it, and the mill feed—I suppose I had got some before that and some after. I don't remember distinctly.

Recess for dinner until 2, P. M.

Feb. 18, 1882, 2, P. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Re-direct examination of Daniel Drawbaugh by Mr. Hill continued:

Q. Q. 1654. Do you know the full name of Mr. Clute?

A. I do not. I meet him very frequently, but I never knew his full name. I may have heard it, but have forgotten.

Q. Q. 1655. What is his occupation now?

A. He is connected with the telephone business in some way. I do not know what—an agent, as I understand it.

Q. Q. 1656. Do you understand him to be an agent of the Bell Telephone Company, one of the Complainants?

A. Yes, sir. That was what I had reference to. I heard it stated that he was. I understood it to be such. He told me had a number of counties that he was attending to. I got the impression that he was an agent.

Q. Q. 1657. What was his occupation at the time when you tried the telephone instrument, that you think was the Phelps, at his office?

A. I thought he was proprietor of the Western Union Telegraph Office, then, and of the telephone in connection with that. I just formed the impression. I don't think he told me that.

Q. Q. 1658. You spoke something about a building in the yard. What was that and what was it used for?

A. It was used for the telephone. I seen nothing in there but a couple of Phelps' telephones; and a call I seen there too; that is, a Morse sounder, which, I supposed, was used for a call.

Q. Q. 1659. When Mr. Shapley showed you the copy of the *Scientific American*, with the illustration and description of the Reiss telephone, do you remember how long it was after the article was published or after the date of the newspaper?

A. I don't remember how long, but my impression was that it was was not very long, though it might have been six months. I ain't positive as to the length of time.

Q. Q. 1660. Have you and Mr. Shapley been on friendly terms since the Clock Company was started?

A. When we meet we speak, but I don't think he thinks as much of me as he did at one time. By his manner when we meet I would think he didn't think very much of me.

Q. Q. 1661. When you purchased your old parlor organ, for the use of what member of your family did you purchase it?

A. For my daughter Emma.

Q. Q. 1662. When you saw the Edison, Phelps, Bell, or other telephones here in Harrisburg, did you open them to see what the internal construction was?

A. No, sir. I did not.

Q. 1663. Did you ever see Alexander Graham Bell's telephone patents, or copies of them, prior to the institution of this suit?

A. No, sir.

Q. Q. 1664. In cross-examination you spoke of making certain tests of the telephone currents by means of a galvanometer. How often and in what years did you make such tests?

A. I couldn't tell how often—at different times—frequently, at a pretty early time.

Q. Q. 1665. You testified to adjusting the carbon instrument to a certain amount of resistance, and then testing the current by a galvanometer, and that the galvanometer appeared to show a less amount of current passing over the line, while you were speaking through the telephone, than when you were not speaking. Did you, at the time, form any theory or opinion as to the cause of this phenomenon?

A. I think I did. Yes, sir.

Q. Q. 1666. What was your theory regarding it?

A. The amplitude of vibration would be less when it was in contact with the carbons. That is, the movements from the carbon would be greater than the amplitude towards the carbon, or low conductor, which would diminish the general pressure of the carbons, which would denote less current—more resistance.

Q. Q. 1667. You have several times in cross-examination mentioned using tin in connection with your instruments. Did you mean tinned sheet iron—commercial tin ?

A. Yes, sir. Tinned sheet iron. Tinned plate, it is called.

Q. Q. 1668. You have testified that you had a sheet metal diaphragm on the instrument "C" at an early period. Was that the first sheet metal diaphragm that you used on any instrument ?

A. No, sir. I think not. On the tumbler instrument I had used one.

Q. Q. 1669. You have testified, in answer to cross-question 1271, that a bladder membrane would last a long time, if the mice didn't eat it. Were the tumbler and tin box instruments, which contained bladder membranes, kept where they were accessible to mice ?

A. Yes, sir. There was mice in all portions of the shop.

Q. Q. 1670. Did it ever happen that they got on the diaphragms and ate them, to your knowledge ?

A. Yes, sir. Several times they had destroyed or ate part of one of those reproduced instruments—middling recently.

Q. Q. 1671. Were you accustomed to keep yourself provided with bladders for such an emergency ?

A. I had, sometimes, bladders about the shop.

Q. Q. 1672. You have several times referred to the time of painting Sadler's wagon as the time at which, or before which, you could fix the date of instrument "C," and the time of painting Sadler's wagon has been pretty definitely fixed by the testimony of George W. Drawbaugh. By your own unaided memory, without the assistance of George W. Drawbaugh, how near could you have fixed the time of painting that wagon ?

A. I don't know—within a year or two, I guess.

Q. Q. 1673. By your own unaided memory could you, or could you not, have fixed it as being prior to the time when Haucks purchased the faucet business?

A. Yes, sir; I could have. I know it was before that.

Q. Q. 1674. You have testified that the electro-magnet now on instrument "B" is somewhat smaller than some of the electro-magnets which were formerly upon that instrument. Do you know when the electro-magnet, that is now on "B," was put there?

A. I do not. I don't know when.

Q. Q. 1675. State whether it was put there for any purpose connected with this suit?

A. I don't know that it was. I can't remember that it was.

Q. Q. 1676. Do you know whether there has been any change in the electro-magnet of that instrument, by taking one off and putting another on, since the time when instrument "A" was made, prior to the beginning of the Axle Company?

A. I don't remember. I think not. There has no change been made, to the best of my recollection.

Q. Q. 1677. In cross-answer 906, referring to your offering Shapley one-half interest in the clock, you say, "I suppose I offered him one-half, as I was in the habit of doing—a half interest in nearly all my other inventions." Do you mean that you offered Shapley a half interest in nearly all your other inventions, or that you were in the habit of offering other parties that you thought would invest?

A. I was in the habit of offering other parties a half interest in my other inventions. I had reference to that one invention—the clock.

Adjourned until Feb. 20, 1882, at 9.30, A. M.

Feb. 20, 1882, 9.30, A. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Re-direct examination of Daniel Drawbaugh by Mr. Hill continued.

Q. Q. 1678. You have referred in your re-direct examination to seeing a description of a Reiss telephone, in the *Scientific American*, in a copy of said paper, given you by Mr. Shapley. After giving that testimony you were requested, orally, by Mr. Storrow, to make a search for the paper. Have you complied with his request?

A. Yes, sir.

Q. Q. 1679. Did you find the paper?

A. Yes, sir; I made search for it yesterday. I suppose I was at it four or five hours—making search for it.

Q. Q. 1680. Have you the copy of the paper here?

A. Yes, sir.

Q. Q. 1681. Will you please produce it, that I may put the article referred to in evidence?

A. Yes, sir; Here it is.

[*Mr. Hill puts the said article in evidence, to be marked "Exhibit Reis Telephone Publication," the same being an article entitled "The Invention of the Telephone," by P. H. Van Der Weyde, M. D., contained on page* 145, *of the Scientific American, of March 4th,* 1876, *the number of the newspaper being, Vol.* 34, *number* 10, *new series.*]

[*The name of the inventor referred to in said article is spelled "Reuss," but it is agreed between counsel for Complainants and Respondents that he is the same individual whose name is usually spelled "Reis."*]

Q. Q. 1682. While making your search for this article about the Reis Telephone, did you anywhere discover the articles describing and illustrating the phonautograph, as testified by you?

A. No, sir; I don't remember what publication I seen it in. I wasn't sure that I seen it in the *Scientific American;* but I didn't find it.

Q. Q. 1683. While making your search, did you discover any article relating to the recording or transmitting of sound?

A. Yes, sir.

Q. Q. 1684. If you have the article, or articles, here, please produce them that I may put them in evidence?

A. Yes, sir; the article is here and is entitled "Improved Acoustic Telegraph."

[*Mr. Hill offers said article in evidence, to be marked "Exhibit Everitt Acoustic Telegraph," the same being an article entitled "Improved Acoustic Telegraph," contained on page* 369, *of the Scientific American, of December* 12*th,* 1863, *volume* 9, *number* 24, *new series. Mr. Hill also offers in evidence, as "Exhibit Scott Article," an article entitled "Fixing Sounds," contained on page* 371 *of the same number of the Scientific American, to wit, the number of Dec.* 12*th,* 1863.]

Q. Q. 1685. Were you a subscriber of the *Scientific American* at the time of the issue of the number of December 12th, 1863?

A. Yes, sir. I was.

Q. Q. 1686. Is this number, which you have produced in evidence, one of the papers which you received as a subscriber at that time?

A. Yes, sir. I got it out of the volume. I generally filed the numbers regularly as I got them. I mean after reading them.

Q. Q. 1687. In the article entitled "Improved Acoustic Telegraph," at the upper right-hand corner of the cut thereon, I observe a cross, in pencil marks; and at the upper end of the article entitled "Fixing Sounds," I observe two pencil marks. Explain when and why those pencil marks were placed there?

A. The time is so long that I don't remember when the marks were placed there. But they may have been placed there shortly after I received the papers. I marked them for some purpose,—perhaps referring to some article of the same nature. I could not positively say for certain what they were placed there for.

Q. Q. 1688. In cross-examination, you referred to the fact that you at one time connected your telephones to a wire fence, and placing the transmitter near the clock, with the receiver at the other end of the line, transmitted sound over the line for a distance of over a mile and a half. Was that experiment a successful one, or not?

A. Yes, sir. I could hear the tick of the clock at the receiving end.

Q. Q. 1689. Do you remember what transmitter and receiver you used in that experiment?

A. I used the transmitter—the glass tumbler—set it up on a bracket close to the face of one of those old English clocks, that was then in the office, in the small private room; and the other end—I think it was the tin can—I won't be too positive—was at the receiving end; and I heard the ticking of the clock. I will explain a little about the bracket I mentioned. I don't know whether it was properly a bracket—I had removed the casing that covers the face of the clock—that slid on that. After removing, that formed a shelf at the side of the face of the clock, and on that projection was where I had set the transmitter.

Q. Q. 1690. Did you measure the length of the line, or only estimate its length according to your best judgment?

A. I didn't measure it. I just estimated it. I take it from this; that it is a pretty long fence row, and it had a number of wires—three or four—that I had insulated, and caused the current to travel back and forth over them.

Q. Q. 1691. Why did you not use that line for transmitting vocal speech?

A. I hardly know why. I did that in the evening. I know there was no one present but myself. The experiment was, to know whether I could hear a delicate sound made through a considerable length of time.

Q. Q. 1692. Had you, before that time, successfully transmitted speech over wires by means of your electric telephone?

A. Yes, sir.

Q. Q. 1693. Had you, before that time, experimented in listening to the ticking of a clock, and the transmission of its sound by your electric telephone?

A. Yes, sir; over the shorter lines in the shop.

Q. Q. 1694. How did you find the results over the long line, compared with the results that you had before obtained over the short lines?

A. I don't remember the difference that there was. I heard the ticking of the clock in both cases. I know I distinctly heard the tick of the clock in the long line.

Q. Q. 1695. Did the experiment satisfy you that telephones would work successfully on lines of a mile or more in length, or not?

A. Yes, sir. I believed that before, though. I believed they would.

Q. Q. 1696. You testified, on cross-examination, that when, during the cross-examination, you went to Mr. Christian Eberly's house, to refer to his account books, Mr. Jacobs went with you. State whether or not it was understood by counsel for Complaintants here at the time, when you were requested to go, that Mr. Jacobs should take his carriage and convey you there, for the reason that you had no conveyance of your own?

A. Yes, sir; Mr. Jacobs, after they made the request, stated himself, that he would take me. The roads were bad, and I think that we adjourned at an earlier hour that evening for that purpose, that we generally did.

Q. Q. 1697. Complaintant's counsel also requested you to visit Mr. Gardner, and abtain certain information from him on his books, which it appears you did not do. Why did you not?

A. I had asked Mr. Jacobs, and told him we would go down to Mr. Gardner's—I had no other way—he generally took me to these places—and he refused or declined to go, on account of the Eberly matter being placed on the record.

Q. Q. 1698. In cross-question 1201, referring to your visit to Mr. Eberly's to examine his books, Mr. Smith asked you, "Was Mr. Jacobs with you, when you obtained this information from Mr. Eberly?" Was that the matter, which, being placed on the record after the understanding of counsel that Mr. Jacobs should go with you to Mr. Eberly's, caused Mr. Jacobs afterwards to decline going with you to Mr. Gardner's?

A. Yes, sir; he told me so—that for that reason he declined taking me.

Q. Q. 1699. You have testified in cross-examination, that you made a number of changes of magnets in some of your telephones, state whether or not you ever changed the electro-magnets on instrument "A," after its construction.

A. No, sir. To the best of my recollection, I did not.

Q. Q. 1700. State whether or not you ever changed the magnets or electro-magnets on the small magneto instruments "D" and "E," after their construction?

A. No, sir. I did not. I know I did not on them. I am positive I did not. I had made some little changes in diaphragms—sometimes thicker, and sometimes thinner diaphragms; and I had made the interior larger—turned out a recess in one of the instruments. That is all the change I can remember of.

Q. Q. 1701. State whether or not you ever made any change in instrument "A" after the formation of the Axle Company?

A. I think not. To the best of my recollection, I did not.

Q. Q. 1702. Is it your recollection that you had the instruments "C" and "I" in operation up to the time when the instruments "A," "D" and "E" were made?

A. I think so. To the best of my memory or recollection, I had.

Q. Q. 1703. A great many different witnesses have testified to the fact of their being at your shop prior to the year 1876, and seeing and using your different telephone instruments, or some of them; were those witnesses all the persons who visited your shop and saw and used your telephones prior to 1876, or not?

A. No, sir. They were not. I couldn't remember all the parties. I don't suppose we have near all the parties that visited me. But have learned of other parties, that I know were there and seen the instruments, and that I explained them to them.

Q. Q. 1704. Referring to the paper tub or funnel, that you have testified was applied at an early day to your receivers, and was placed on or taken off at different times; state whether or not that funnel was so turned up as to make it more convenient to apply them to it than to the end of the tin can receiver?

A. Yes, sir. That was the idea; and that it would be brought down smaller and concentrate the sound more to the ear.

Q. Q. 1705. You were asked a number of questions in cross-examination with reference to changes in instrument "B," before you quit using instrument "B." When did you quit using instrument "B?"

A. I could hardly state when I quit using "B." I had used the tumbler in connection—I had used it in connection with other instruments, after I had used the tin can, but how long I can't say. I could not exactly state when I quit using the tin can. I often, though, showed it to parties at a later period. It may have been up to within a year or so ago, that I showed it, as that was one of the original instruments that I used as a receiver. I mean that I showed it to parties to illustrate that it was one of my original telephones or receivers.

Q. Q. 1706. Did you use the old tumbler instrument to illustrate in the same way?

A. Yes, sir.

Q. Q. 1707. You were asked in cross-examination whether the metal diaphragm which is now on instrument "C" is the one that was on it at the time of your painting Sadler's wagon, to which you answered that you thought so, but would not be positive. Do you remember whether the diaphragm of "C" has been changed since you dispensed with the the two diaphragms and the connecting strings on that instrument?

A. I don't think it was, but I won't be too positive. I don't remember.

Q. Q. 1708. Do you remember whether the diaphragm was corrugated at the time when you were painting Sadler's wagon?

A. I think it was.

Q. Q. 1709. Please think over the experiments that you made with the telephone instruments connected with the wire fence, and state whether you distinctly remember now what instrument it was that you used as a receiver in that experiment, whether it was instrument "A" or "B," or some other instrument?

A. I don't just very distinctly remember now, but I have an idea that it was the tin can. The experiment was at a pretty early day, too, and that makes me think it was "B." I can't state the year when the experiment was. I may have tried on others. I may have tried it on "A."

Q. Q. 1710. In cross-question 1439, you were asked whether, after the work that you did for Etter & Shanklin, you did any work for Hake's mill, to which you answered that you did some work, but did not remember how much. Do you remember whether you got your pay for that in money, or in something else?

A. In flour, feed, and mill-stuff—no money.

Q. Q. 1711. (*de bene.*) You were asked in cross-examination, with reference to an alleged statement of Mr. Clarence D. Rockafellow, to the effect that you told him, in April, 1878, that you had not as yet made your telephone a mechanical success and were yet to make improvements on it to make it practical—a result which you had not yet attained, to which you replied, "Well, I may have said that, because I was working to get louder results. I know I made that remark often, and he appeared to be satisfied with the result—the tenor of his conversation. I don't remember the words. The remark above referred to, as one that I often made, was that I kept improving it to get louder results." Please explain more fully your meaning in said answer?

A. I don't remember, you know, the particulars of that conversation, but I often made the remark to others that I was still working on it, as improving it. There was parties often said that they was satisfied they could hear the words, but it should have been made louder. They could hear it at some distance—and from that fact of my trying to get it to produce as loud results as possible. And I may have stated to him that I was trying to get it more successful. I don't see why I would say it wasn't a mechanical success, because I had it in use, and even he heard through it and appeared to be perfectly satisfied.

Q. Q. 1712. (*de bene.*) It is alleged that Mr. Rockafellow says, in effect, that you were, at the time of his visit, constructing a new telephone. Do you remember what particular instrument it was that you were then at work upon?

A. I do not remember what instrument.

Q. Q. 1713. (*de bene.*) Did you at that time, or did you not, regard your telephone invention as having reached the condition of a practicable machine for the transmission of vocal speech, between distant points, by electricity?

A. Yes, sir; but there was no period but what I was still improveing on them.

Q. Q. 1714. (*de bene.*) It is alleged that Mr. Rockafellow says that you told him you had not yet attained the result of a practicable instrument. What have you to say about that statement?

A. I don't know what to say about it. He might have inferred from my manner of speaking, as I stated generally, that I was improving on it. He might have inferred by that that it was not a practical and mechanical success. I did not know whether he had that idea, but I say he may have inferred it. I think that it was a success, because I transmitted spoken words through it, and a great many other people had heard through it and spoke trough it.

Q. Q. 1715. (*de bene.*) Do you remember the words or expressions that you actually used in that conversation with Mr. Rockafellow?

A. No, sir; I don't remember the words that I used.

Q. Q. 1716. (*de bene.*) How long was the conversation?

A. As near as I can remember, between half an hour and an hour It may have been a little more. I don't remember the length of time.

Q. Q. 1716. (*de bene*) What did Mr. Rockafellow go to your shop, on that occasion, for?

A. I don't remember. I don't know. He came in and I showed him the instruments. I showed him the clock also, and a number of other instruments.

Q. Q. 1717. (*de bene*) Do you remember whether he came to see the clocks?

A. I don't remember. I don't know what he came for.

Q. Q. 1718. (*de bene*) Was anyone with him?

A. I think there was a gentleman, but I don't remember that very distinctly.

Q Q. 1719. (*de bene*) Do you remember whether the other gentleman talked through the telephones or listened to them, or not?

A. I don't remember that. He may have.

Q. Q. 1720. (*de bene*) Do you remember whether the other gentleman took much part in the conversation about mechanical matters?

A. I don't think he did. Rockafellow and I had most, or I may say, all of the entire conversation.

Q. Q. 1721. (*de benc*) Do you remember what particular telephone instruments were used, when Rockafellow tried them?

A. I do not.

Q. Q. 1722. (*de bene*) Where were the transmitter and receiver when Rockafellow tried them?

AMERICAN BELL TELEPHO

A. I don't remember that exactly, but it occurs to me that he was in the small room when he listened. But I won't be too positive.

Q. Q. 1723. (*de bene*) Who talked through them when he listened?

A. I did. I think so.

Q. Q. 1724. (*de bene*) Were you in the same room with him when you talked through them and he listened, or in different rooms?

A. That occurred so often—of people coming there and I would exhibit—but as a general thing I would not be in the same room. I would always be in a different part of the shop. I don't remember whether I was down stairs or not, but it was likely I was down stairs, providing I had the instrument really up. Sometimes I wouldn't have them attached, and had to carry them and attach them to the wires. I don't remember exactly how it was. It occurred so often of people coming there, that I couldn't remember particularly the occurrence of each one.

Q. Q. 1725. (*de bene*) When Rockafellow had listened at the receiver, did he say whether he heard through it what was said at the transmitter?

A. I think so, for I know that was the general conversation after we met. He appeared to be satisfied with the results.

Recess for dinner until 2, P. M.

Feb. 20, 1882, 2, P. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Re-direct examination of Daniel Dawbaugh by M. Hill continued:

Q. Q. 1726. (*de bene*) Do you recollect whether he expressed himself as satisfied with the results?

A. I don't recollect that, but my impression was that he was satisfied. I think he said it worked well, or something of that kind. I don't remember the conversation, but I inferred that he was perfectly satisfied.

Q. Q. 1727. In cross-question 1294 you were asked, in substance, in what condition did you get the best results from the carbons, as to being moist or dry. To which you answered as follows: "After my later experiments, I found the dry carbons were the best. In the former—in using earth and some of them combinations—a certain degree of moisture was the best." What time do you refer to as the time of your later experiments mentioned in that answer?

A. At the time I used carbon alone—charcoal and coke and gas retort carbons—I had no particular times. I mean by the later experiments, when I used these carbons. I had reference to fine carbons—pulverized.

Q. Q. 1728. At how early a time do you think you used carbons dry?

A. I couldn't positively give you any period; as early as 1871, perhaps, and perhaps a little later. I can't just give you the time.

Q. Q. 1729. You were asked in cross-examination—cross-question 1538—whether you and Mr. Jacobs, or either of you, had visited Mr. Watts for the purpose of obtaining an affidavit from him, to which you replied that you had and said he declined giving an affidavit. You were then asked in the next question whether Mr. Watts, at the time of his visit to your shop, said anything to you about having seen an article in the *Scientific American* in regard to transmitting sounds. State all that you remember that Mr. Watts said at the time when you and Mr. Jacobs visited him for the purpose of getting his affidavit which he declined to give.

A. We had asked him for an affidavit, and he declined giving it. He said that if he was regularly summoned, he would attend. There was some other conversation, but I don't remember what it was.

Q. Q. 1730. Do you remember whether he stated that he had seen telephone instruments at your shop at the time of his visit there?

A. I think he did. We had give him two visits. At the first visit, I think he stated that he had seen instruments at my shop.

Q. Q. 1731. At the time of your second visit to Mr. Watts, do you remember whether he said anything about having been called upon by one, Mr. Weeks, for an affidavit in behalf of the Complainants?

A. Yes, sir; I didn't remember any more the name of the party, but he said he had been called on for an affidavit for the opposite side, and I think he said he had declined giving him one.

Q. Q. 1732. You referred, in answer 1544, to making the observation to a number of persons that a sound would be reproduced on a window pane.

A. I meant that on one occasion I was sitting close to the window, and my daughter was playing on the organ, and I discovered the sound of reproduced music close to where I was, at the window, and I examined it, and found that a portion of a window pane was loose at the corner.

Q. Q. 1733. How long ago was that?

A. I don't remember. It appears that was pretty long ago. I couldn't state how long; quite a number of years, though.

Q. Q. 1734. Referring to the machine "H"—the large machine with the inclined front side and the call-bell on top—do you remember whether, since that machine was first constructed, you have ever changed any of the parts of it, substituting other electro magnets, or otherwise changed it?

A. No, sir; I think not. To the best of my recollection, I did not. There were no electro-magnets in that machine, as far as the transmitting was concerned. There was an induction coil. There had been an electro-magnet in for the call-bell. That was removed.

Q. Q. 1735. Then the transmitting instrument therein contained remains the same as when it was first constructed, if I understand you correctly?

A. Yes, sir; to the best of my recollection, with the exception that the carbons may be lost out, and I guess they are now.

Q. Q. 1736. And the instrument "J"—with the double set of carbons—has that been changed in any respect since it was first constructed?

A. No, sir; not to the best of my recollection.

Q. Q. 1737. Referring to the instruments "A," "B," "D," "E," "H," and "J," state whether or not you ever had to make search for any missing parts of any of those instruments, so far as you recollect?

A. Not that I can recollect. Now since considering, I think I made search for the cover of one of the magneto instruments—the one that has the bottom cover off.

Q. Q. 1738. Do you mean that you made search for the missing bottom cover?

A. Yes, sir.

Q. Q. 1739. You have testified, in effect, that after unsuccessful efforts to induce different people to take a half interest in your telephone invention, and furnish the money for procuring patents and introducing it into public use, you expected other parties to go into the manufacture of the magnetic clocks and to go into the manufacture of the improved faucets. What was your object in embarking upon the clock business and the faucet business in 1878 and 1879?

A. My object was this, that I was pretty poor. I was anxious to get some party to take an interest in and run that business, to make some money by it. I was anxious also to make a raise, to have money to secure my telephone improvements. I know that I often desired to have made arrangements—get a job—that I could make some money for that purpose.

Q. Q. 1740. You were asked a good many questions in cross-examination as to different machines that you had invented, other than telephones, but you were not asked whether you ever invented an Electric Induction Balance, or any improvement therein. I now ask you that question?

A. No, sir. I never invented an Induction Balance. I worked on an apparatus that I used. It could not be called exactly an Induction Balance. It was for trying experiments on coils. That is, on electro-magnets—a balance that you might apply on an armature, and suspend a magnet and a pan for holding weights. It was for the purpose of trying what amount of iron would be best for a certain sized coil. I think that instrument I described in the direct examination, or it may have been in the cross-examination. I don't remember which.

Q. Q. 1741. Did you ever experiment with an Electric Induction Balance to determine the position of a leaden bullet in a wounded man?

A. No, sir. I never did.

Q. Q. 1742. Then when Professor Alexander Graham Bell made his famous experiments on the President with his Electric Induction Balance, and succeeded in locating the bullet where the Doctors thought it was, but at a long distance from where it afterwards proved to be; I suppose you were not called upon to take part in those experiments, were you?

A. No, sir.

Re-cross by Mr. Smith.

Re-cross Q. 1743. At the visits which you and Mr. Jacobs made to Mr. Watts, or either of them, did you have with you the instruments or any of them which have been produced in evidence by the Defendant's counsel, and show them to him?

A. We may have had them along. We generally took them along—some of them. But I don't remember whether we showed them to him. I am positive we did not at the last visit.

Re-cross-Q. 1744. In the re-direct interrogatory 1632 you were asked, "During the year 1877 where were the telephone instruments that you had made prior to that time," and you answered, "They were in the shop," and in the next question you were asked, "Were they capable of being practically operated during that year," and you answered, "Yes, sir." Were these instruments severally in the same condition then that they are now, as they have been produced in evidence?

A. I wouldn't be positive that they were all capable—that is, the tin can, perhaps, may have been broken. As near as I can remember, they were. I don't remember that they were in the same condition then that they are now. As I said before, the tin can may have been eaten by the mice. I don't remember distinctly. I know there were instruments in working condition, and particularly the one next before the one I would be improving on. I can't make it any better than that. By speaking of the tin can as broken, I mean eaten by the mice,—I mean the membrane of the tin can.

Re-cross-Q. 1745. With the exception of the tin can instrument, do you think all the instruments you had in 1877 were in the same condition that they are now?

A. They may not be in the same condition that they are now, because the carbons of some of them are missing; and by use, in taking evidence here, they have been roughly handled.

Re-cross-Q. 1746. Was the fence, about which you were asked this morning, in the same condition when you made the experiment over it, that it is now?

A. The fence has been removed and another fence put there—not a wire fence, but a wooden fence.

Re-cross-Q. 1747. When you were using instrument "F," how did you hold it. Did you hold it vertically, so that the plates and diaphragm were horizontal, or did you hold it up to your mouth, so that the plates and diaphragm would be vertical, or more or less inclined?

A. In using that, you generally placed it on a table and you would place your mouth to it that way (*indicating*). Occasionally I did raise it up, but in raising it up I raised it carefully and kept it vertical. I found that when I held it in an inclined position for some time, the carbon had a tendency to settle to one side and destroy the adjustment-ment. When I said carbon, I meant carbon or low conductor.

Re-cross-Q. 1748. How did you fasten or support the wooden box, which you described for holding the low conductor, when you used the plate, which has been produced with the instrument, supported by a single rod, instead of a stirrup?

A. I would make a little sketch of it, if necessary. The rod supporting it passed down along the edge inside of the tumbler, and was bent over and fastened to the bottom of the wooden box, and secured to the bottom by a small rivet, which rivet communicated or fastened to the inner plate, or lower plate, of the wooden box that was to contain the low conductor. Where I said bent over, bent at right-angles would be more proper.

(*Witness makes sketch which is put in evidence, marked "Exhibit F Box Sketch," and continues:*)

A represents a brass rod, B a wooden box, C the inner metal plate at the bottom of the wooden box, secured to the bottom by a small pin or rivet.

Re-cross-Q. 1749. In your answer to the 488th interrogatory, on page 876 [843], you speak of using a portion of the money you had from Hertzler and others in payment of old debts, to the amount of a thousand dollars or more. To whom did you make those payments?

A. I don't remember to whom. I generally had a great many debts of different kinds—store-bills and bills for flour, coal and wood, fuel—I could not just enumerate, and I could not enumerate the parties I paid it to.

Re-crosss-Q. 1750. Can't you name any of the parties to whom you made those payments?

A. I might name some, but I made payments more than once. If I have to go by the time when I got the money—I can't recollect who had the warehouse where I got my coal—Graybill & Zacharias. I know I paid them for coal. There was a party went by the name of Natcher, who run the mill. I know I paid him about that time. As near as I can recollect there were store bills of parties that had stores. I paid them some money.

Re-cross-Q. 1751. You mean stores at Eberly's Mills?

A. Yes, sir. I cannot enumerate the different bills I made.

Re-cross-Q. 1752. Do you still own the house at Mechanicsburg that you purchased in 1876?

A. Yes, sir.

Re-cross-Q. 1753. Was a wooden box ever connected to the lower plate of "Exhibit F," as it is produced in evidence in the manner in which you represented in the sketch you have just made?

A. Yes, sir. I think so, to the best of my recollection.

Re-cross-Q. 1754. Will you look at the plate and show any indication of its being connected to a box in that way?

(*Witness takes up "Exhibit F" in his hand and says:*)

A. There was a box placed around this—around this lower plate—the plate connected to the rod. The loose plate was immediately above that, with the low conductor between them. There were a number—and I don't remember the different plans, but I know there was a box placed around that—something to hold the carbons. What I mean is, that there was modifications of these plans, and that I don't just remember every modification.

Re-cross-Q. 1755. What I want to know is, how a box for holding the low conductor was attached to this particular plate and rod which is now in "Exhibit F?"

A. As I stated before, by being placed around that. I can't just exactly tell—by friction or cement. In the sketch that I made, I know that that plan I had used.

Re-cross-Q. 1756. Will you state how the bill of J. R. Miller, for coal and freight, which has been produced, and referred to in answer 592, page 896 [862], happens to be made on one of your printed bill heads. Was Mr. Wilson Miller at your shop at the time it was made out?

A. I don't remember whether he was or not. I couldn't say. It may be possible that he was at my shop.

Re-cross-Q. 1757. Do you remember whether or not he ever came to the shop to collect the bill?

A. He came to the shop. He was there several times, and I think he did ask me for money different times. But whether that bill was made out at the shop I wouldn't be positive.

Re-re-direct by Mr. Hill.

Q. Q. Q. 1758. You have stated, in effect, in your re-cross examination, that some of your telephone instruments, which you had in the year 1877, may not have been in exactly the same condition then that they are now, because some of the carbons have been lost out and the instruments have been subjected to rough usage during the taking of this testimony. Were the instruments in as good condition in 1877, as they are now?

A. They were in better condition, I would think—better condition than they are now.

Q. Q. Q. 1759. Mr. John K. Taylor, on printed page 662 [633–4] of Defendant's record, testifies that you paid him between two and three hundred dollars, balance of an old debt that you owed him for some years, and that you made the payment in September, 1867. Do you remember whether that was out of the money that you received from the Faucet Company?

A. I don't remember; it may have been; I can't remember the different payments.

Sworn and subscribed to before me, this 20th day of February, A. D. 1882.
FRED. M. OTT,
Examiner.

DANL. DRAWBAUGH.

C. E. UPDEGRAFF *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

My age is thirty-eight; my residence 263 South Third street, Philadelphia; occupation now, dealing in sea-shells. I know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Penna., and have known him since about May, 1874.

Q. 1. State the circumstances under which you first became acquainted with him?

A. In May, 1874, I had been to Dillstown. I was then practising medicine. I went to Dillstown to operate on a case of cataract. I had an office at that time in Harrisburg, at the corner of Front and Market streets. As I was very fond of hunting and fishing I took a gun with me, and on my return from Dillsburg I went back by the way of Siddonstown. I think that is in Cumberland county. I stopped at Siddonstown over night to see a patient there—a blind girl. I shot along the road game, etc., as far as Eberly's Mills. That was on the next day. I drove down by the mill, along the creek, inquiring after what the probabilities were of catching some frogs, in case I went over for that purpose. I stopped at the mill to inquire. I went into the mill and found Mr. Drawbaugh there. I inquired about the prospects there of frogs and fishing. I seen some machinery there of different kinds. I was always interested in anything in the way of machinery, and it drew my attention. We got on to the subject then of machinery and inventions—the conversation—and he told me that he was an inventor and was getting up, as he expressed it then, a talking-machine. We had a general discussion on electricity and he showed me some of his things he was getting up there for his talking-machine; I suppose we talked there, probably three-quarters of an hour. I then left and came home,—drove over to the city.

Q. 2. Was any one with you on that visit to Dillsburg, if so, who?

A. Thomas Updegrove, of Harrisburg.

Q. 3. Have you refreshed your memory in any way as to the date of that visit?

A. Only from my book account of my visit over there. And I settled it more particularly to-day from the livery stable book, where I got the horse. It was from Mr. Cummings. I didn't see the book; he told me. I asked him whether he had made an entry of it, and he said he would look, and he afterwards told me that an entry had been made of it; the fifth of May, 1874, he said.

Q. 4. Did you afterwards make another visit to Mr. Drawbaugh's shop. If so, when was your next visit?

A. It was about the 20th of April, 1875—from the 18th to the 20th. I get that from my book, from an account I made of a young man I was treating at the time, which was J. M. Boyle, a printer, here in the city. I remember that particularly, because I advised him to quit work and go into the country, and he went with me over there. That was a day or two after I commenced treatment. It was a case of lead poisoning, and I advised him to get out of the printing office. We went to Zacharias' mill. That, I judge, was about three, four, or may be, five miles above this mill where Drawbaugh was. We camped there the first night. Next day we took our boat, a new thing that I had gotten up, that could be used as a boat or folded up and carried—and we put our boat in the river and went down to Eberly's Mills, and we fished and gunned all the way down the stream—upset once or twice. We pitched our tent on a little island at Eberly's Mills, in the creek, and fished about there until evening. It was pretty cold weather and Mr. Drawbaugh came down and tendered us the mill as a place to sleep in. As the evenings were cold we accepted his invitation. We got on to the subject there of electricity and talking-machines, and we talked pretty near all night on the general subject of talking-machines, electricity, inventions, and one thing and another. He showed me the different apparatus that he had and explained to me the manner of its working, and all he wanted then was some one to go into it with him and put money into it to get it patented and then he could use it instead of telegraphing, without an instrument; that is, instead of using the old mode of telegraphing; he could talk directly through the wire.

I rather doubted his machine. I thought he was, maybe, going too far. I know sometimes men get gone on inventions, and I thought he was, maybe, one of that kind of fellows. He said he could prove it. He fetched us some machinery, and we talked through it, and he explained it to me then, or tried to, and we talked through it. The wire was then run out, as I thought, to the house, but I don't think it was; I think it was only run out to one of the sheds. We then had a general conversation on the internal organization of the ear, and he had an instrument there that more particularly attracted my attention on account of the peculiar shape of the magnet. I had never seen anything like it before. It had a magnet of a peculiar shape. We talked until pretty near on to morning, when I suppose we were both pretty well talked out, and he then went to the house, or went out. I suppose he went to the house. We fished about there the next day and had pretty good luck, and then came home.

As to Zacharias mill, I only know that Zacharias was the man who run the mill or attended to it. I don't know whether it was his mill or not, but think he was only the miller there.

Q. 5. Where was Mr. Boyle during that conversation at night in the mill?

A. He was in the mill with me. After talking an hour or so, he laid down and went to sleep.

Q. 6. Where does Mr. Boyle now reside?

A. At Cincinnati, Ohio.

Q. 7. What peculiarity was there about the shape of the magnet that you referred to which attracted your attention?

A. It resembled the ear—the external part of the ear—in shape.

Q. 8. Was anybody there with you except Mr. Boyle on that occasion?

A. No, sir.

Q. 9. Did you afterwards make a third visit to Mr. Drawbaugh's shop? If so, when and under what circumstances?

A. I went over there with a party about the middle of May of the same year.

Q. 10. Who were the parties?

A. Mr. Smith, Mr. McGaffick, and Mr. Boyle.

Q. 11. Can you give Mr. Smith's name and place of residence?

A. I think it is J. H. Smith, 1027 Buttonwood street, Philadelphia, but at that time he lived here. He kept a hotel here by the depot.

Recess until 7.30, P. M.

Feb. 20, 1882, 7.30, P. M.

Examination resumed, pursuant to adjournment.

Present, Mr. Storrow for Complainants, and Mr. Hill and Mr. Jacobs for Respondents.

Examination of C. E. Updegraff by Mr. Hill continued:

Q. 12. Please describe what took place at the time of your visit to Mr. Drawbaugh's shop in May, 1875, in company with Messrs. Smith, Boyle, and McGaffick.

A. We went there on a fishing excursion. We camped on that island near the mill, and fished all that day and that night. In the morning, Mr. Smith and myself went up into the town to lay in a stock of provender. On our way down from the town we stopped into the mill to see Mr. Drawbaugh. We had a conversation with him about his talking-machine. I asked him how his talking-machine was getting along, I believe. I think I drew Mr. Smith's attention to the machine. The general conversation was on the machine and on his getting some person to go in with him to—what he wanted was means, or somebody with means—to procure the patent and put it before the people. I suppose we were in conversation an hour, maybe more, at that time. We left there, I think, during the forenoon. We were only there one night.

Q. 13. Was that your last visit to Mr. Drawbaugh's shop prior to the beginning of this suit?

A. I think it was my last visit there. I may, possibly, have been there within a short time after that, but I don't think I was, for we went fishing up in the other direction after that—up by Dauphin.

Q. 14. What is the lawful fishing season for this region?

A. For trout, is from April until June, I think, is the season. Other kinds of fishing you can fish all the year. There is a season for bass and all game fish, but not for ordinary fish. My fishing was for frogs ordinarily.

In reference to that first visit. I mentioned it was on the fifth of May. It was the fourth according to Cumming's book account.

Q. 15. Are you positive that that first visit was in May 1874, the second visit April 1875, and the third visit a short time after the second?

A. Yes, sir.

Q. 16. Did you see Mr. Drawbaugh's talking machines on each of these three visits?

A. On each of those three visits.

Q. 17. Did you talk or hear anybody talk through the machines on your first visit in May 1874?

A. I won't be positive as to that. My impression is that I did.

Q. 18. Did you on your last visit, a short time after the visit of April 1875?

A. I won't be positive as to that. I can't say.

Q. 19. Are you positive that you talked through it or heard Mr. Drawbaugh talk through it on your visit with Mr. Boyle, in April 1875?

A. Yes, sir.

Q. 20. Do you remember whether you and Mr. Drawbaugh were in the same room when you were talking and listening through the instruments?

A. Yes. We were at several parts of the room. At one time I know that I put my hand to my ear, to be positive that I didn't hear the sound only through the machine.

Q. 21. Did Mr. Drawbaugh, at any time, go into another room, or another part of the shop and talk to you through the machine?

A. He went to another part of the shop. I think that we were at the extreme ends of the shop, he at one end and I at the other, so that I was positive that I couldn't hear him speak, only through the instrument.

Q. 22. Do you remember whether he went down stairs and spoke through the instrument while you remained above?

A. I couldn't say.

Q. 23. I understand you, that you are positive that the sound which you heard came from the instrument.

A. Yes.

Q. 24. How many different talking machines did Mr. Drawbaugh show you at the time of your first visit with Mr. Updegrove.

A. It was—his apparatus then was a rather rough arrangement. It was a tin arrangement fastened through a board with a helix, I think inside of it. There was also another that looked about as much like a cuspidor as anything, only that it hadn't as much flange on top as a cuspidor. Then there was another machine there that had a horse shoe magnet—I don't remember the construction, and at the same time there was a tin box, or something like the lid of a box at the end of that. I think there was a mouth-piece or some kind of an opening at the end of that.

Q. 25. Please examine the instruments, "A," "B," "C," "D," "E," and "I" together with the "instruments B reproduced," "C reproduced," and "F reproduced," and state whether or not you recognize any of them as being the instruments which you saw, at the time of your first visit to Mr. Drawbaugh's shop in May 1874?

A. [*Witness takes up instrument* "*C*" *and says:*] My recollection is, this was the machine, but I think there was a magnet on it like this [*pointing to magnet on* "*C reproduced.*"] I think that is the very instrument. My impression is that the magnet on it was a little smaller than the magnet here [*referring to magnet of* "*C reproduced.*"] [*Witness then takes up instrument* "*B*" *and says:*] This is the instrument that I think I saw. [*Witness takes up instrument* "*I*" *and says:*] The cuspidor arrangement was something similar to that. I could not say whether that was the one. Those are all, I think, that I saw at that visit. There may have been more, but I don't remember. I won't to too positive.

Q. 26. Have you, or not, any recollection at that first visit of seeing instrument "A?"

A. I can't say. I have seen an instrument similar to this [*indicating* "*A,*"] but I could not say whether it was the first visit or the second.

Q. 27. Will you please examine all of said instruments once more, and state whether you identify any of them, and if so, which ones, as among the instruments seen by you at Mr. Drawbaugh's shop, at the time of your second visit there, to wit, the visit with Mr. Boyle, in April 1875?

A. I seen an instrument similar to that [*taking up* "*D*"]; that is with that peculiar shaped magnet. It resembles the external portion of the ear. That is the one I referred to before as resembling the ear. I saw something of this kind [*taking up* "*F*" *and* "*reproduced F*"]. I know that he was working with plaster-of-Paris, and was fixing something of this kind with plaster-of-Paris. I think I seen this instrument [*taking up* "*B*"]; in fact, I think I seen all the instruments here, or similar iastruments to them. That I do not think I saw [*referring to* "*B reproduced.*"]

Q. 28. I understand you that you saw this instrument "A" either at your first or second visit.

A. I think I did.

Q. 29. Do you remember which instrument you listened at when Mr. Drawbaugh was talking to you through the machines?

A. I don't know that I could identify that. We handled them all, and I couldn't say positively which ones—I couldn't say which ones I listened at.

Q. 30. When you listened and Mr. Drawbaugh talked into the other end of the line, could you distinctly hear and understand what he said through the machine?

A. Yes; I could hear so as to understand what he said.

Q. 31. Do you remember what particular machines you saw at the time of you third visit, when the fishing party were with you?

A. I think I seen them all.

Q. 32. Am I to understand you that on each occasion when you were there, Mr. Drawbaugh spoke of his want of funds and of his desire to get somebody to take hold with him and invest money to get the talking-machine patented and introduced.

A. That seemed to be the great trouble—the want of money. I think that each time he talked about his trouble, that he didn't have the money to patent it.

Q. 33. You have said that the subjects of electricity and mechanics generally were talked over at those times between you and Mr. Drawbaugh.

A. Yes; the subject of electricity seemed to be his hobby.

Q. 34. What particular machines or inventions of his did he seem to be most interested in and have most at heart?

A. His talking-machine.

Q. 35. Was there any conversation between you and him on any of those visits as to the distance through which he could talk by means of his talking-machine?

A. He thought he could talk as far as you could use the ordinary telegraph wire.

Q. 36. Was there any discussion as to what particular uses might be made of the invention, and how did that discussion arise, if there was any?

A. I thought it would be a grand thing for hotels. Instead of the electric bells, or the bell ropes, and instead of having anybody run up to the rooms for an order, they could talk it direct to the office.

Q. 37. What did Mr. Drawbaugh say about the particular uses that could be made of the machine, other than telegraping on long tines?

A. In running, for instance, from a house to a shop, or through a large factory, or from house to house. But in large factories, he thought it would be cheaper and to better advantage than the pipes that were run from floor to floor.

Q. 38. When did this part of the conversation take place,—at which visit?

A. The second visit was the general conversation. Everything that could be said about his invention was said, I think, that night; that is, on the second visit--the visit with Mr. Boyle.

Q. 39. Do you recollect whether Mr. Drawbaugh told you how long he had been working with talking-machines?

A. He said he had been working several years on it. I don't know that he mentioned the time, but I inferred that he had been working six or seven years on it, if not longer.

Q. 40. Were the talking-machines, that you saw then at his shop, operated by electricity?

A. Yes, sir.

Q. 41. Do you know how the Defendant's counsal, Mr. Jacobs, came to know that you had any knowledge of the invention of Mr. Drawbaugh?

A. Yes, sir; I think I do.

Q. 42. State how it was, and when.

A. I picked up a paper one day, or rather Mr. Boyle called my attention to an article in a paper, stating that that was the place, and the mill we had been at, and the machine we had talked through. Mr. Boyle was then a partner of mine in business in Philadelphia. That was in the neighborhood of a year ago. I talked frequently of this, and, I think, about six weeks ago I picked up a paper and seen the articles mentioning something of the case being tried here, or of taking testimony here. I talked with several people in the store about it and several of them advised me to write to Mr. Jacobs, or the attorneys, and let them know what I knew about it. I did. I wrote, stating the fact that I was acquainted with Mr. Drawbaugh, and knew of the machines being there, and if my evidence could be of any use they could have it.

Q. 43. Did Mr. Jacobs afterwards go to see you with reference to it?

A. Yes, sir.

Q. 44. Did you know whether Mr. Jacobs went to see Mr. Smith with reference to his visit there with you, and, if so, how Mr. Jacobs came to know about Mr. Smith, and when it was he became acquainted with him, and how?

A. I think he did. I told him that Mr. Smith was with me on one occasion over there fishing, and that he was acquainted with the working of the talking-machine, and that I thought he probably knew a good deal about it and would be an important witness. I can't say when he became acquainted with him, but it has been within the last five or six weeks. I suppose he became acquainted with him by going to see him in consequence of my statement.

Q. 45. When Mr. Jacobs asked you to come here and testify, did he ask you to bring your books and verify the dates?

A. He did.

Q. 46. Did you bring them?

A. I did not. I got them out to bring, but came out and forgot them. I left them lying on the desk in the store.

Q. 47. Did you examine them to verify the year and dates of your visits?

A. Yes, sir; on three or four or a half a dozen times.

Cross-examined by Mr. Storrow:

Cross-Q. 48. Why did you examine them so many times?

A. Mr. Jacobs was down to see me three times at least, that is he was in to see me three or four times when he was in the city; and each time he was there we looked over the books. I think he was in twice on one day.

Cross-Q. 49. What occasion was there for you and Mr. Jacobs to look at the books so many times?

A. He would ask me about the dates and I would look at the books.

Cross-Q. 50. Wasn't he satisfied with the answer you gave him the first time, when you looked at the books?

A. I think he was.

Cross-Q. 51. How long did you live in Harrisburg?

A. I lived in Harrisburg nearly four years.

Cross-Q. 52. When did you move away?

A. I moved my family away on the first day of February, 1877, but I had been away from early in the spring of 1876. All through Centennial year I was at Philadelphia, but my family was living here.

Cross-Q. 53. Where did you live in Philadelphia during the Centennial year, and what was your occupation?

A. At 215 Pine street. I was manufacturing revolving kaleidoscope lamps.

Cross-Q. 54. How long did you live at 215 Pine street, and where did you live next?

A. I lived there until I moved my family down in February, 1877. I boarded there and had my place of business there. I next lived on Fourth street, just above Pine; I can't remember the number.

Cross-Q. 55. How long did you live there, and where did you move to next?

A. I lived there one year, I think; I moved from there to Fourth street, just below Spruce; 337 is the number.

Cross-Q. 56. How long did you live there and where did you move to next?

A. I kept my place of business there until, I think, in—I moved my family, I think, three months before that—I think, in September of 1879—to Tenth and Callowhill.

Cross-Q. 57. How long did you live there and where did you move to next?

A. I lived there till the spring—I guess it was June of 1880, I think.

Cross-Q. 58. How long did you live there and where did you move to next?

A. I moved to Third and German.

Cross-Q. 59. How long did you live there?

A. I think I lived there until the tenth of August, 1880.

Cross-Q. 60. Where did you move to then?

A. 263 and 265 South Third street. It is all one property—a large double property.

Cross-Q. 61. How long did you live there?

A. I am living there now, or was when I left there Sunday morning.

Cross-Q. 62. How long did you carry on the business of manufacturing kaleidoscope lamps?

A. I carried it on up until some time after I moved my family down. I made them until some time in 1878.

Cross-Q. 63. What was the first business you took up after you moved your family down, in addition to those lamps?

A. I went into manufacturing silk and felt hats. I started a party in business there. He run the business.

Cross-Q. 64. What was the next business you took up?

A. The next business I took up was the shell business.

Cross-Q. 65. When was that?

A. That was shortly after I moved to where I now am. I did no business from December, 1879, up until August, 1880, except nurse my family. That was the time they were burned.

Cross-Q. 66. Where did you carry on the hat business?

A. On Fourth street; at both places where I lived. They were only a short distance apart. In the same buildings that I lived in. The stores were underneath and the dwellings were above.

Cross-Q. 67. Where did you live in Harrisburg?

A. I lived at Front and Market, and Fourth above Market, just next to the Express office. The first place I lived was Second, below Locust. 222, I think, was the number. I moved from there to Front and Market, then to Fourth and Market, and from there to Fourth, above Market, and from there to Philadelphia.

Cross-Q. 68. What was your occupation while you were living in Harrisburg?

A. Practicing medicine, or rather surgery. I made a speciality of diseases of the eye and ear.

Cross-Q. 69. What led you to devote your time to frog-fishing?

A. It rather run in the family, I think. I am rather fond of them to eat.

Cross-Q. 70. What was the name of the person you went to visit at Dillsburg, whom you have referred to?

A. I can't remember the name of the Dillsburg patient. It was on the other side of Dillsburg.

Cross-Q. 71. Didn't you find the name when you and Mr. Jacobs examined your books?

A. I did, but the entry was made of the time the operation was performed here at the White Hall Hotel. He stayed here a couple of weeks. The entry in my books is made of my visit to Siddonstown. I stopped there on my return from Dillsburg.

Cross-Q. 72. What was the name of the patient at Siddonstown?

A. Barbara Raffensberger.

Cross-Q. 73. At your second visit, which you say you made to Mr. Drawbaugh's shop, when you stayed there all night, what other things did you see besides the talking machine?

A. There was machinery there of different kinds—lathes, and wood turning machines, and tools that are generally used about a tinker's shop, where they made anything and everything. At that time I think he showed me an axle and told me they were going to start the manufactory and were fixing up for these wagon axles there in that building.

Cross-Q. 74. I wish you would name everything that you saw in the shop that night?

A. I seen some work benches, some files, drills, and an axe, some planes, chisels, rasps, lathes, pulleys, some of his talking-machines, plaster-of-Paris and some scrap iron lying around on the floor, some axles—two or three, I think,—some telegraph wire, some nails. There was an old coat hanging there, too. I took that down and laid on it. There was pieces of machinery lying around there that I didn't examine; some wood work. I could not tell what it was. In a shop of that kind it would puzzle a Philadelphia lawyer to tell what was in it.

Cross-Q. 75. What was the name of the Mr. Boyle who was with you?

A. Joseph M. Boyle.

Cross-Q. 76. When was he in business with you?

A. He was in the shell business with me from the fall of 1880, until the summer of 1881, when I bought him out.

Cross-Q. 77. Do you know what he did after he left you?

A. After leaving me he worked at printing in Philadelphia, at a printing establishment on Seventh street, below Race. I forget the name.

Cross-Q. 78. Do you know where he went after that?

A. He went from there to Cincinnati.

Cross-Q. 79. The first time you say you two stopped at Mr. Drawbaugh's shop, did you talk through any of his talking-machines?

A. I can't say positively that I did. I am rather under the impression that I did.

Cross-Q. 80. Which instruments do you think you used for receiving?

A. I couldn't tell you. I know I looked over the different ones, but I don't think I could tell which one we did use.

Cross-Q. 81. Which do you think you used at the time when you say you spent the night there?

A. We used them all. I think those, or machines similar to every one on the table, were used there. I could not say which ones were used, as it was a general discussion.

Cross-Q. 82. Can't you recollect the one you listened at?

A. I think that curled instrument ("D"), or something similar to that, was one that I listened at.

Cross-Q. 83. Did you listen at others?

A. Yes; I think I did. They were changed around—different ones during his talking—he took them off the wires—detached them and put on others.

Cross-Q. 84. Did you talk into any of the instruments on that occasion?

A. Yes, sir; I think that farthest machine there [*indicating* "C."]

Cross-Q. 85. Which one did he talk into?

A. I think in the same machine. In fact, I—I don't know—I think he had two machines, similar to "C."

Cross-Q. 86. Have you been at Drawbaugh's shop within the last six months?

A. Not until yesterday.

Cross-Q. 87. Who went with you yesterday?

A. Mr. Jacobs and I drove over, or rather I went with Mr. Jacobs. He drove me over.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 20th day of February, A. D. 1882.
FRED. M. OTT,
Examiner.

C. E. UPDEGRAFF.

February 21, 1882, 10, A. M.

Examination resumed, pursuant to adjournment.

Present, Mr. Storrow for Complainants, and Mr. Hill and Mr. Jacobs for Respondents.

JOHN HENRY SMITH, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

I am almost forty-nine years of age; I live in the city of Philadelphia, at 1027 Buttonwood street; I am what you might call a cordwainer by trade, otherwise a shoe finisher. I have seen Daniel Drawbaugh, of

Eberly's Mills, Cumberland county, Pa., in May, 1875. I have not seen him since, except once in Philadelphia, about three or four weeks ago. I had no previous acquaintance with the man.

Q. 1. What business were you engaged in in May, 1875, and where?

A. I was engaged in the hotel busines, keeping the Valley House near the lower end of the depot, in the city of Harrisburg. It was the property of Mr. Kunkel, and I rented from him.

Q. 2. How long have you lived in Philadelphia?

A. The last time I moved from here, in September, 1880, just before the Presidential contest. Previous to that I had lived in Philadelphia—had been almost raised there. I moved from Philadelphia to Harrisburg, about July 3, 1866. I came here to take charge of Forney & Miller's shoe factory.

Q. 3. State the circumstances under which you first became acquainted with Mr. Daniel Drawbaugh, about the middle of May, 1875?

A. In the year 1875, Mr. Updegraff, Mr. Boyle, and I, being all residents here, and I having become acquainted with those gentlemen from their being visitors at my place of business, and I being fond of hunting and fishing, they having been over there three or four weeks previous, we made a party up and went over there and encamped for a night, and came home the next day. We left here in the afternoon and went over to Eberly's Mills, as some of us called it; others called it Milltown. We fished almost all night. I don't think the Doctor and I slept at all that night. On the next morning we built a fire and prepared our breakfast. We went up to a farm-house to get some milk for our coffee, and from there to a grocery store to get some other things that we needed. Doctor and I went—the others remained on the island where we were encamped. After we had provided what was necessary we went down and got our breakfast. The Doctor then proposed, after breakfast, that we should go up and see an old gentleman named Drawbaugh, who was a genius around there, who had something like a talking-machine. Doctor and I started from the island to the mill, leaving the others. None went but us two. Doctor went ahead and opened the door. On the first floor were a lot of shafting and pulleys, some iron lathes and rather heavy machinery. Mr. Drawbaugh was not there. We then went on to the second floor, which is more like a carpenter shop—a wood shop. Dr. Updegraff went in—Mr. Drawbaugh was in there—and introduced me as Mr. Smith, and we shook hands. He asked him, says he: "How are you getting along with your talking-machine?" The words that passed between them

I hardly recollect, but Mr. Updegraff and he went over to a bench, where he got out a number of these machines. I followed after them, out of curiosity, to see what they were. They looked over them and seen what they were. I had one or two of them in my hand. I didn't take the interest in them that Dr. Updegraff did, or Mr. Drawbaugh. I suppose we stopped in there a half an hour, or may be an hour; I am not positive as to the time. They were examining these instruments he was speaking of. After that we came out and wandered about there awhile and fished, and Doctor and I had a conversation about what Drawbaugh intended to accomplish by this machine. It was intended to convey sound from Philadelphia to New York, or Baltimore, or quite a long distance. I am positive I asked him how he knew, and he replied, "I have tried it; I have talked through it." He went on, "If he accomplishes what he expects to do with it, why he will make a fortune," and he, the Doctor, said he didn't think Drawbaugh had the money, and that some parties would probably get hold of it and make a good thing out of it.

Q. 4. Please look at the instruments "A," "B," "C," "D," "E," "F," "I," "F reproduced," "C reproduced," and state whether you recognize any of them as machines which you saw at the time of your said visit, or as being the same in appearance as machines which you saw?

A. There was one machine like "C" with a horse-shoe magnet on it like the one on "C reproduced." This one [*indicating "A"*] was one I had in my hand, and my thorough recollection of it was that it had a concern on it like the mouth-piece of a bugle—probably not this machine, but one just like it. I would not be willing to take my oath that this is the one. I think I have seen one like that [*indicating "D,"*] and something was there resembling a bomb-shell, [*indicating "I."*] I think I saw this machine [*taking the cover off "I" and examining it.*] I saw tumblers there, and asked him what he was doing with those tumblers. He had plaster-of-Paris, or something like that in that tumbler. This [*indicating "B"*] is not like the one that I saw. It had a piece of thin white skin or something of that kind covering this end. [*indicating the end of the tin can of "B" next to the electro-magnet*]. It looked to me like thin white bladder.

Q. 5. Do I understand you that you saw a machine very like "B," if the latterr had a piece of bladder over the end next to this electro-magnet?

A. Yes, sir; the reason for remembering that was that this part [*indicating the tin case of "B"*] seemed to be made out of tin. "B," "C," and "I" are the tumblers I particularly remember; the others I wouldn't be positive about.

Q. 6. I understand you that you remember seeing a machine that looked like "A," although you would not swear that "A" was the same machine?

[*Objected to as leading.*]

A. Yes, sir.

Q. 7. Do you remember that the machine that you saw that had a mouthpiece like a bugle was a flat round machine with a mouth piece on one side of the centre?

[*Same objection.*]

A. It was a round piece like this—[*taking "A" in his hand*]—and had a mouthpiece like this on it.

Q. 8. Is there anything about the machine "D" that calls to your recollection any instrument that you then saw there?

A. There is nothing particularly about this that makes me remember any more than I would remember a machine by picking it up. I almost forget whether there was a piece in it—[*witness looking into the mouthpiece while stating the last clause above.*] It looks to me like a machine of this kind that I had seen over there.

Q. 9. Please look at the permanent magnet on instrument "C reproduced" and state how that compares with the magnet which you say you saw on the machine "C?"

A. This magnet, not having it in my hand, but only looking at it as I do now, looks to me to resemble the one that I saw there.

Q. 10. Please look at the electro magnets on machine "C reproduced" and state whether you have any recollection of anything of that kind being on the machine "C" between the permanent magnet and the tin?

A. I have a distinct recollection of two spools-full of a white substance—I couldn't say whether it was thread. They were in the same position that they are there; but I couldn't say whether they were fastened down by a screw or not. I couldn't say because I did not take them in my hand. I judge they were fastened down. I simply watched their movements as they explained to eachother just as I am standing here now—Mr. Drawbaugh explaining to Mr. Updegraff. I am satisfied they were not loose, for we had them in our hands handling this way [*indicating*] and they would have rolled off if they had been loose. I meant by not having them in my hand that I did not have the spools in my hand, and did not attempt to take them off. I had the machine in my hand.

Q. 11. Do you remember whether the permanent magnet was loose as it is here, on "C reproduced?"

A. I do not, sir.

Q. 12. Have you ever been in that shop since that visit of May, 1875?

A. Never, sir, before or since.

Q. 13. Referring to the conversation which you had with Dr. Updegraff on the same day after you went out of the shop, was there any talk in that conversation about the particular uses which the machine was adapted to?

A. There was this about it, that during the conversation Dr. Updegraff told me that a person could have a concert, or something of that kind, in New York, and you could sit in your own house at Harrisburg and hear as well as if you were there. That is what he conveyed to me was the intention of the talking-machine. It was a machine to carry sound a long distance.

Q. 14. Was there anything said in that conversation about the use of the machine for short lines for any purpose?

A. That I could not say, sir.

Q. 15. Was the machine referred to in your interview with Drawbaugh, and in your conversation with the Doctor on the same day, as a machine which would convey spoken words a long distance or only musical sounds?

[*Objected to as leading.*]

A. I had understood it to do both—as a machine that you could talk through as well as you could hear singing.

Q. 16. In one of your answers referring to the conversation which you had with Dr. Updegraff after you left the shop, and on the same day, you state that the Doctor said, "If he," meaning Drawbaugh, "accomplishes what he expects to do with it, why he will make a fortune." From the conversation at the time, what did you understand the Doctor to mean by Drawbaugh accomplishing what he expected to with the machine?

[*Objected to as hearsay and incompetent.*]

A. My impression was that, should the machine get into general use, the machine would be financially a success. That was the impression I got from the conversation.

Q. 17. Then, what Drawbaugh expected to accomplish was to get the machine into general use, is that your idea?

[*Objected to for the same reasons as above, and as leading.*]

A. That was my idea.

Cross-examined by Mr. Storrow:

Cross-Q. 18. In your 3rd answer, you say that when Mr. Updegraff and Mr. Boyle proposed to you to go with them on the occasion you have described, they had been over there three or four weeks previous. Do you refer to an excursion in which Dr. Updegraff and Mr. Boyle floated down stream in a canvass canoe, and which Dr. Updegraff described in his testimony yesterday?

A. As regards the canvass boat, I was not along; but as regards their excursion for frog-fishing, that is the visit there three or four weeks previous that I refer to. As to the boat, I was not there, and I did not hear his testimony in regard to that at all. At that time I was out.

Cross-Q. 19. You were present during most of last evening while Mr. Updegraff was testifying, were you not?

A. Yes, sir; part of it. I forget the time. I think it was in the neighborhood of 11 o'clock.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 21st day of February, A. D. 1882.
FRED. M. OTT,
Examiner.

J. H. SMITH.

THOMAS UPDEGROVE, *being produced, sworn, and examined, saith:*

Examined by Mr. Hill:

My age is forty; residence, Harrisburg; occupation, carpenter.

Q. 1. How much acquaintance have you with Mr. Drawbaugh?

A. Nothing but what few words I spoke to him in the mill or shop.

Q. 2. How many times were you over at his shop at Eberly's Mills?

A. Once.

Q. 3. When was that?

A. That was in the spring of 1874.

Q. 4. Are you able to fix the exact day?

A. I would be now, but I would't have, only on account of one circumstance.

Q. 5. What circumstance was that?

A. Asking Mr. Cummings whether he had the day that Mr. Updegraff hired the carriage from him.

Q. 6. State how you happened to visit Mr. Drawbaugh's shop at that time.

A. Dr. Updegraff asked me if I would take a ride with him to see a patient of his, and we would take a gun along. I said I would. We went to Dillstown, and five mills beyond Dillstown. We took dinner there, and he attended to his patient. We started from there after dinner to Siddonstown, and stayed there over night. In the morning, we started for Harrisburg. He had a patient in Siddonstown; I forgot to say, a lady there. We stayed with them over night. On our way back, we got to this mill. Doctor got into conversation with this gentleman, and we got up into the shop and there he was explaining some machinery to the Doctor. We stayed there a while—I couldn't state how long—and started then for home.

Recess for dinner until 2, P. M.

Feb. 21, 1882, 2, P. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Examination of Thomas Updegrove by Mr. Hill continued:

Q. 7. Is the town beyond which you went on that trip sometimes called Dillstown and sometimes Dillsburg?

A. Yes, sir; I have heard it called both.

Q. 8. Is the same true of Siddonstown? Is it sometimes called Siddonsburg?

A. Indeed, I don't know. I was never in the town before.

Q. 9. Please look at the instruments now on the table, marked "A," "B," "C," "D," "E," "F," "I," and "reproduced C," and "reproduced F," and you state whether you recognize any of them as being instruments that you saw at Mr. Drawbaugh's shop on that visit, or as being similar in appearance to instruments which you saw there?

A. I saw something like that [*taking up* "*B*"]; I couldn't say whether it was this one; but it was something very much like it. I remember the tin part and this here [*taking up* "*I*"]—I remember this very distinctly. I seen a machine like this also, [*taking up* "*reproduced C,*"] I don't know whether this is the one, but it was something in that order, with a magnet on like that. I don't recollect anything at all about that one [*indicating* "*F.*"] These things here [*indicating* "*A,*" "*D,*" "*C,*" *and* "*reproduced* "*F,*"] I never saw—not to my knowledge.

Q. 10. Please look at "reproduced "C" and state whether the machine which you saw there resembling this one and having a magnet on it had also the spools wound with something arranged between the magnet and the tin, or do you remember that?

A. The spools—I recollect those. I could not state whether they were wrapped or how they were fixed; it was so long ago; but I can say it resembles what I seen.

Q. 11. Do you remember whether the spools you saw there on the machine were between the magnet and the tin?

A. I couldn't say exactly in regard to that; I didn't take very close observation.

Q. 12. How did the magnet compare with that magnet on "reproduced "C."

A. It was about that shape; as to the size, I could not say; it was a "U" magnet.

Q. 13. Did you remain in the room with Dr Updegraff and Mr. Drawbaugh during their entire conversation, or not?

A. No, sir; only part of the time?

Q. 14. Were you there during the first or last part of their conversation?

A. The first part. I went out then and waited until he came. I didn't feel interested in the machinery, as I didn't think it would amount to anything.

Q. 15. Have you any knowledge on the subject of electricity?

A. No, sir.

Q. 16. Do you remember whether Mr. Drawbaugh, at that time, stated that it was operated by electricity or not?

A. I wasn't paying altogether particular pains to their conversation; I was fidgeting to get home; I was in more of a hurry than Doc. was; I do not remember.

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Q. 17. Did anybody talk through the machine while you were in the shop examining them, with Mr. Drawbaugh and the Doctor?

A. They were doing something with them just as I was about going out. They were putting them in some kind of shape, or doing something. I went out to where the horse was, and I don't know whether they talked through them or not.

Q. 18. Where were the machines when you and the Doctor first went into the shop?

A. They were on the work-bench.

Q. 19. After the Doctor came out of the shop I suppose you and he came immediately home, did you?

A. Yes, sir.

Q. 20. Did you have any conversation with the Doctor about the machines, as you were going home?

A. Yes, sir.

Q. 21. What did the Doctor say to you about them?

[*Objected to.*]

A. He said it was a very ingenious kind of a thing. He thought it would answer for some purposes, but didn't think it likely to answer for all the purposes that Mr. Drawbaugh expected it would. He said that talking from one town to another was more than he thought it would do. It might do in hotels, he said.

Q. 22. Did he tell you that he had talked through it or heard Mr. Drawbaugh talk through it while they were in the shop together?

A. I understood from his conversation in the carriage that he had some idea of its working.

Q. 23. He might have gotten some idea of its work from Mr. Drawbaugh's statements. What I asked was whether the Doctor told you in the carriage as you were going home whether he, the Doctor, had talked or listened through it or not?

A. I can't recollect that he did.

Q. 24. Do you remember whether you inferred that he had from his conversation?

A. I can't say, but he appeared to have some idea of it. That is all I can remember now.

Cross-examined by Mr. Storrow:

Cross-Q. 25. Where do you live now?

A. 305 South Second street.

Cross-Q. 26. Where do you work now?

A. I am working for myself now.

Cross-Q. 27. Have you got a workshop of your own?

A. No, sir; I had two years ago.

Cross-Q. 28. How long had you known Dr. Updegraff before you went on this expedition with him?

A. Since about 1868.

Cross-Q. 29. How much had you known him?

A. Very little in 1868. After 1870, I knowed him continually—was with him a great deal. He doctored me.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 21st day of February, A. D. 1882.
FRED. M. OTT,
Examiner.

THOMAS UPDEGROVE.

[*Mr. Hill states that Mr. Storrow yesterday requested that Harmon K. Drawbaugh, a witness heretofore examined for Defendants, and whose deposition was closed, be reproduced for the purpose of allowing Mr. Storrow to ask some ten or twelve additional questions. Mr. Hill now recalls the witness for that purpose, but not for a general cross-examinatian, nor for a cross-examination upon matters upon which he has already been cross-examined in his former deposition.*]

HARMON K. DRAWBAUGH, *recalled.*

Cross-examined by Mr. Storrow:

Cross-Q. 1. Did you testify as a witness in the interference case between David A. Hauck and Daniel Drawbangh?

[*Objected to by Mr. Hill as irrelevant, immaterial, and as matter not referred to in the direct examination.*]

A. Yes, sir.

Cross-Q. 2. I now hand you what purports to be one of the original printed copies of the evidence on behalf of David A. Hauck in said case, and ask you to look at what is printed as your deposition therein, beginning on page 8 and ending on page 24, and to state whether the statements therein contained purporting to be made by you are correct and true, according to the best of your recollection, and if they are not, will you please to make any correction or explanation which you may desire?

[*Objected to as immaterial, irrelevant, and incompetent, and as matter not referred to in the examination-in-chief, and the deposition in the Hauck case is objected to for the same reasons, and because this method of introducing it is entirely irregular.*]

[*Witness reads the deposition and says:*] I don't think there is anything in there that I would wish to correct.

[*Complainant's counsel puts in evidence said printed deposition referred to by the witness, to be marked "Exhibit H. K. Drawbaugh's deposition."*]

[*The introduction of the deposition objected to by Mr. Hill for the same reasons above stated.*]

Examination taken, reduced to writing, and by the witness subscribed to before me, this 21st day of February, A. D. 1882.
FRED. M. OTT,
Examiner.

H. K. DRAWBAUGH.

Adjourned until Feb. 23, 1882, at ten, A. M.

Feb. 22, 1882, at 7:30, P. M.

Examination resumed pursuant to adjournment, by consent.

Present, Mr. Storrow for Complainants and Mr. Hill for Respondents.

WASHINGTON SUTTON *being produced, affirmed and examined, saith:*

Examined by Mr. Hill.

My age is sixty-one. Residence Lewisberry, York county, Pennsylvania. Occupation, blacksmith by trade, but I am not doing anything now. I know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pennsylvania. I never seen the man to know him till 1873. I went there to his place in 1873.

Q. 1. Were you ever at his shop at Eberly's Mills before or since that visit?

A. I was not.

Q. 2. What time in 1873 was it when you were there at his shop?

A. I can't get at the time, but some time in August. That is the nearest I can get at it.

Q. 3. How do you fix the year as 1873.

A. I had a sale—I know it to be the exact time for I have a note in my pocket that was given at my sale, and I moved to York the fifth day of April; and it was that same summer.

Q. 4. Please hand the note to the examiner that he may make a record of it?

(*Witness hands note to the examiner; copy of the note is as follows:*

"$7.00. LEWISBERRY, YORK COUNTY, PA., *March* 24, 1873.

Twelve months after date, we, or either of us, promise to pay Washington Sutton or order, the sum of seven dollars, without defalcation, for value received, hereby waiving our right to all laws exempting property from levy and sale.

(Signed) HENRY T. WISE.
D. N. BAYLER.")

A. The body of the note is in the handwriting of Thomas Groome, of Carlisle.

Q. 5. Was that note given for things that you sold at your sale?

A. Yes, sir.

Q. 6. Has the note been paid?

A. No, sir.

Q. 7. What did you go to Mr. Drawbaugh's shop for on that occasion?

A. To buy a turning lathe that he had.

Q. 8. Did you buy the lathe. If not, why not?

A. I didn't buy it. He told me that he had sold the lathe, or bargained to sell it to a man at Mechanicsburg, named Hauck.

Q. 9. While you were at Mr. Drawbaugh's shop on that occasion, did you have any conversation with him about talking machines, or see any talking machines?

A. Yes, sir; and I saw talking machines.

Q. 10. Did you talk through the talking machines at that time, or hear anybody talk through them?

A. I didn't talk through them, but he did, and told me what he could do and all with it; that he could do and all with it, that he could talk to his house, and they could tell him to come to dinner, and he could understand it.

Q. 11. When he talked through the machine for you, could you hear and understand what he said through it?

A. That is something that I can't exactly answer. I think that I told my folks when I came home that I did. But for me to say now, that I did I could not say. I don't remember. He had so many things that he was showing me there that I could not recollect. I think I told it to my nephew that I had seen a curiosity, and it was too.

Q. 12. Do you remember whether the machine impressed you at the time as being a very excellent invention or not?

[*Objected to.*]

A. I remember it did.

Q. 13. Do you remember whether you and Mr. Drawbaugh were in the same room when he was talking to you through the machine or not?

A. We were not. I cannot tell whether the machine was up stairs or not. But when we talked through it we were on different floors. That I recollect about very particular.

Q. 14. Did Mr. Drawbaugh at any time say anything to you about his financial condition. If so, what?

[*Objected to as hearsay.*]

A. I asked him why he didn't get it patented, and he said he wasn't able. That was about the way I understood him—that he wasn't able to get it done; nothing else that I recollect of.

Q. 15. What did you understand at the time by his saying that he was not able? That he had not sufficient money to do it?

[*Objected to.*]

A. Of course. That is the way I understood it, from the way he spoke.

Q. 16. Please look at the machines "B," "F," "C," and "I," and "B reproduced," and "C reproduced," and say if you can identify any of them as machines which you saw at Mr. Drawbaugh's shop at the time of that visit?

A. I seen this here [*indicating* "*C reproduced*"]. That there [*indicating* "*C*"] looks like it. I recollect particularly the permanent magnet, and that [*pointing to the brass on the top of the electro-magnet*], and that [*pointing to the mouth-piece of* "*C reproduced*"]. I might have seen all them things [*pointing to the various machines on the table*], but I can't recollect anything but this one and something that looked like that [*pointing to the electro-magnet on* "*B*"]. If you went in his shop and seen everything he had, you wouldn't wonder that I don't remember. This here [*taking up* "*reproduced B*"] is like something I seen there. I did expect to see the battery here, but that ain't there. It was a glass battery, with fixtures.

Q. 17. Was the talking-machine connected to the battery or not?

A. Yes, it was. There was a wire that connected it.

Q. 18. Do you remember how many wires?

A. No, sir; I do not.

Q. 19. When Mr. Drawbaugh talked to you through the machine, did you listen at a machine like this [*indicating* " *C reproduced* "]?

A. I can't tell exactly. I can't recollect whether I heard anything through it, but if I did, it was a machine like this here [*indicating the mouth-piece of* " *C*"]. I can't tell. That has slipped my memory, but I know I had to go upstairs and down when he talked through the machine.

Q. 20. Do you remember whether the wires were drawn tight or were hanging loose?

A. I think they were hanging loose. I couldn't be certain about that.

Q. 21. Did Mr. Drawbaugh tell you at the time that the machine was worked by electricity or not?

A. Yes, sir; he did.

Q. 22. Where did you live at the time of your sale, and before you moved to York?

A. I lived in Lewisberry before I moved to York.

Q. 23. Then you moved from Lewisberry to the town of York in April, 1873?

A. Yes, sir.

Q. 24. Where did you first see one of these telephones that are used in the cities?

A. At Baltimore.

Q. 25. When?

A. A little over two years ago, but I heard of them before that.

Q. 26. What remark did you make when you first saw or heard of them?

A. I said that if it ever was patented, Dan. Drawbaugh had a right to have the advantage of it, for I had seen it there several years before that—in 1873, when I was there.

Cross-examined by Mr. Storrow:

Cross-Q. 27. Where did you live now?

A. At Lewisberry, the place I lived before I moved to York.

Cross-Q. 28. Where did you live in York?

A. Chestnut street. I can't tell you the number, but it was right close to the jail.

Cross-Q. 29. Which way from the jail?

A. About a hundred yards south-west.

Cross-Q. 30. How long did you live at York?

A. Two years and two months to the day.

Cross-Q. 31. What was your business there?

A. I worked in a machine shop, and the rolling mill, and blacksmithing.

Cross-Q. 32. What machine shop?

A. The Northern Central Railroad shop.

Cross-Q. 33. What rolling mill?

A. I think they call it the York Steel Rolling Mill.

Cross-Q. 34. What was your business at Lewisberry?

A. I worked all the time I lived there at blacksmithing, and tried to keep store a few years. I am in no business now.

Cross-Q. 35. When did you keep store?

A. I kept store there before I moved to York.

Cross-Q. 36. How long since did you give up blacksmithing?

A. I haven't given it up altogether yet. I work at it at odd times, but not so as to amount to anything. Not since I moved from York.

Cross-Q. 37. Who did you see at Drawbaugh's shop at the time you say you went there?

A. Daniel Drawbaugh.

Cross-Q. 38. Who else?

A. I seen no one else there but myself and him.

Cross-Q. 39. How long did you stay there?

A. I was there about two hours and a half, I guess.

Re-direct by Mr. Hill.

Cross-Q. 40. Whose horse and carriage did you have when you went there?

A. I had my nephew's horse and sulky.

Cross-Q. 41. Your nephew is here at present, is he not?

A. Yes, sir. His name is R. B. Sutton.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 23d day of February, 1882.

FRED. M. OTT,
Examiner.

WASHINGTON SUTTON.

RANKIN B. SUTTON, *being produced, affirmed and examined, saith:*

Examined by Mr. Hill.

My age is 41; residence Lewisberry, York county, Pennsylvania; occupation, carrying on the earthenware manufacture. I have never seen Daniel Drawbaugh to know him but twice or three times, I think.

Q. 1. You have been present while your uncle, Mr. Washington Sutton was giving his deposition here this evening, were you not?

A. Yes, sir.

Q. 2. Do you remember the year in which he moved from Lewisberry to York?

A. Yes, sir.

Q. 3. What year was it according to your recollection?

A. 1873.

Q. 4. Do you remember the circumstance of his visiting Mr. Drawbaugh's shop?

A. Yes, sir.

Q. 5. What time was it, to the best of your recollection?

A. As near as I can tell it was in August. I may probably vary a month—it was in 1873.

Q. 6. He borrowed your horse and wagon to go there, did he not?

A. Horse and sulky. Yes, sir.

Q. 7. When he brought the horse and sulky back, do you remember whether he said anything about what he had seen at Mr. Drawbaugh's shop during his visit?

A. Yes, sir. I can.

Q. 8. Did he mention anything about seeing a talking machine there?

A. Yes, sir. He did.

Q. 9. What did he say about it?

A. He said that Drawbaugh had invented a machine that was a curiosity—something that he had never before seen. He said that he had a machine invented, or partly invented, that he could talk by electricity—by attaching a wire to electricity; that he could understand what he said, or he could talk so that they could understand him—he could talk so that his family could understand him at the house while he was at the shop, himself.

Q. 10. Did he say whether he had heard Mr. Drawbaugh speak through the machine while he was there on his visit to the shop?

A. Yes, sir. He did.

Cross-examined by Mr. Storrow.

Cross-Q. 11. When did you first know Mr. Drawbaugh?

A. The first that I ever did know him,—and that was only by hearsay,—was about a year ago. I know I saw him then, but I was first introduced to him to-day.

Cross-Q. 12. Where did you see him then?

A. I saw him at Lewisberry.

Cross-Q. 13. Whereabouts at Lewisberry?

A. I saw him at Lyman Shettel's house—talking to Lyman Shettel.

Cross-Q. 14. Where were you at the time?

A. Opposite, across the street, at John Grove's store, it is now; it was R. M. Wright's store at the time I saw him.

Cross-Q. 15. What else did your uncle tell you that he had seen or heard at Drawbaugh's shop?

A. He had talked concerning a large clock that he had invented, that run, if I mistake not, by electricity.

Cross-Q. 16. What did he tell you about the clock?

A. I do not remember a great deal more than he claimed that it was very fine work.

Cross-Q. 17. How big did he tell you the clock was?

A. I don't remember that he told any size of the clock.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 22d day of February, A. D. 1882.
FRED. M. OTT,
Examiner.

RANKIN B. SUTTON.

By consent, adjourned to meet in Philadelphia, at the Continental Hotel, on Wednesday, March 1st, 1882, at ten o'clock, A. M.

March 1st, 1882, *ten o'clock*, A. M.

Examination resumed pursuant to adjournment.

Present, Mr. Storrow for complainants, and Mr. Hill and Mr. Jacobs for respondents.

W. H. DECKER, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

My age is forty-one years; my residence is 1118 Poplar street, Wilmington, Delaware; occupation, iron-worker; I am called a roller, and am employed in the Combination Iron and Steel Works of Roach, Weed & Co., at South Chester. I know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Penna., and have known him since 1873.

Q. 1. Are you the foreman of the works, or any part of it, where you are working?

A. Yes, sir; I have charge of one train of rolls—called the twelve-inch train of rolls.

Q. 2. How long have you lived at Wilmington?

A. Going on three years.

Q. 3. Where did you reside prior to going to Wilmington?

A. At West Fairview, Cumberland county, Pennsylvania.

Q. 4. For whom did you work at West Fairview, and how long?

A. For Col. Henry McCormick. I went in February, 1872, and worked up till December, 1877.

Q. 5. In what mills?

A. In the first place I was hired by my uncle to go there to start the double turn on the nail-plate-mill; to roll the nail-plate for the nailers. That was in February, 1872. That was the first time the double turn was ever started there. They had always run single turn before.

Q. 6. Were you ever at the shop of Daniel Drawbaugh, at Eberly's Mills. If so, when first?

A. In August, 1873.

Q. 7. How do you fix the time?

A. In May the double turn didn't run so very well for the first start off. I goes to Lancaster to start a new mill—a bar-mill, to roll bar-iron. I worked up to July 17th, when, there being a reduction of seven *per cent.*, I concluded I wouldn't work. I could do better at home, as the double turn was going to run again. The double turn didn't start right away, and I knocked around home. My friend, Mr. Hiram Dunbar, frequented the mill every day, as the double turn was supposed to be starting pretty soon—he running eight self-feeding nail-machines. He got talking about the self-feeders. He says: "You ought to go down and see Drawbaugh's self-feeder, that he had there some time ago." I says, "Where is this Drawbaugh?" He said, "Down at Eberly's Mills," giving me the directions how to go. I told him I would go down there some day, so I went down there about the middle of August, as near as I can judge. That was the first time I had known Drawbaugh.

Q. 8. How long were you at his shop at that visit?

A. To the best of my knowledge, about any hour. About twenty-five minutes of that, I think, I spent down the cellar examining the nail-machine. Understand that nail-machine was on blocks at the time. It wasn't running at the time, but was so situated that he could put the power to it and run it any time. I didn't see it running.

Q. 9. What was you doing the rest of the time, while not examining the nail plate-feeder?

A. I came upstairs to the second story. I walked into the second room—there is an ante-room as you came upstairs. I says, "I saw your nail-machine." He said, "What do you think of it?" I told him I didn't know what to think of it till I seen it run. That question dropped there. Then I says to him, "I see you are buisily engaged here." He says, "Yes, I am always making something. He turned around to his work then. He was busy at the bench doing some work.

Q. 10. Did you, or not, at that time, see any talking-machines at his shop?

A I saw the oyster can,—or a tin cup that I called an oyster can,—on a piece of board, and the glass tumbler filled with something white.

Q. 11. Did you have any talk with him about the talking machines at that time?

A. Looking around some little time, I put my hand on this tin can. I says, "What do you call this?" "Oh," he says, "we are going to talk through that some of these days."

Q. 12. Did he at that time make any explanation to you about the machine—how it operated, or not?

A. He went on to explain about the electricity, but of course I didn't understand it. I wasn't posted on that branch of it—on that art.

Q. 13. Were you at Daniel Drawbaugh's shop afterwards? If so, when was your next visit?

A. In 1874.

Q. 14. What time in 1874, and how happened you to go there at that time?

A. I think it was at the commencement of the fall, if my memory serves me right. Mr. Kline being a blacksmith in our town when I first came there—I don't know his first name—was around my father-in-law's hotel. He had a patent spindle for a sewing machine. This was Mr. Kline's own patent. It is to take up the lost motion of the driving-wheel—the wheel where the belt goes round. He said he had got a lot made in Allentown, and they were going to have them finished up at Milltown. My father was living with me at the time. Understand, Mr.

Kline lived over at Camp Hill at that time, or over in that neighborhood some place. I got talking to my father about this spindle of Mr. Kline's. My father says, "You had better go over and see him some day." I told my father I though there was some money in this spindle, and I would go over and see whether I couldn't buy some territory. I thought Allegheny county would be a good territory for him to buy. I went over and seen him. I saw the spindle, and had a talk with Mr. Kline about it. He said he couldn't say much about it—they were going to put in machinery there to manufacture spindles themselves, some of these days.

Q. 15. Were you talking of buying territory for yourself or for your father?

A. For my father. He lived in Hollidaysburg, Blair county, at the time. He was stopping with me. It would be handier for him to go to Pittsburgh, as he lived a little over a hundred miles from there. That was the reason I thought Allegheny county, which includes Pittsburgh, would be a good territory for him to have. As he was an elderly man, I thought it my duty to try to get him something to do so that he would not have to work so hard as he did when he was a rolling-mill man.

Q. 16. Where did you see Mr. Kline on that visit?

A. At Mr. Drawbaugh's shop, at Eberly's mills, outside, at the foot of the steps.

Q. 17. Did you see Mr. Drawbaugh at that visit?

A. Mr. Kline said I must excuse him, as he had to go up to the Soldiers' Orphans' School to see his son-in-law, Captain Moore, and that he would see me at some other time. Mr. Kline left me, and I walked upstairs, and walked right through into the shop, where Mr. Drawbaugh was. I says, "I see you are busy all the time." He says, "Yes, I must work." Then he went on—he had something in a vise—filing there. I looked around a few minutes, and seen several things laying around on the benches. I picked up one of them, and was looking at it. He says to me, "I guess you don't know what that is?" I says, "No, sir." He says, "That is some more of my talking machines." —I still had it in my hand, turning it over and looking at it. He turned and went towards the other end of the building—pretty near the other end. I still had it in my hands, and put it up to my mouth—thought I could talk, or do something of that kind. He says, "Put it to your ear." I put it to my ear, and the sound came. "What is your name?" he says. "W. H. Decker," I says. Another sound came, "Where from?" "West Fairview," I says; another sound came—says, "Do you know Jake May?" I says, "Yes, sir." He took the part that he had somewhere over there and said, "What do you think of that?" I said, "I think that is a queer kind of a thing." He said, "That is the way we are going to talk to the people some of these days." I said, "I don't see how you are going to do that." Then he went on to explain about the electricity and the magnet, and while I had it in my hand—the circle there—I said, "Well, is this where the vibration came from? is this where the sound came from?" "Oh," he said, "that will be all right some of these days."

Q. 18. You spoke of hearing the sound come "What is your name?" "Where from?" and "Do you know Jake May?" How did you hear those sounds, through the instrument, or through the air, directly from him.

A. Through the instrument. I had it up to my ear. I couldn't hear from him directly through the air, as he was too far from me,—at the opposite end of the building,—and he talked low.

Q. 19. When you answered back to him, did you answer through the instrument or through the air?

A. Through the air.

Q. 20. Was the instrument that you held to your ear connected in any way to the instrument that he had? If so, how?

A. There were several wires running along the wall, and there were wires on the one that I had—small wires.

Q. 21. Were those wires connected to the instrument when you first took it up, or did he make the connection afterwards?

A. The wires were connected to it when I first picked it up.

Q. 22. Did you ever visit his shop afterwards. If so, when did you next visit it, after the fall of 1874?

A. In 1875.

Q. 23. Can you state at what time in 1875?

A. About the latter part of August.

Q. 24. How came you to make that visit, about the latter part of August, 1875?

A. My father went home about the holidays—I mean Christmas of 1874—during that year he read a great deal of chemical books, while he was doing nothing. He came to me in March again, and said he thought they had discovered a water-proof grease. In May I gave him part of the stable, and gave him money to buy the materials, that he wanted to make the grease. I got Mr. Hood, the tinner in our town, to make a couple of hundred of tin boxes for me,—small boxes, of cheap tin. My father put his grease that he had made in them, and I gave it away to my friends to try, and tried it myself. My friends, that I had gave it to, to put on harness, put it on the harness, and found that it made it pliable. I gave it to Mr. Dunbar to put on his driving buggy. I gave Silas Gleim a box, to try on his driving buggy. I gave Barney Wilder a box, to try on his buggy, when he kept the Bridgeport Hotel. I asked Mr. Dunbar, in a couple of weeks, what he thought of the grease. He said he thought it was first-rate. I asked Silas Gleim, in the meantime, what he thought of the grease—and he done a good bit of driving, himself, Silas did—said he, "I think it is the very thing;" he said, "I put it on my spindle, and it winds around like very fine thread, on the spool, and stays on the spindle." Hearing a good report of it all through, and people coming to buy it, I got my father to manufacture more, and bought more boxes and labels. I took some to Marysville, to Mr. Foland—five or six dozen—and left them on commission with him. I took some to Duncannan, some to Harrisburg, to two or three stores. I sent some to Northumberland; and in August I went over there to Camp Hill. I took some over to White Hall. I talked to Captain Moore, and told him I was going down to see his father-in-law, who was then down at the mill. I went there and saw Kline and gave him a box down there, and told him I thought it would be the very thing for his spindle; to try it on. I was in the shop and talked to Dan. Drawbaugh. I says, "How are you getting on with your talking-machine?" "Oh well," he says, "If we had a wire to Fairview, we could easily talk to you people up there."

Q. 25. When you were down there at Drawbaugh's shop, about the latter part of August, 1875, as you have testified, do you remember whether they were making Kline's patent axles there at the shop?

A. They were fitting them up. They had them forged somewheres, and they were fitting them up themselves there at the shop.

Q. 26. At that visit, in 1875, did you see any talking-machines there at the shop?

A. Yes, sir; plenty of them, on the bench and on the walls—at least, what they called talking-machines.

Q. 27. By "on the walls," what do you mean? Explain yourself.

A. Some were fastened up against the wall, and some were on the benches. The bench was up to my stomach, as near as I can judge. I leaned against the bench.

Q. 28. Did you, at that visit, talk through the talking-machines or not?

A. No, sir; I did not talk, but Mr. Drawbaugh talked to Mr. Kline through the talking-machine, and I stood right alongside of Mr. Kline, right against the bench.

Q. 29. Did anybody talk to you through the talking-machine at that visit?

A. Yes, sir.

Q. 30. Who talked to you through it?

A. Daniel Drawbaugh.

Q. 31. Could you hear and understand, through the machine, what he said.

A. Yes, sir.

Q. 32. Have you any recollectihn of what was said, through the machine, to you at that time?

A. Yes, sir.

Q. 33. State what you remember of it.

A. "How is my old friend, Jacob May, and his family?" he says. I said, "They were all well when I last saw them." He says, "I understand there is an increase in the family." I told him I wasn't posiive of that, and couldn't give him no positive answer. He says, "Well, they are all well, so far as you know?" I said, "Yes, sir." He said, "I am much obliged."

Q. 34. Where was he when this conversation through the machine was going on?

A. At the back part of the building, in a small off-set of the building, where he kept something.

Q. 35. By an off-set, do you mean a small room?

A. A small room; yes, sir.

Q. 36. Was he in the small room?

A. Yes, sir; right by the door.

Q. 37. Did you hear what he said through the instrument or through the air?

A. Through the instrument.

Q. 38. Did you answer back to him through the instrument or through the air?

A. I said to Mr. Kline, "Can I talk through this?" That is when

AMERICAN BELL TELE

Mr. Kline handed me the instrument. Daniel says, "Take this instrument." "Oh!" said Mr. Kline, "yes, you can talk anything you want to talk." I answered back through the instrument.

Q. 39. Were you there at the Mr. Drawbaugh's shop after that time? If so, how long after that?

A. I was there in 1877.

Q. 40. About what time in 1877 were you there?

A. I can't just fix the date. It was just about a couple of weeks after I had gone to Harrisburg to see the Hazleton clock that was exhibited there. It was in warm weather, but I can't fix the exact time.

Q. 41. Please state what you refer to by the Hazleton clock being exhibited in Harrisburg.

A. Being over in Harrisburg on Saturday afternoon, after getting done work, I saw an advertisement on Third street, near Walnut, of the "Great Wonderful Clock." I saw, "Admission, ten cents to see the great wonderful clock, the wonders of the world." I goes in and sees the clock. A young man, having it in charge, was giving an account of all its working, and how long it took to get it up—by this man in Hazleton, the inventor. On Sunday morning, after I got my breakfast, I went up into Jake May's shop, and told him what I had seen in Harrisburg. He says, "Daniel Drawbaugh has got one done and is making another one, and we will go over there some time and see it." I says, "All right; the first idle day I have, I will go with you." About two weeks, or thereabouts, after that, the rolls had to be turned. It took me about three hours in the morning to get the rolls out, and get things in proper shape. So, as I came up from work, I notified Jacob May that, as it was a nice day, we would go over there now. So we went over. We went across the farms, and not around the pike—through Dick Haldeman's place—that way. Mr. Drawbaugh had one clock done, and was making another one for a party in Harrisburg—so he told us—who was to give him three hundred dollars for it. The party had engaged it for three hundred dollars. We thought it was a very nice piece of machinery.

Q. 42. Was there anybody, besides Drawbaugh, working in the shop at the time?

A. Yes, sir. He had a young man there doing the mahogany work, finishing it, and making up the casing that belongs to clocks.

Q. 43. Did you know the name of the young man?

A. No, sir, but I think he was a relation of Drawbaugh. I can't say positively, as I had no introduction to him ?

Q. 44. Were you ever there at Mr. Drawbaugh's shop after that visit in 1877 ?

A. No, sir.

Q. 45. How confident are you that the year in which you were there last, was 1877, as you have testified ?

A. I quit Col. McCormick's employ in the month of September, 1877, and went out to Kansas with a colony in the April following.

Q. 46. Have you been employed at Fairview since ?

A. No, sir.

Q. 47. When you were at Drawbaugh's shop in 1877, as you have testified, did you see any talking machines there ?

A. Yes, sir.

Q. 48. How many, and where were they ?

A. That would be hard for me tell you, for they were so numerous. On the benches, and on the wall, some five or six feet up—stuck up.

Q. 49. Did you at that time talk through the machines, or hear anybody talk through them ?

A. No, sir.

Q. 50. You have described four visits, which you made to Mr. Drawbaugh's shop. Do you think these were all the visits that you ever made there, or not ?

A. Yes, sir.

Q. 51. During any of these visits, did Mr. Drawbaugh say any thing about patenting the talking-machine ?

A. Yes, sir. The second time I was there, he said he was a poor man like myself, and if he only had the money, he would get everything patented that he had ever made.

Q. 52. Did he mention the subject afterwards, in any of your later visits ?

A. Yes, sir. Always plead poverty; that he always had to work for a living.

Q. 53. Will you please examine the machines now here present, and state whether you can identify any of them as machines which you saw on the occasion of your first visit in the fall of 1873 ?

A. These are the ones I saw, [*indicating "B" and "F."*]

Q. 54. See if you can identify any of the machines as ones that you saw at your visit in August, 1874.

A. That visit was in the middle or latter part of August, 1874. I saw this, ("*D*")—this in particular, [*witness puts his finger on the curled magnet.*] I asked him whether this caused the vibration.

Q. 55. Look at the instruments and see whether you find the one which you put your mouth to during the second visit, when Mr. Drawbaugh told you to put your ear instead of your mouth?

A. It looked something like that, [*taking up* "*A*,"] but it didn't look quite as big as that. I can hardly pick that out.

Q. 56. Please look at the instruments, and see whether you identify any of them as instruments that you saw at the time of your third visit, in August, 1875?

A. These I seen sitting on the counter. [*indicating "C" and "C" reproduced.*]

Q. 57. Look at the instruments again, and see if you recognize any that you saw at the time of your last visit, in 1877.

A. The one with the bell on it, ("*H*;") it was fastened up against the wall, about six feet up.

Q. 58. Did you talk through the machine, or hear anybody talk through it, at the time of your first visit, in the fall of 1873?

A. No. I was there by myself, with Mr. Drawbaugh. He didn't talk through it.

Q. 59. Then you heard talking through the instruments only on two visits?

A. Only on two visits. Yes, sir.

Q. 60. Those visits were, the one about August, 1874, and the other about August, 1875?

Y. Yes, sir.

Q. 61. The conversation which occurred, in which you asked him whether this was the vibrating part, was a conversation that occurred during one of the visits when the instruments were talked through, if I understand you?

A. Yes, sir.

Q. 62. And do you think you can positively identify this instrument "D," as the one which you had in your hand when you asked him whether this was the part that made the vibrations?

A. I couldn't positively identify this [*pointing to the body of the instrument,*] but this is the part [*pointing to the curled permanent magnet,*] that I asked him whether it made the vibrations.

Q. 63. Are you certain whether that conversation about that being the part that made the vibrations, took place at the second visit, to wit, the one in August, 1874?

[*Objected to on the ground that the witness has already testified about it.*]

A. Yes, sir. It was in 1874 that I asked him about this—this circle [*putting his finger on the curled magnet of "D"*]. It didn't look quite as big as this.

Q. 64. Did you see that instrument again, when you were there with Mr. Kline, in August, 1875?

A. Yes, sir. I saw it lying on the bench with others.

Q. 65. At all the visits, when you were there, were the instruments lying open, exposed to the view of any person who might come into the shop?

A. Yes, sir. Anybody could see them.

Q. 66. How many talking machines, or instruments, do you think you saw there at the time of your second visit. I mean the visit of 1874?

A. They were numerous there. I couldn't exactly give the number. Some were finished and some half finished. They were setting around there on benches and on shelves. I suppose, if they were all talking machines, there were a good many.

Q. 67. Do you know whether they were all talking machines, that you have referred to as sitting around on the shelves?

A. No, sir. I don't know whether they were all talking machines.

Q. 68. My question referred only to talking machines. I asked how many talking machines you thought you saw around there, at the time of your second visit?

A. I think there were six or seven, anyhow, to the best of my knowledge.

Q. 69. Do you think you saw as many as that, at the time of your third visit?

A. Oh, yes, sir.

Q. 70 Do you think you saw more at the time of your third visit, than you did at the time of your second visit?

A. Yes, sir. Every time I went there, there was more there than there was before.

Q. 71. Do any of these instruments here present, look like the one you had in your hand at the time when Mr. Kline was there, when you asked whether you could talk back through the instruments?

A. There are so many of them here that it would be hard to pick them out.

Q. 72. I asked you whether any of them looked like the one. Not to identify them positively.

A. Yes, sir. Several of them look like it—something like that, [*taking up* "*E.*"]

Q. 73. At the time of your first visit, did you see any talking machines, except the glass tumbler and the tin box?

A, None that I thought were talking machines. I saw models, but I didn't ask what they were.

Q. 74. At the time of your third conversation, when Mr. Kline was there with you, what explanation, if any, did Mr. Drawbaugh give you as to the operation of the talking machine—how it worked—whether by electricity, or otherwise?

A. He didn't give me none then.

Q. 75. Do you remember whether you asked him any questions about the construction, or principle of the machine, then?

A. No, sir. I didn't ask him no questions. I was talking to Mr. Kline.

Q. 76. Do you remember whether anything was said at that third visit about what caused the vibrations?

A. No, sir; nothing said to me, then, about the vibrations. Mr. Kline was talking to me, telling its value.

Cross-examination waived by Mr. Storrow.

Examination taken, reduced to writing, and by the witnes affirmed to, and for him subscribed to by me, he having been disabled by a wound received during the Rebellion, in the service of the United States.

Fred. M. Ott,
Examiner.

W. H. $\underset{\text{mark}}{\overset{\text{his}}{\times}}$ Decker.

March 1, 1882.

Recess for dinner until 4, P. M.

March 1, 1882, 4, P. M.

Examination resumed pursuant to adjournment.

Present same counsel.

ABRAHAM FISHER, *being recalled, saith:*

Examined by Mr. Hill:

Q. 1. You testified, in your former deposition, that you got a hydraulic ram from Mr. Drawbaugh in the latter part of May, 1874, which date you verified by looking at some books or memoranda made at the time. I refer to your testimony printed on page 718 [689] of Defendants' printed record. Subsequently to your testifying, as above stated, Mr. Daniel Drawbaugh was examined as a witness, and testified (on page — of Defendants's printed record) that, according to his memoranda, your purchase of said ram was in June, 1873. Please state whether your attention has been called to the discrepancy between your date and Mr. Drawbaugh's, and whether you have made further investigation to fix the correct date, and with what result?

A. I have. I received a letter from Mr. Storrow here, in regard to my evidence, that, in my testimony in the Drawbaugh case, I had stated that I had bought a ram of Mr. Drawbaugh in 1874, which I had verified by a bill, or books, I don't know which. I think that implies about what he wrote, as near as I can recollect. I replied to him without investigating, saying that I had no bill of the ram. I then went to Petersburg in the evening. I met Mr. Snyder there, who helped to put in the pipes of the ram. I asked him if he knew the date of the year, and the month, it was put in. He studied awhile, and I says, "I had the Jacobs family with me, which I was governed by." "Yes," he says, "That is right. Jacobs helped to dig the ditch." Then I said, "That was in 1874. I have it in my book." He just says then, "Well, you must be right, but when I go home I will look at my memorandum books and see if I can find anything." Then I received a second letter from Mr. Storrow, containing a copy of that part of my testimony, and asking for a copy of the memorandum that I referred to in that part of my testimony. I stated to him that I had spoke to Mr. Snyder and Ziegler, and three or fuor around me, and when I referred to the Jacobs family, they allowed that I must be right. That is what I wrote, as near as I can recollect. That is about as far as I went, that time. Then they got to talking over these things, and going back on their rents. They said they were wrong for all. Snyder said he knew, from the fact that he quarried stone for a mill-dam for Abraham Smith, in 1874, and he knows the ram was put in the year before. And his brother also said that he knew it was in 1873 that the ram was put in. William Snyder also said that he knew the fact from the different places that he had rented from year to year, which his brother would verify. This bothered me a good deal then, and my wife says to me, "What are you hunting for?" I was hunting up the memorandums of the help that was about the house. I kept no accounts, except when they would get something ahead, or in advance. "Why," she says, "you needn't be bothered about that. You know the Jacobs family was here two years. Don't you remember the times that they had at the wash-house about the rams?" This brought it all to my mind. It was a wettish season, and at every shower the ram throwed sediment up into the vessels. I took it out then, and I made Jacobs and my help carry the wash-water in a large vessel that I had in the wash-house, from the spring, if the creek was muddy, or from the pump, sometimes. I had several wash-women and ironing-women, I don't know how many, and these women nick-named this help by calling them "rams," you know, and it got to be a by-word among the help, and at last they got mad about it. I remember the circumstance very well. When I testified before, I went by the memorandum in this book [*producing an account book.*] I forgot at the time that I had the Jacobs family with me more than one year, and was misled by the entry showing charges against them in 1874.

[*The entry referred to by the witness is contained in an account book produced by him, and is as follows:*

"YORK SULPHUR SPRINGS, May 1st, 1874.

June 22,	Mrs. Adaline Jacobs,	Dr. to cash,	2.50
27,	Mrs. Adaline Jacobs,	to 1 pt. wine,	.50
27,	Mrs. Adaline Jacobs,	Dr. to cash,	.25
July 1st,	" "	" By cash for Day,	3.00
			6.25"

[*Written across the face of the above entry is the word "down," which witness says refers to the fact that these items were posted in a little passbook, and that he kept separate accounts with each servant in such passbooks.*]

Q. 2. Does your book contain any charges against the Jacobs family in 1873?

A. No, sir.

Q. 3. Why not?

A. Because I paid them off every Saturday night, and gave them none in advance.

Q. 4. Then you only charged on the books the advances you made to them, I suppose. Is that the idea?

A. Yes, sir; that is the idea.

Q. 5. Now, with your memory refreshed, as you have stated, in what year do you think it was that you got the ram from Mr. Drawbaugh?

A. In the year 1873, because I knew that Jacobs and his daughter, and his wife also, was with me that season. That is what throwed me wrong in not thinking that I had them two seasons; and I recollect, also, that I didn't have Jacobs himself regularly in 1874. I had him sometimes, but not all season. I find charges against the women, but none against him that year. This ram business has brought everything to me clearly, and I recollect it now very well.

Cross-examination waived by Mr. Storrow.

Examination taken, reduced to writing, and by the witness subscribed to before me this first day of March, 1882, he having been affirmed when previously called as a witness.

FRED. M. OTT,
Examiner.

ABRAHAM FISHER.

Adjourned until March 2d, 1882, at twelve, M.

March 2, 1882, 12 o'clock, M.

Examination resumed pursuant to adjournment.

Present same counsel.

THOMAS DRAPER, *being produced, affirmed, and examined, saith:*

Examined by Mr. Hill:

My age is sixty-six; residence, Dover, Delaware; occupation, manufacturer of phosphate, and dealer in grain, lime, and wood. I have a general transportation agency. I have a line of vessels running from Philadelphia to Dover. I know Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Penna. I have no particular acquaintance with him. I have known him since some time in the spring or summer of 1874.

Q. 1. State how you came to make his acquaintance in the spring or summer of 1874.

A. I was induced to go there with a tenant of mine, who lived on a farm of mine in Pennsylvania, to see Mr. Drawbaugh about putting in a ram to throw water from a spring we had up to a new stone house that I had built on the hill.

Q. 2. What was the name of that tenant?

A. George Kissinger, or George W. Kissinger. He was an acquaintance of Drawbaugh's, and introduced me to him.

Q. 3. How do you fix the time as in the year 1874?

A. Mr. Kissinger moved on to my farm the first of April, 1874, under a lease of that date.

Q. 4. Have you that lease here present?

A. I have.

Q. 5. Please produce it, in order that the examiner may certify the date of it upon the record.

A. Here it is.

[*The lease produced bears the date of the first day of April,* 1874, *and is signed by Thomas Draper and Geo. Kissinger.*]

Q. 6. How long after that lease was made do you think it was before you made the acquaintance of Mr. Drawbaugh, in the manner you have stated?

A. I couldn't say positively, but I think it must have been in the early part of the summer, or it may have been in May, possibly. I couldn't state positively. I know it was shortly after Mr. Kissinger moved on the place. He complained that his wife had to carry water too far, and he wanted me to put in a ram.

[*A copy of said lease, certified by the examiner, is put in evidence, and hereto appended, and is marked "Exhibit Draper-Kissinger Lease."*]

Q. 7. Are you confident that it was in the same spring or summer?

A. Yes, sir. I am sure of that.

Q. 8. Did you arrange with Mr. Drawbaugh to furnish a ram for your farm?

A. Yes, sir.

Q. 9. Do you know when that ram was put on to the farm?

A. I do not, but I don't think it was put on until 1875. The arrangement was made that Kissinger was to cut down sapling and bore out the piping until he had enough to reach from the spring to the house. He had a trouble in getting an augur to bore the piping, but at last succeeded in getting one, and made the piping. Then the ram was put in by Drawbaugh, but I was not present when it was put in, and do not know exactly when it was done.

Q. 10. When you made Mr. Drawbaugh's acquaintance did you visit his shop with Mr. Kissinger?

A. I did.

Q. 11. Were you ever there at any other time before or since that visit?

A. No, sir.

Q. 12. While you were there on that visit to Drawbaugh's shop, did you obtain any knowledge of his talking machines. If so, how did it come about?

A. Yes. Mr. Kissinger asked Mr. Drawbaugh how he was getting along with his talking machines. Mr. Drawbaugh replied that he had it nearly completed, or something of that kind. I don't exactly remember the expression, and that he was getting along pretty well. He said what he lacked was money, or means. I don't recollect precisely the expression, but what he said was that he lacked money or means to put it through.

Q. 13. Did he say anything about patenting it. If so, what?

A. I think he did. He said he lacked money to get a patent. He intended to get it patented, but hadn't the money, and Kissinger said; "You had better get Draper enlisted in it; he has plenty of money." If those were not the precise words, it was something to that effect. I think they are the precise words.

Q. 14. Did, or did not, Mr. Drawbaugh then signify his desire to have you take an interest with him, and furnish the money?

A. I don't recollect the precise words that he said, but he invited us into the shop or place where he had his talking machines, and intimated that he would like me to take an interest in it. I don't remember the precise expression, but he took the pains to show me his instruments, and gave me to understand that he wanted me to go in with him. I declined; I told him that I was too far away, as I was in business in Delaware, and I did not care to invest in it, although I thought it was a good thing and might turn out well.

Q. 15. Do you remember whether he said anything about what he thought the value of it, and if so, what he said?

A. He said he thought it was, or would be, one of the greatest inventions of the age, and would take the place of telegraphing. I think those were as near his words as I can recollect—about the expression.

Q. 16. Did he state whether he had used the talking machine outside of his shop, or not?

[*Objected to as secondary and hearsay, and otherwise unimportant.*]

A. I think he said he had not used it out. He said he was convinced he could.

Q. 17. Do you remember whether he gave any reason for not having used it outside of his shop, and if so, what that reason was?

[*Same objection.*]

A. I don't recollect his words on that occasion. He intimated that he was keeping it kind of secret, but I don't recollect his words. I know what he said he could do, but I don't know what his reasons were for it, only as I gather it from his talk.

Q. 18. What did you gather from his talk, that his reasons were for keeping it kind of secret?

[*Same objection.*]

A. I thought from what he said that he didn't want anybody to know. He said he thought that by the same current of air he could talk across the street. I don't think he told me what his reasons for keeping secret were. The idea that I gathered was that he intended to get a patent on it, and was keeping it secret for that purpose. I don't know that he said so to me, but that was the idea I got of it.

Q. 19. When he took you in to show you his talking machines, did he talk to you through them or not?

A. He did.

Q. 20. When he was talking, and you listening through the machines, were you in different rooms, or was he in the same room with you?

A. We were in different rooms—adjoining rooms.

Q. 21. Were you so situated that you could hear what he said, except through the machine or not?

A. I could not have heard. There was a door between the two rooms, but he closed the door. He and Kissinger were in one room, and I went into the other.

Q. 22. Did you actually hear and understand through the machine what he was saying in the other room?

A. I did, though his voice seemed to be very much changed—a fairy voice—kind of a feminine voice—something like a whisper. I could understand distinctly every word that he said, but I could not have told that it was the same person talking.

Q. 23. Have you ever, since that time, listened at one of these electric telephones that are used now in towns and cities, and heard the words that came over the telephone line?

A. I have, but never but twice that I recollect of.

Q. 24. When and where was that?

A. In the city of Philadelphia here. Once in Holmes & Brazer's office, and once in Baugh & Son's office. It has been within a year or two. I think, perhaps, it was within the last season. I think Mr. Barnet, in Baugh's office, asked me if I had ever heard a telephone, and invited me in to listen. I told him I supposed I had heard one before ever he did, and I told him about Drawbaugh's invention. I supposed it was the same thing. I supposed Drawbaugh had got somebody in with him, and I never knowed any better until this man came down to Dover. I never inquired anything about it.

Q. 25. When you listened at the telephone here in Philadelphia, how did the voice which you heard through the instrument compare with the voice you heard through Mr. Drawbaugh's instrument, at your visit to his shop, and which you described as having a fairy-character or sound in it?

A. It appeared to me to be precisely the same. I thought it was the same thing.

Q. 26. Will you please examine the talking-machine instruments here present, and see if you can identify any of them as the instruments which you saw at Mr. Drawbaugh's shop?

A. I recollect this thing here [*indicating* "*C reproduced*"]. These two are pretty much alike [*pointing to* "*C*" *and* "*C reproduced*"], and I couldn't tell which one it was, but I recollect this very distinctly [*pointing to the permanent magnet on* "*C reproduced*"]. It seemes to me that it was something like that [*indicating* "*I*"] that I had in the room where I was when I listened [*witness takes up* "*I*" *and puts it to his ear*]. I held it up to my ear this way when I listened. I think that is the very box. I couldn't say positively, but it was one like that. He talked to me more freely about that permanent magnet [*indicating* "*C reproduced*"], and explained to me about the positive and negative poles of it, and how to charge it. He charged my knife with it. He drew it over the knife in one way and charged it, and then he drew it over the other way and took the magnetism off. He put it on and took it off several times, and then I told him to leave it on, that I wanted to take it home that way. I don't know that I recollect any of the other instruments. He had so many instruments and things lying around there on the bench that I can't recollect, but I am pretty positive that these two [*indicating* "*C reproduced*" *and* "*I*"] are the very ones, or just like the ones. I recollect that he had a glass tumbler somewhere about the machinery, lined with something white—plaster-of-paris, or something of that kind. I don't know what position he had it in, nor how he marked it; neither do I know how he marked the other instruments. I done the listening and he done the talking. I only know that that is the thing [*indicating* "*I*"] that I listened at, or something like that.

Q. 27. When he talked through the machine in the other room, was it the machine like this [" *C reproduced*,"] that he used ?

A. I couldn't see it when I was in the other room, but when I came back he showed it to me, and told me that was what he used. I think there was a wire connected to it in some way. I think the wire ran through a hole in the wall.

Q. 28. Did you understand at the time that the machine worked by means of electricity, or not ?

A. Yes, sir. He tried to explain that thing to me.

Q. 29. When he magnetized and de-magnetized your knife, did he use the magnet that was on the talking machine for the purpose ?

A. He did.

Q. 30. Did he take the magnet off of the talking machine to magnetize your knife ?

A. He did. He took the thing to pieces when we left. He only took the magnet off and hung it up on a peg over his bench.

Q. 31. You mean by his taking it to pieces that he took the magnet off and hung it up ?

A. Yes, sir.

Q. 32. When you were first taken into the shop to see the talking machines, where were the talking machines ?

A. I think the magnet was on the same pin that he hung it on when we came away. I think the other machines were in their places on the bench. I inferred from his whole demeanor there, that he was anxious to get me to take hold of it with him. That is what I inferred.

Q. 33. In your 24th answer you say, in substance, that when you heard the speaking telephone here in Philadelphia, you supposed that it was the same thing which you had seen at Drawbaugh's shop, and supposed that Drawbaugh had got somebody in with him, and never knew any better "until this man came down to Dover." Until what man came to Dover? Please explain what circumstance you refer to?

A. I don't remember his name. He said he was a lawyer employed by the Bell Telephone Company. I think he said he was from Boston, but I may be mistaken in that. I don't know whether he said he was from Boston or New York, but I most think he said he was from Boston.

Q. 34. About how long ago did he call upon you at Dover?

A. I think it was in the latter part of January, 1882, or the beginning of February.

Q. 35. Did he tell you that he came to see you about anything. If so, what?

A. He said he wanted a few minutes private conversation with me. There were one or two persons in my office, and they stepped into the other room. He then desired to know what I knew about invention of the telephone. I asked him what he wanted—what he meant by it? and then he told me that there was a law-suit pending, but didn't tell me who, or why, or anything about it, except that he wanted to know what I knew about the invention. I refused to tell him for some time. I told him I didn't want to be called away as a witness anywhere. I asked him, then, how he found out that I knew anything about it? He told me that a man by the name of Miller had told it in Wise's store in Marysville; that he (Miller) had heard me say that I had been over to Drawbaugh's shop, and had seen his talking machine. Miller was a man who worked for me. He carried the chain for me when I laid out the borough of Marysville, and he was well acquainted with me.

Recess for dinner until 3:30, P. M.

March 2d, 1882, 3:30, P. M.

Examination resumed, pursuant to adjournment.

Present same counsel.

Examination of Thomas Draper by Mr. Hill continued:

Q. 36. What further conversation did you have with this gentleman during his call at Dover?

A. He told me that it was not likely that I would be called away anywhere. That if my evidence was of any use to them, it would be taken there at Dover, by a commission for that purpose. At that time I didn't know anything about what was going on, nor had he told me which side he was on. After he said it was not likely that I would be taken away, I told him, as near as I can recollect, just what I have told you gentlemen. That I had been over to Drawbaugh's shop and had seen the instruments. I think I told him that I didn't know whether it was in 1874 or 1873, but that I thought it was in 1873. He asked me if I was sure it was prior to 1876, that I was there. I told him I knew it was that; that I knew it wasn't later than 1875, but that I thought it was in 1873 or 1874. Then he asked me whether I had no papers, bills or memoranda of any kind from which I could fix the date; and I told him that I didn't know whether I had or not, that I might have. I told him that if I were to institute a search among my old papers, it was likely I might find something, but that I didn't know that I could. I didn't make any search while he was there. He only stayed an hour, or an hour and a half. Then he asked me about Drawbaugh's instruments—what sort of instruments he had, and I described them to him as nearly as I could. He asked me a great many questions about them. After I had answered them all as best I could, he said it was a very singular thing that two men in different parts of the country should fall upon the same, or hit upon the same kind of instruments. Then I told him I thought it was all one and the same thing. That I had always thought it was Drawbaugh's patent. That I had heard of the Bell telephone, but thought he had got Bell in. That was the idea I had of it. He went on and told me different. He then went on and told me that he was an attorney for the Bell company, and told me about the law-suit. And he told me I had missed a big fortune. He said, "You wouldn't need to be here manufacturing phosphate if you had just taken hold of that thing with Drawbaugh." That is about the conversation we had. He said I needn't be uneasy about being called away as a witness, as they would not need me. Said he, "We shall not need you." He said if the other party didn't need me, they should not. "If the other party don't call you away, we shan't, certain."

Q. 37. Do you know how the "other party" came to know about your information, and to call you as a witness?

A. I wrote to Mr. Drawbaugh and stated to him that this gentleman had been there. Told him that I had given him the information that I got, and stated that I thought, while I was doing so, that he was his attorney, and that it was his patent; that that was the impression I was under when I gave him the information. That was the way he got to hear of it. I wrote to him. I think if I am not mistaken that I wrote to him about the visit that Kissinger and I had made to his place.

Q. 38. Please look at the letter which I now hand you, and state in whose handwriting it is, and whether it is the letter you wrote to Mr. Drawbaugh, as stated in your answer above?

A. This is the letter I wrote.

Q. 39. Did you send the letter to Mr. Drawbaugh through the mail?

A. I presume I did. I sent it to him somehow. I had no other way to send it but through the mail. I see this letter is dated January 30th. I supposed it was about the latter part of January, but I had forgotten the date.

[*Mr. Hill puts the letter in evidence, to be marked* "*Exhibit Draper letter,*" *and by consent a copy is substituted for the original, the original to be produced when called for.*]

Q. 40. I see that the letter refers to the conversation between you and the attorney of the Bell Telephone Company and I find, among other things, the following in it; "I told him I did want to be called up as a witness," the first five words, ending with "did," being at the bottom of page 1, and the rest being at top of page 2. Why did you tell him that?

A. I didn't mean that I told him that. I intended to tell him that I was too old to go away from home, and did not want to be called as a witness. It was a mistake I must have made in writing, if it reads that way. I told him repeatedly, before I knew what side he was on, that I did not want to be taken away from home. I cannot ride in the cars, or even in a carriage, without suffering from it, on account of neuralgia in the spine, that I contracted in the army.

Q. 41. Please look at the envelope which I now show you, and state whether the superscription is in your handwriting, and whether that is the envelope in which you sent the letter referred to, to Mr. Drawbaugh.

A. Yes, sir; that is my handwriting. The date corresponds with the letter; that is, the envelope in which the letter was sent.

[*Mr. Hill puts said envelope in evidence, to be marked "Exhibit Draper envelope." By consent, a copy of said envelope is put in evidence, the original to be produced when called for.*]

Q. 42. After you had sent that letter to Mr. Drawbaugh, did you have a visit from him with reference to the matter?

A. Yes, sir; I didn't hear anything from him until he came down to Dover in company with Mr. Jacobs. I think it was about a week or ten days after that. I didn't take any account of the time, but I know it was some days.

Q. 43. Was that the first time you had seen Mr. Drawbaugh since your visit to his shop in 1874?

A. Yes, sir.

Q. 44. I notice that in the letter you speak of having made the visit to his shop in 1873 or 1874, and you now fix the time positively as in 1874. When did you investigate the matter, so as to fix the time correctly?

A. The next day after Mr. Drawbaugh was down to see me at Dover. I told him I would take a ride down to the farm, which was about eight miles from Dover, where I had been living most of the time since I was at his shop in 1874, and make a search among my old papers to see if I could find any dates. There I found the lease between Kissinger and myself, bearing date April 1st, 1884. That is the way I arrived positively at the date.

Q. 45. You spoke of having been in the army during the war. In what regiment were you and in what capacity did you serve?

A. I was in the 3d Regiment Delaware Volunteers—militia. I went out as captain of company H.

Cross-examined by Mr. Storrow:

Cross-Q. 46. At the time of your visit to Mr. Drawbaugh's shop, which you have described, where were the three talking machines which you have identified?

A. I think they were on a long bench that was at one end of his shop. The horse-shoe magnet, if I am not mistaken, was hanging on a pin or nail over the bench.

Cross-Q. 47. Did you see any other talking machines in the room at the time?

A. I only saw those three, after he put them together, that I have described, that he used. There was a number of other small matters lying there on the bench. He had a glass tumbler connected with the machine in some way. It was coated with a white substance, that I think he told me was plaster-of-paris.

Cross-Q. 48. Did you understand that any of these other small matters were talking machines, or that the three you have pointed out were the only ones he had?

A. They were the only ones that he mentioned to me. He said he had been working on it for several years, but whether these other little matters or models were talking machines or not, I don't know. He didn't state anything to me about it.

Cross-Q. 49. I understand you to say that the visit to Drawbaugh's shop, you have testified about, was for the purpose of ordering a ram, but that it was the following season when the ram was actually delivered and put up. Is that your meaning?

A. So far as my visit to Drawbaugh's shop is concerned, that is correct; but I am not certain that I said positively that the ram was not put in until the next season. I am not certain about that, but I am of the opinion that it was not put in until the next season. I know that there was considerable delay about getting the wooden piping bored, and I wrote to him several times about it, but Kissinger didn't get it in until sometime in the following season. I was anxious to see how the ram would work. Kissinger's excuse to me was, that he couldn't get an augur to bore the pipes with. I think it was some time late in the season. I think it was in the fall of 1875, sometime, when he put the ram in. That is my impression.

Cross-Q. 50. In your 34th answer, you say that the gentleman came to call on you at Dover, in the latter part of January, 1882, or in the beginning of February. Can you now tell which it was?

A. I could only fix the date by my letter to Mr. Drawbaugh positively. I know I wrote very soon after he was there. The letter is dated January 30th. That would fix the time in January. I kept no account of the time, and no copy of the letter that I wrote.

Cross-Q. 51. Had not some of your acquaintances talked with you about Drawbaugh's talking machines, within a month or two before that visit?

A. Not to my recollection.

Cross-Q. 52. Do you remember when you last had any talk about it with anybody, before that?

A. It seems to me that there was something said in Marysville, when I was up at Christmas, or near Christmas, in Eppler's shop. But I don't remember now what the conversation was. I think we were talking about the ram, and some one mentioned that it was out of order. And I think I asked Eppler what had become of Drawbaugh's talking machine—what he had done with it, but I don't recollect the reply, if any was made. I recollect that I told Eppler about having been at Drawbaugh's shop and having seen the talking machine. It was some time since this last Christmas that I was up there, but I don't remember the time exactly. They said that the ram was out of order, and I asked then, if he couldn't get Drawbaugh to come over and put the ram in order.

Cross-Q. 53. Do you still own the farm that the ram is on?

A. I hardly know how to answer that question. I have sold it since, but the deeds are not executed. I have traded it away with I. Engle Cochran, of Chester, Pennsylvania, for some Chester property, but the deeds have not been executed on either side.

Cross-Q. 54. When was that trade made?

A. I can't answer that date. We commenced talking about the trade some time in January of this year.

Re-direct by Mr. Hill:

Q. Q. 55. Was the ram, that was mentioned at Eppler's store, the same ram that was purchased from Drawbaugh and put on to your farm?

A. Yes, the same ram. The tenant on the farm told me that the ram was out of order, and Eppler was my agent over there, and I asked him whether Drawbaugh couldn't be got over to put it in order, and then this conversation took place, as I have stated. I had supposed that his talking machine was the same machine that was in operation. I had not made any particular inquiry about it.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 2nd day of March, 1882.
FRED. M. OTT,
Examiner.

THOMAS DRAPER.

GEORGE W. HEIGES *being produced, affirmed and examined, saith:*

Examined by Mr. Hill:

My age is forty-three; residence, Eberly's Mills, Cumberland county, Penna.; occupation, machinist.

Q. 1. Where and by whom have you been employed for the month or two last past?

A. I have been employed by Mr. E. W. Chellis, at the machine works, at Eberly's Mills.

Q. 2. By the machine works, do you mean the old shop that has been occupied a good many years by Daniel Drawbaugh?

A. Yes, sir.

Q. 3. Do you know this gentleman who sits by my side, Mr. Park Benjamin?

A. Yes, sir. I have had some little acquaintance with him, of late.

Q. 4. Were you present at said shop at Eberly's Mills within the past month, when Mr. Park Benjamin was testing some telephones there?

A. Yes, sir. I was there when Mr. Benjamin was testing the instruments—different machines.

Q. 5. Did Mr. Benjamin call upon you while he was making those tests to assist him by watching the instruments during his absence, in order to be sure that no change of instruments was made, except by himself?

A. Yes, sir.

Q. 6. How was the matter managed by Mr. Benjamin and you to guard against any change of the instruments while he was out of the shop?

A. Mr. Benjamin would fasten the instrument on the line—connect it—and I was asked by Mr. Benjamin to be present to see that nothing was disturbed at that instrument while he was away, and that it was left the same as he had put it.

Q. 7. Did you do as he requested you?

A. Yes, sir.

Q. 8. In each case, when Mr. Benjamin attached an instrument to the line and left you to watch it till he came back, in any and all of those tests, please state whether the instrument was changed while Mr. Benjamin was away from your presence, or whether the same instruments continued to remain attached until Mr. Benjamin's return?

A. The same instruments remained attached as Mr. Benjamin had put them.

Q. 9. And were Mr. Benjamin's directions to you complied with in all respects?

A. Yes, sir.

Q. 10. In some of those tests, did or did not Mr. Benjamin attach certain instruments to the line inside of the building, and directly in front of a glass window, through which he could see the instruments, while he operated at the other end of the line, outside of the shop?

A. Yes, sir; he did.

Q. 11. Then, when Mr. Benjamin affixed an instrument to the line in the shop, and went outside of the shop to the other end of the line to test it, and left you to watch the instrument in the shop, in every case the test was made with the identical instrument which he affixed to the line before he went out. Is that the fact or not?

A. It is.

Cross-examined by Mr. Storrow:

Cross-Q. 12. How long have you been employed in that shop?

A. Since the third of November, 1880, I have been employed there.

Cross-Q. 13. Where did you live before that?

A. I had my family in Franklintown, York county.

Cross-Q. 14. Where did you work then?

A. At Churchtown, Cumberland county.

Cross-Q. 15. You have described the manner in which you watched various instruments for Mr. Benjamin. What were the instruments you watched?

A. Telephone instruments.

Cross-Q. 16. Were they instruments which have been used in this case or put in evidence?

A. I can only answer that by hearsay.

Cross-Q. 17. Please answer it by hearsay.

A. Mr. Drawbaugh told me that they were the instruments that belong over here. That has been reported to me, maybe, three or four times.

Cross-Q. 18. Did they have attached to them tags, bearing the signature of Mr. Ott, the examiner?

A. Yes, sir.

Cross-Q. 19. The tag attached to each instrument had a letter on it to designate it, didn't it?

A. Yes, sir.

Cross-Q. 20. Please to tell me, by letters or otherwise, which are the instruments which you watched, as you have described?

A. "I" was one of them; "A" was one of them; "D" was one of them; "E" was one of them; "C" was one of them; "O" was one of them; "G" was one of them; "L" was one of them; "M" was one of them; "P" was one of them. That is all I have down. That is all I could say at present.

Cross-Q. 21. Did you watch any others than those you have just mentioned, and if so, which are they?

A. We tried "H" and "N." I can't remember of trying "J" or "Q." I don't remember of trying "F" or "B." We tried a reproduced tumbler instrument "F," and also a reproduced tin-can instrument "B."

Cross-Q. 22. How long have you known Mr. Chellis?

A. The first time I met Mr. Chellis was the week before I commenced to work, which was the week before the third of November, 1880. Since that I have known him.

Cross-Q. 23. How long have you known Mr. Daniel Drawbaugh?

A. I can't tell that time exactly. It is about three years.

Re-direct by Mr. Hill:

Q. Q. 24. Do you know whether the instruments "C," "P," "L," "M," and "O," which were tried in your presence, were original or reproduced instruments?

A. I wouldn't be able to tell whether the instruments named were the original or reproduced instruments, for the reason that I am not well enough acquainted with them. My attention has not been upon this work at all. I can say very little about that.

Q. Q. 25. Was your attention particularly directed to anything, except that when Mr. Benjamin attached an instrument to the line and went out of the shop, that instrument should not be detached or changed till he directed it to be done on his return?

A. I can't recollect at present of anything, just at this time, besides the attachment of the machines.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 23d day of December, A. D. 1881.
Fred. M. Ott,
Examiner.

George W. Heiges.

[*The examination of Daniel Drawbaugh was temporarily suspended in order to take the foregoing deposition, and resumed at its close, Dec.* 23, 1881. FRED. M. OTT, *Examiner.*]

Adjourned to meet at the office of Park Benjamin, Esq., No. 234 Broadway, New York city, New York, at 10:30 A. M., on Saturday, March 4, 1882.

March 4, 1882, 11 A. M.

Examination resumed, pursuant to adjournment.

Present, Mr. Storrow for Complainants, and Mr. Hill for Respondents.

PARK BENJAMIN *being produced, sworn, and examined, saith:*

Examined by Mr. Hill.

Q. 1. State your age, residence and occupation?

A. Age, thirty-three; residence, New York City; occupation, Mechanical Engineer.

Q. 2. What opportunities have you had for becoming acquainted with mechanical science, and the mechanical arts, including electricity and its practical application in the arts, and more particularly referring to the electric speaking telephone, and various discoveries, inventions and publications, having relation thereto?

A. I am a graduate of the United States Naval Academy, and have devoted myself to the study of mechanical science and engineering, as a profession, for upwards of twelve years last past. I was for six years associate editor of the *Scientific American*, between 1872 and 1878, and I am the editor of *Appleton's Encyclopedia of Applied Mechanics.* For more than three years last past I have practiced as a Mechanical Engineer, and solicitor of patents, and I have repeatedly been called to testify as an expert in patent cases in United States courts, in this and other circuits. I have been familiar with the principles of electrical science during my professional life, and, more especially, with electric telephones, from 1870. During this interval I have kept myself posted on the progress of invention in telephones, so far as the same has been made public, and I consider myself reasonably familiar with the principles on which the apparatus is based, and with its various forms.

Q. 3. When did you first hear of the term "Telephone," and in what connection?

A. As I have stated, I think in 1870. I was then editorially connected with the *Manufacturer and Builder*, a scientific magazine still published in this city. In the issue of that journal of May, 1869, appeared an illustrated article on the Reis telephone. From that article I first became acquainted with the name and the construction of the instrument described. Subsequently, and I think in 1870, I saw a Reis telephone made or obtained by Dr. Van der Weyde, who was also connected with the *Manufacturer and Builder* at the time, and from that instrument obtained a more practical knowledge of its construction and operation.

Q. 4. What were your duties in connection with the *Scientific American*, while you were editorially connected with that journal, from 1872 to 1878, as you have testified ?

A. I was an associate editor, and was the only person regularly and continuously employed to perform editorial labor in the office of that journal, assisting the proprietors. I went from the *Manufacturer and Builder* to the *Scientific American*, in July, 1872. There were, of course, outside contributors and proof-readers employed. I wrote the majority, I think, of the leading editorials which appeared in that paper during the period mentioned, and with few exceptions, all the descriptions of new inventions that were illustrated, besides performing ordinary editorial work in selecting, arranging, and re-writing matter.

Q. 5. When employed as stated in your last answer, what opportunities did you have for learning of the production of new inventions, and for making yourself familiar with them ?

A. I suppose my opportunities in that respect were exceptional. It was obviously my duty to become acquainted with whatever was new in science, so as to be prepared to explain or discuss it in the paper. I was constantly in receipt of early information from inventors and investigators as to their discoveries, this information being often personally given to me by the parties themselves. I had other sources of information, such as most editors have, in correspondents' letters, exchange newspapers, &c. I was in the habit of reviewing the new scentific books and periodicals as they appeared, and of preparing weekly, large numbers of abstracts of newly issued patents for publication in the *Scientific American.*

Q. 6. What position did that journal occupy among the scientific periodicals of the country, and what was its circulation during the time that you were connected with it ?

A. I believe it was generally then, and still is, regarded as the leading publication of its class in the United States. So far as I am informed, its circulation is far in excess of any other like periodical, either in this country or abroad. That circulation, when I joined the paper, I understood to be about thirty thousand copies weekly, and when I left it its circulation had risen to nearly fifty thousand. I derived this information from the statements of the proprietors.

Q. 7. Apart from your connection with the *Scientific American*, state any other opportunities you may have had for acquiring knowledge of new improvements and inventions?

A. In February, 1877, and before I severed my connection with the *Scientific American*, I was appointed the editor of *Appleton's Encyclopedia of Applied Mechanics*, a work covering the field of mechanical engineering, and, to a considerable extent, that of applied physics. The original idea was to revise Appleton's old *Dictionary of Mechanics*, originally published in 1850, so as to bring it up to the time; but ultimately, for many reasons, it was decided to make the work, almost entirely, over new, and give it a new title. On this task I was engaged for three years, and it peremptorily required of me to make careful studies into a great number of scientific subjects and researches into the state of many arts. In this connection, in 1879, I reviewed all I could find published on the subject of the telephone, and prepared therefrom an article upon that apparatus.

Q. 8. After Reis' telephone, what instrument or instruments did you next learn of relating to the same general subject of the transmission of sounds by electricity?

A. Gray's telephone; and then, I think, La Cam's—both musical telephones.

Q. 9. What did you understand to be the main objects sought in these instruments?

A. Two; first, the transmission of music, by which I mean sounds corresponding in pitch with those emitted, with, for example, any musical instrument; and second, what I regarded as of much greater commercial advantage, harmonic multiple telegraphy, or the sending through a single conductor, of many signals simultaneously, in sounds of different pitch, which would affect, or be separated or disentangled, by reeds, for example, vibrating synchronously with the sounds of varying pitch transmitted—said reeds being located at the receiving station. It is perhaps proper for me to state here, that the idea of transmitting the human voice by electricity was then well known to me, but I regarded the possibility of any apparatus in that direction to be closely limited to the transmission of the pitch of the voice, and to some extent its loudness, and not in anywise to include the transmission of its quality or articulation. In other words, in that connection the human vocal organs became simply a musical instrument, the sounds of which the telephone reproduced in its own particular voice.

Q. 10. Then, if I understand you correctly, those harmonic musical telegraphs, or musical telephones, were able to transmit or reproduce vocal sounds or sounds made by the human vocal organs, by reproducing the pitch, and to some extent the loudness of the sounds, but were not able to reproduce the quality, and hence were not able successfully to transmit and reproduce articulate speech. Am I correct?

A. Exactly; the differences in loudness, however, in the sounds transmitted and reproduced, I do not think were much marked. The main thing transmitted by these instruments was pitch.

Q. 11. Will you please explain, a little more particularly, how the musical telephone was able to be employed as a multiple telegraph; that is to say, by what means two different transmitting instruments could be used with a single electric circuit, and two receiving instruments, in such a manner that one of the receiving instruments would receive the message from one of the transmitting instruments, and the other receiver would receive the message from the other transmitter, without mixing up the messages?

A. I will illustrate this in the simplest way possible. First suppose three tuning-forks, A, B and C; two, A and B, tuned to the same note and the other, C, tuned to a different note. If the tuning fork A be struck, and thus thrown into vibration, it will be found that the tuning-fork B, placed near it, will also be thrown into vibration, through the medium of the sound waves passing through the air, and that the sound due to this vibration of B, will be heard after A is damped. On the other hand, it will be found that the fact of A being set in vibration had no audible effect upon the differently tuned fork C. Or, in other words, that two forks in unison will vibrate together and be set in vibration one by the other; whereas, of two forks not in unison the reverse is true. Extending this a little further; suppose, say half a dozen differently tuned forks, A, B, C, D, E, F, be arranged conveniently together, and suppose three persons should strike three other tuning-forks respectively in unison with A, B and C of the series; then A, B and C only would be thrown into vibration and would respond.

Now suppose the three persons mentioned should strike their tuning forks simultaneously and in a particular way; say that each person should make the signals of a different telegraphic message, in the Morse alphabet, by taps on his fork. Clearly, the result of all these taps sounding together, would be a confused jumble to the ear; but when the combined sounds reached the three tuning-forks, A, B and C, they would be disentangled. The tuning-fork A would be entirely indifferent, audibly, to the vibrations affecting B and C, and would not reproduce them, but would pick out and respond only to those emanating from the fork in unison with it.

A like result is true of forks B and C, and consequently, three messages, made simultaneously, might thus be transmitted through the air, and analyzed at the receiving forks.

It is easy now to apply this to multiple harmonic telegraphy, in which the vibrations are transmitted by the electric current, through a wire, instead of by waves of condensation and rarifaction in the air.

The apparatus in perhaps its simplest form may be described as follows: a battery; a tuning-fork, so arranged that one of its arms when vibrating will make and break the circuit in a wire leading from the battery; then a prolongation of this wire, to form the line; the coiling of this wire around a core, to form an electro-magnet; then the connection of the wire to the other pole of the battery.

Over the pole of the electro-magnet is a reed of steel or iron so arranged as at it its natural rate to vibrate synchronously and in unison with the tuning-fork.

Now, when the tuning-fork is set in motion, at every vibration it will make and break the current, so that the latter will traverse the line in a series of impulses, which in turn intermittently energize the electro-magnet, and this, by attracting and releasing the vibrating reed in front of its pole, causes in the reed vibrations synchronous with, and therefore of like pitch to, those emitted by the tuning-fork.

From what has been already explained, it will be obvious that if another tuning-fork, of different pitch, be arranged in connection with the same line wire, the vibrations transmitted by that fork will not affect the reed at the other end, but will affect a second reed, of like pitch to itself, if inserted in the circuit. This brings me to the conditions named in the question.

If the two tuning-forks alluded to be sounded together, then the electrical impulses from each, moving at different rates at the same moment, will traverse the wire simultaneously, and these will be disentangled by each of the two reeds at the receiving end, vibrating responsively under the impulse of the fork in unison with it. In this manner two messages are sent simultaneously over a single wire, and received by sound, separately from different reeds. Of course, this principle, true for two messages, can be extended to a greater number.

Recess for lunch.

March 4th, 1882, 2.30, P. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Q. 12. When did you first learn of Alexander Graham Bell's alleged invention of the telephone?

A. To the best of my recollection, quite early in 1876. I think it must have been either soon after the issue of his patent of March 7th, or possibly after the delivery of a lecture, or paper, by him before the American Academy of Arts and Sciences, of Boston. I don't recollect paying much attention to the matter at the time, though I have quite a distinct impression, that I then thought it was a harmonic telephonic device, belonging to the same general class as the apparatus referred to in my last answer.

Later in the summer, I heard more about it, and my impression is, that I prepared the article on Bell's contrivance, which appeared in the *Scientific American* of September 9th, 1876, which article I think was the first, that was published in that journal, giving an intelligible account of the device.

Either shortly before or shortly after that date, I was at the Centennial Exhibition and took occasion to look for Professor Bell's telephone, which I heard was there, and failed to find it, although I think at the time I saw Gray's harmonic telephone exhibited there, but not in operation. I first saw Bell's telephone in the square-box form, about as shown in his patent of January, 1877, in March of that year, when one of the instruments was sent to the *Scientific American* office to have an engraving made from it. That engraving, with others relating to the subject, some of which were reproduced from the patent drawings attached to the patent of that date, was published in the *Scientific Ameri-*

can of March 31st, 1877, and I believe that I prepared the accompanying article.

I first personally used and experimented with the Bell telephone, I think, in the fall of 1877, when two small hand instruments, in the ordinary well-known form, were sent to the *Scientific American* office for our examination, I believe. I took these to my residence and tried them on a short line. I might add, that the first really definite information that I gained concerning the Bell telephone, apart from the patent, I heard from Professor Bell himself, in the lecture which he delivered in this city in the spring of 1877.

Q. 13. In view of the statements you have now made, of your opportunities of becoming familiar with the mechanic arts, and of your knowledge of electricity and its associated arts, were you, or were you not, in your opinion, sufficiently familiar with the general state of the art of transmitting sound by electricity, in March, 1876, to have been able at that time to intelligently appreciate the relation of a telephone, that would transmit articulate speech by electricity, to other machines of the same general class, that had been described in prior publications, and with which you were familiar, as you have testified?

A. Yes, I think I was; sufficiently, in part, to have enabled me to do then, as I did afterwards, write about the subject intelligently, for the information of the public.

Q. 14. Have you made any detailed investigation into the state of the art since you were engaged, some time in the fall of 1881, to testify as an expert in this suit?

A. No, sir.

Q. 15. Have you read, and do you understand, the testimony given in this suit on the part of the complainants, by their expert, Professor Charles R. Cross. If yes, state whether you do, or do not, agree with that witness in such opinions as he there expresses, relative to the theory of electric telephones capable of transmitting and receiving articulate speech?

A. I have read, and I understand, the testimony of Professor Cross, heretofore given in this suit, both in the complainant's *prima facie* case, and in the affidavit made by him, which I find in the printed record of Complainants' moving papers for a preliminary injunction. From his application of the theories he offers, specifically to what he finds set forth in Bell's patent of March 7th, 1876, I mainly dissent, for reasons to which I may take another opportunity to refer, as they are not now called for.

I understand the question to confine me to the consideration fo the general theories propounded by Professor Cross, in their broad application to the telephonic apparatus. His statement of the theory of the production of sound, and of the undulatory nature of the movement of the air particles, resulting in vibrations having the three characteristics, of loudness, pitch and quality, fairly and ably describe views which I think are accepted by all scientific men. His explanation of the operation of the two magneto-telephones, one serving as a transmitter, and the other as a receiver, namely; the diaphragm of the transmitter being set in motion by the movement of the air particles due to the production of sound by the voice, and vibrating in accordance therewith, causing electrical currents corresponding in frequency in character to be produced in a closed circuit; and that these currents affect a magnet which in turn influences the diaphragm of the receiver, causing it to vibrate so as to reproduce the original sound, expresses what I believe to be the correct theory, though it is not the only one that has been suggested to explain the phenomena observed, nor does it fully account for all of said phenomena.

In this connection the molecular theory has been advanced, accounting for some of the results observed by supposed changes in the molecular arrangement of the magnets under the influence of the current.

I fully agree with Professor Cross in such statements as he makes relative to the practical impossibility of articulate speech being transmitted by any telephonic system which relies upon a making and breaking of the current in order to transmit the vibrations. I am aware that the fact has been frequently published, that with Reis' instrument, which is constructed on the make-and-break principle, and to which I have already referred, and with other analogous devices, certain sounds of the human voice have been transmitted. But I am unable to discover that these sounds were other than merely fragmentary, depending solely for their existence upon the momentarily continued contact of the diaphragm and point, or their equivalent, and limited, I believe, chiefly to vowel sounds I regard it as certain, that under no circumstances can articulate vocal souuds be transmitted by such an arrangement except when continuous contact between the contact-pieces exists; and even then, I do not know that it has been definitely determined how, exactly, to adjust these pieces for the purpose—in the Reis instrument, for example.

I understood, as early as 1870, the inability of the Reis instrument to transmit articulate speech, and I have never since heard that it has come into use for the transmission of articulate speech; that it has, or is, practicably been made capable of doing so. I am satisfied, therefore, that the use of the undulatory current is essential to the transmission of articulate speech; and conversely, I fully agree with Professor Cross in the opinion substantially expressed by him, namely, that any electric telephonic device which does actually transmit articulate speech, must operate, and operate only, through the medium of the unbroken undulatory current. So that, to illustrate, if I was shown an instrument connected with an electric circuit wire, even if I were wholly ignorant of the internal construction of that instrument, if I heard speech through it, I should be convinced; first, that that instrument was not operated by a make-or-break current; and second, that it was operated by a current unbroken and undulatory. This is my own conclusion, and it seems to me also a necessary one, from the opinions and reasons given by Professor Cross. I also agree with Professor Cross in so much of his explanation of the possibility of operating telephones in general by variations in the electro-motive force of the current; and, as to how vibrations may be caused in the current by the converse method of changing the resistance of a suitable medium, through which the current is conducted. His theories on these points are in the abstract, I believe, correct.

The foregoing, I think, covers all that I am asked in the question.

Q. 16. Please look at the patent of Alexander Graham Bell, dated March 7th, 1876, No. 174,465, and more particularly at the claims thereof, and state what you find set forth therein. You may refer, if you please, to the opinions expressed by Professor Cross, in his testimony heretofore given in this suit, in relation to said patent, and also, if you please, to any general knowledge which you may have had on the subject of electric telegraphs or electric telephones, at and before the date of said patent?

A. I have already referred to the theories advanced by Professor Cross, regarding telephones in general, mainly to agree with him; but in a previous answer I stated that I dissented from his application of his theories to the device set forth in Bell's patent of March 7th, 1876.

ELEPHONE COMPANY,-2

In answering the present question I am necessarily led to give my reasons for my dissenting views.

If I understand Professor Cross correctly, he asserts that he finds set forth in the patent above named, the method, principle and mode of operation of the main forms of speaking telephones made since its date. This statement appears on page 40 of this affidavit in Complainants' moving papers for a preliminary injunction, and he goes on to say, as follows: "So far as I am aware, these various modifications have been introduced in order to increase the partial efficiency of the method so described by Mr. Bell, and every change has been simply an endeavor to effect an improvement in the practical application of the new art set forth in said specification; the new method, which he described in said specification, and referred to in the fifth claim thereof, underlies them all and includes them all."

I trust I shall not be considered as invading the region of argument if I say that it seems to me, in view of the foregoing quotation, that if exactness and certainty are anywhere requisite, it is in a patent wherein the inventor undertakes to instruct people in an alleged great and original conception; for certainly, if an art is wholly new, not much can be left to be supplied by readers skilled in it, for logically there are none such.

If Mr. Bell, as Professor Cross seeks to explain, did, in this patent, bridge the gulf between the old harmonic telephone and the more modern speaking telephone, then, it seems to me that that fact should appear to the student, or at least I should expect to find it, not merely from inference, but clearly and unambiguously described and embodied in an operative contrivance. Professor Cross, in his *prima facie* testimony, refers mainly to the fifth claim of the patent. I have been questioned as to the whole patent, which I have read, and understand. *The first claim* recites, "A system of telegraphy in which the receiver is set in vibration by the employment of undulatory currents of electricity, substantially as set forth."

Adjourned until 10.30, A. M., on Tuesday, March 7th, 1882.

Tuesday, March 7th, 1882, 10.45, A. M.

Examination resumed pursuant to adjournment.

Present, Mr. Storrow for Complainants, and Mr. Hill and Mr. Jacobs for Respondents.

Examination of Mr. Park Benjamin by Mr. Hill continued:

[*Answer resumed.*]

Broadly regarded, I understand that any system of electric telegraphy involves a device for transmitting signals, the conductor through which they pass, a device for receiving them, and a source of electricity. I understand the particular system recited in the claim, to be one in which the receiver is set in vibration by undulatory currents of electricity; that is, in contrast with a system in which the receiver is set in vibration by intermittent, or "make-and-break," currents of electricity. I understand the word receiver here to mean, any form of receiving device capable of being operated in a vibratory manner, by said undulatory current. I do not understand that in this claim the inventor limits himself to any particular manner of vibration of the receiver; and hence, should regard it as immaterial whether the receiver be, for example, a galvanometer, indicating the signal sent, by the vibration of its needle, or a reed vibrating in front of the pole of an electro-magnet, or a lever caused to vibrate by the influence of an electro-magnet, and thus caused to give sound signals by striking a bell, or to operate suitable recording mechanism. All of these devices are means for receiving signals in a system of telegraphy. All vibrate, and all are capable of being worked by an undulatory current.

Professor Bell states, in his specification, as follows: "It has long been known that when a permanent magnet is caused to approach the pole of an electro-magnet a current of electricty is induced in the coils latter, and that when it is made to recede a current of opposite polarity to the first appears upon the wire. When, therefore, a permanent magnet is caused to vibrate in front of the pole of an electro-magnet, an undulatory current of electricity is induced in the coils of the electro-magnet, the undulations of which correspond in rapidity of succession, to the vibrations of the magnet, in polarity to the direction of its motion, and in intensity to the amplitude of its vibration."

This being the case, about as simple a way as can be suggested of recognizing the induced current in the coil of the electro-magnet is to place a galvanometer in the the circuit therewith. Then, I think, there will be present all the elements set forth in the first claim, as the undulatory current will be produced as stated. And such could be done so that it would cause the galvanometer needle to vibrate, to make signals in some particular way, and hence, said galvanometer would be, as already pointed out, a receiver set in vibration by the employment of undulatory currents of electricity.

I think the fact will hardly be disputed, that telegraph systems using the magneto-electric undulatory current, were known and operated long before the days of Bell's invention, and were, in fact, among the first forms of telegraphing used. To this class, for example, belongs the old Wheatstone, A, B, C, system, in which the current was generated by the revolution of an armature before the poles of a magnet, and the current thus obtained was transmitted through coils of wire surrounding said poles, and thence to an indicator, or dial, whereon the signals were shown. Here the currents were produced without at all disturbing the continuity of the circuit, which, in fact, was never broken. Without further description, I will refer, for example, to a work entitled "*Telegraphy*," by W. H. Preece and J. Sivewright, bearing date, "New York, 1876," page 76, for a simple explanation of this system, and also to Dr. Turnbull's lectures on the telegraph, published in the *Journal of the Franklin Institute*, for 1851 and 1852, volumes, 21, 22, and 23, for descriptions of many early forms of telegraph, in which undulatory currents and closed circuits were employed.

I am also aware of a publication of a system of telegraphy, in which the undulatory current is employed in a closed circuit, which appeared in the *Telegraphic and Electrical Review*, a London, England, periodical, volume 1, dated November, 1872, and November, 1873. This reference was brought to my notice since the beginning of this suit, and a certified copy of the article and accompanying illustrations I now produce.

[*Mr. Hill offers the paper produced by the witness in evidence and the same is marked* "*Exhibit Wheatstone Undulatory Current Telegraph*"]

[*Mr. Storrow objects to the name used to designate this exhibit, as a misnomer and misdescription of it.*]

I find described, an apparatus whereby a machine is caused to telegraph to a distance automatically its periodical motions. It is stated, that, as far back as 1840, Sir C. Wheatstone invented an instrument for this purpose involving the use of voltaic electricity. The article then goes on to point out sundry disadvantages of the voltaic battery, and says that the difficulty "was subsequently overcome by the inventor employing magneto-electric currents, and the following is a description of a suitable apparatus for the generation of these currents, in which the current is never broken." The description and drawings set forth an apparatus consisting of a permanent magnet, two coils of wire, with soft iron cores, and a soft iron armature, disposed as shown in figures 1, of the drawings. The armature is attached to a spring, which brings it up to the magnetic poles, and by a suitable mechanism, such, for example, as the eccentric and pitman shown in figure 3, it is caused to approach and recede from said poles, thus inducing alternating currents in the wire coils. These currents are communicated by a leading wire to the register or indicator, shown in figure 2, where it is stated, they act by means of an electro-magnet, upon a "step-by-step" motion, which in turn operates the pointers of the dials, so recording the revolutions of the wheel, for instance.

It is further stated, that in the *Times* printing office several of these automatic registers are employed to record the number of impressions produced by the various printing machines, and that said registers are placed in the office of the manager, and the generators are attached to the presses in the printing room. By this arrangement, it is said, the number of impressions for a given time can be recorded, and any delay in the working of the machines noted.

In view of all the reasons above cited, I conclude, that the first claim of Bell's patent of March 7th, 1876, sets forth nothing but what was old and well known in the act at the date thereof; unless it be understood to relate and refer substantially to the same construction, as is set forth in the fifth claim; and to this I shall more particularly make reference in another part of this answer.

IN THE SECOND CLAIM I find set forth the combination of a permanent magnet, or other body capable of inductive action, with a closed circuit, so that the vibration of the one shall occasion electrical undulations in the other and in itself, and this, under three conditions, namely; first, when the permanent magnet is set in vibration in the neighborhood of the conducting wire forming the circuit; second, when the conducting wire is set in vibration in the neighborhood of the permanent magnet; and third, when the conducting wire and permanent magnet both simultaneously are set in vibration in each other's neighborhood. There is no specific mention, in this claim, as in the preceding claim, of the application of what is there recited to a system of telegraphy. Regarding the claim broadly, it merely recites a well known

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and fundamental experiment in magneto-electric induction, dating, I think, from 1831, or thereabouts. This consisted simply in connecting a continuous coil of wire with a galvanometer and inserting a permanent magnet in the hollow of the coil. By causing the magnet and the coil to alternately approach and withdraw from each other, momentary induced currents, flowing alternately in opposite directions, are produced in the line, and are received and shown in the galvanometer. This experiment, and the laws which it demonstrates, lie at the foundation of the construction of modern magneto electric machines for mechanically producing an electric current. The references already given with regard to the first claim also substantially apply to this one, for the same reasons, so far as they show the combination of the permanent magnet and closed circuit, as set forth. Hence, regarding this claim, I reach the same conclusion as already noted with reference to the first claim, namely, that it describes no invention of Mr. Bell's; unless it be understood as referring to the same construction as set forth in the fifth claim, hereafter to be referred to.

THE THIRD CLAIM recites a method of producing undulations in a continuous voltaic current by the vibration or motion of bodies capable of inductive action, or by the vibration or motion of the conducting wire itself, in the neighborhood of such bodies. As a permanent magnet is a body capable of inductive action, and is so referred to in the preceding claim, this third claim substantially recites the addition of a voltaic current to the circuit, in which magneto-electric currents circulate. It therefore takes a subsidiary part, so far as the production of undulations in the current is concerned. When, however, permanent magnets are not used, then the voltaic current may energize the electro-magnets, or maintain a current passing through the circuit, in which undulations may be produced by the vibration of bodies capable of inductive action, or of the wire near such bodies. This, broadly regarded, amounts simply to the statement of a well known result, founded on many experiments, and described mainly by Faraday, on which he founded many of the laws of galvanic induction. Without going into further detail, it will suffice me to say, that I regard this claim very much in the same light that I do the others referred to; and that is, that it cannot, in view of the state of the art, be given the broad signification which might otherwise be attached to its language, but must be taken, as in the case of the two preceding claims, with reference to what is recited in the fifth claim.

With regard to the three claims thus far considered, and the specifications relating to them, while I do find set forth therein a telegraphic system operating by undulatory currents, I find nothing specifically denoting that the signals in this system are to be received by sound, to the exclusion of other means of receiving the signal. It is true that the specification describes a system in which sound is the medium through which the messages are read; but I do not understand that the inventor confines himself thereto, nor can I conclude otherwise than that, in the three claims mentioned, signals sent by an undulatory current and made appreciable to the eye, say by the movement of a needle, are included in the language used. If, therefore, signals received by sound are not to be regarded as specifically referred to in the first three claims, it certainly seems to me that signals to be received in a particular variety of sounds, namely, articulate speech, are still further from being specifically set forth therein.

IN THE FOURTH CLAIM I find recited two processes for producing undulations in a continuous voltaic circuit; first, by gradually increasing or diminishing the resistance of the circuit, or second, by gradually increasing or diminishing the power of the battery.

Professor Cross says that it was well known before Mr. Bell's patent that the strength of a current could be varied either by varying the electro-motive force, or by varying the resistance. Consequently, in consulting the specification to find out what Professor Bell's process is for producing undulations in his circuit by varying the resistance, I naturally look for some particular way of doing this, because the fact that it could be done, gradually or otherwise, was already admittedly well known. All I find on this subject is the following: "The internal resistance of a battery is diminished by bringing the voltaic elements nearer together, and increased by placing them further apart. The reciprocal vibration of the elements of the battery, therefore, occasions an undulatory action of the voltaic current. The external resistance may also be varied. For instance, let mercury or some other liquid form part of a voltaic circuit, then the more deeply the conducting wire is immersed in the mercury or other liquid the less resistance does the liquid offer to the passage of the current. Hence, the vibration of the conducting wire in mercury or other liquid included in the circuit, occasions undulation in the current."

There certainly was nothing new, at the date of Mr. Bell's patent, in altering the internal resistance of a cell by moving the plates farther apart or nearer together, and so changing the thickness, and hence, the resistance of the column of liquid between them. This knowledge I take to be about as old as the invention of the galvanic battery itself. Consequently, I conclude that Professor Bell's invention, if he has made any in the matter, must lie in the means for gradually moving the elements. But he doesn't describe any means, either generally or in detail; gives no drawing illustrating the same; nor in fact, so far as I can see, imparts any information on the subject, other than that, as a result of so moving the elements in a battery gradually, undulatory currents may be produced. From which information I fail to conceive how anybody could make an operative contrivance. In referring to varying the external resistance, he is a little more specific, but he tells nothing as to how his apparatus is to be arranged; gives no drawing of it, nor, in fact, presents such information as I should consider necessary to produce an operative machine.

The reference in the second part of the claim to increasing or diminishing the "power" of the battery, is rather vague, from the undefined use of the word "power," which, however, I infer here stands for strength of current. In this connection the specification says: "The vertical vibrations of the elements of a battery in the liquid in which they are immersed produces an undulatery action in the current by alternately increasing and diminishing the power of the battery." It was well known long before the date of Mr. Bell's patent that if you lift the elements of a cell out of the solution altogether, you stop its working; and that the deeper you lower the plates, for instance, in the liquid, the greater the working area of the plate, and hence, the greater the strength of the current. Arrangements for raising and lowering plates in a battery appear in the old Hare Calorimotor, which is published in *Appleton's Dictionary of Mechanics*, of 1851, volume 1, page 433. Consequently, I conclude again, that if Professor Bell has invented anything in this connection it should appear in means for gradually raising and lowering the elements of the battery, so as to produce undulatory currents. But I find no such means described in the patent; no drawings of anything of the sort; and all the information on the subject which is given appears to be summed up in the sentence quoted, from which, it is hardly necessary to point out, an operative device could not be made.

Consequently, in the fourth claim, duly considered with the specification, I do not find such information as will enable anyone skilled in the art to construct the apparatus referred to, or any information regarding any principle or general discovery which, so far as I am aware, was not already known.

Recess for lunch until 2.20, P. M.

March 7th, 1882, 2.20, P. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

[*Mr. Benjamin continues.*] I am aware that Professor Cross, in his testimony in Complainant's *prima facie* case in this suit, dwells upon the FIFTH CLAIM of the patent, which appears to be the one put in issue by the Complainants, and leaves out particular reference to the four claims which I have thus far discussed. With the subject matter, which he finds set forth in this claim, and the specification, he compares the Klemm transmitter and the Tisdel receiver, which apparatus, he says, "Contains a transmitter, which, from its construction, is adapted to produce electrical undulations, as described, and a receiver, which is adapted to retranslate these electrical undulations into vibrations of the air." In examining his testimony in comparison with the patent, I have been at a loss to understand why he limits himself, or was limited, to the consideration of this fifth claim only; because, according to his own reasoning, if the apparatus contains what he finds in it, apparently it includes the elements set forth in the other claims. I mention this merely as a circumstance affecting my mind, in support of the view I have taken regarding the first three claims of the patent; that is, that they are either unjustifiably broad, in view of the state of the art, or else must be understood as setting forth no more than is found in the *fifth claim.* I propose now to examine this fifth claim and specification in detail.

It is the only claim in which the transmission of sound is mentioned; and it specifically says, "vocal or other sounds." A vocal sound is not necessarily speech, so that, if it be assumed that the term is meant to include articulate speech, in view of the state of the art, which shows that some vocal sounds could be transmitted by the Reis telephone, for example, that fact I must gather from the specification. In the specification and drawing, I find, described and illustrated, a device consisting of an electro-magnet, *A*, having a coil only upon one of its legs, *b*; a steel spring armature, *c*, clamped by one extremity to the uncovered leg, *b*, of the magnet, and its free end allowed to project above the pole of the covered leg. In voltaic circuit with this instrument is placed a similar instrument, the circuit being closed through the coils of the electro-magnets, and a battery. One of these instruments, I understand, is used as a transmitter, the other one as a receiver, and when the armature of the transmitter is set in vibration, to produce its musical note, the specification says: "A powerful inductive action takes place, and electrical undulations traverse the circuit; the vibratory current, passing through the coils of the electro-magnet of the receiver, sets the armature of that instrument in vibration when the armatures of the two instruments are in unison with each other; but the armature of the receiving instrument is not affected by the passage of an undulatory current when the pitches of the two instruments are different."

Referring back, now, to the beginning of the specification, Professor Bell mentions a prior patent granted to him for a multiple harmonic telegraph apparatus using a "make-and-break" current, and constructed and operating in substantially the same way as the typical instrument of that class, which I explained in a previous answer. Further on in the specification he says that, in a pending application for letters patent, he describes two ways for producing an intermittent current; one by "make-and-break" of contact, the other by alternately increasing and diminishing the intensity of the current, without breaking circuit. This last current he calls a "pulsatory current." Then, he says, that his "present invention consists in the employment of a vibratory or undulatory current of electricity, in contradistinction to a merely intermittent or pulsatory current, and of a method of, and apparatus for, producing electrical undulations upon the line wire." Then he goes on to give a list of the advantages which he claims to derive from the use of the undulatory current, which are, first, that more signals can be transmitted simultaneously in the same circuit; second, that a closed circuit and single main battery may be used; third, that communication in both directions may be established without the necessity of induction coils; fourth, that cable dispatches may be transmitted more rapidly than was hitherto possible; and fifth, that, as the circuit is never broken, a spark-arrester becomes unnecessary. How he is enabled to transmit a large number of signals simultaneously is described in the specification, and is shown in figure six of the drawing. He shows how a number of instruments constructed as already explained, may be placed upon a telegraphic circuit; points out how signals from one instrument of a given pitch will be repeated by all other instruments in the circuit having armatures normally vibrating in unison with it and by none others; and states that, hence by these instruments, two or more telegraphic signals or messages may be sent simultaneously over the same circuit, without interfering with one another. So far there is described a system of multiple harmonic telegraphy, to which the undulatory current is applied. Mr. Bell now goes on to state that not only is the pitch of his musical notes transmitted, but also the loudness; and although he doesn't indicate any particular advantage to be derived from this, still it is none the less true, that in transmitting sounds in both pitch and loudness, he accomplished something which could not be certainly done in any of the earlier forms of "make-and-break" telephones that I know of. I said in a previous answer that the Reis telephone, for example, transmitted loudness to a certain extent; but when it did this, the effect, I think, was an accidental one, depending upon temporary contact of the contact-pieces; and although it can be explained by what has since been learned, I am not aware that it was at all explained when the Reis invention was originally made public. Besides stating that his apparatus will transmit musical notes differing both in loudness and pitch, Mr. Bell explains in some detail the graphic method of representing an electrical undulation by curves, represented in figure 4, which curves show pitch and loudness, the one by the length of the waves, the other by their height or depth.

I desire to call attention to the fact now, that Professor Bell nowhere says that the curves, which he represents, show anything but pitch and loudness, nor does he intimate, in any part of the specification thus far referred to, that his instrument is capable of transmitting any other characteristic of sound than these two. But Professor Cross has clearly pointed out, and I have agreed with him, that in order to transmit articulate speech, it is absolutely necessary that the instruments should be capable of transmitting the third characteristic of sound; namely, quality, in addition to the other two characteristics of pitch and loudness. It is on this capability that, as Professor Cross shows, the very existence of the electric speaking-telephone may be regarded as depending. Without this capability, no instrument can be an electric speaking telephone, because, admittedly, in the devising, no matter now by whom, of instruments which possess the power, it is that the great and original feature of the invention of the electric speaking telephone resided. Now I understand it to be substantially asserted by Professor

Cross on the part of the Complainants, that all mankind was ignorant of the possibility of constructing such an instrument; that all inventors stood non-plussed before the problem until Professor Bell revealed its solution to the world in the patent now under consideration. Hence the pertinence and the importance of careful scrutiny on my part of what is set forth in this patent, to find out how far, if at all, it gives this information. In this connection, therefore, I have deemed it proper to look at Mr. Bell's testimony in this case; and more particularly to such statements as he makes regarding the knowledge he possessed of the theory of sound, prior to making application for this patent. With all the characteristics of sound he appeared to be well familiar, and had indeed made a special study of the subject. He even made a "Phonautograph" and reproduced thereby, as he says, sound-tracings, somewhat, I understand, analogous to those represented by illustrations in Professor Cross' testimony in this case, showing in themselves, graphically, all the three characteristics of articulate speech. Hence I infer that he was familiar with the appearance of such graphic representations. Knowing these facts, therefore, as to the extent of Professor Bell's information, I am forced to conclude that, when he omitted mention of the possibility of the instrument described in his patent under consideration transmitting *quality*, he did so purposely and advisedly. From all I can gather from his testimony, and from his statements in his patent, he seems to have known what had been accomplished in the way of transmitting sound by electricity, and I cannot conceive of any one having such knowledge deliberately leaving out in a patent all specific reference to a capability of his instrument, whereby would have been effected, had it been present, such an enormous advance in the art, or even his leaving the same to be discovered by inference at a later day. In the list of advantages which I have quoted, he makes no mention of this, which would have been immeasurably the greatest of all. He says in his specification, that the sinusoidal curve *A* or *B*, figure 4, represents graphically the electrical undulations induced in the circuit by the vibration of a body capable of inductive action, and adds nothing to show that he doesn't intend the curve to represent all the vibrations induced, so far as he intended them to be transmitted. And finally, as if to clinch the conclusion, that he left out reference to quality in this patent, the main portion of which is given up to the description of a multiple harmonic telephone, I find him specifically stating in his testimony, in answer to interrogatory 65, that it is of no advantage whatever for a system of multiple harmonic telegraphy to transmit quality as well as pitch of sound.

Adjourned until March 8th, 1882, at 10.30, A. M.

March 8th, 1882, 10.30, A. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Examination of Mr. Park Benjamin by Mr. Hill continued.

(*Answer resumed.*) I have already referred to the fact, that in his testimony, in Complainant's *prima facie* case in this suit, Professor Cross examines specifically only the fifth claim of Bell's patent of March 7th, 1876, and, after explaining in some detail what he considers to be the theory of the apparatus which he finds referred to in that claim, in his answers to the 11th and 12th interrogatories, he describes more particularly what he regards to be the apparatus itself, and its functions; and this apparatus, he states, he finds represented in figure 7 of the drawings attached to Bell's patent of March 7th, 1876. I was somewhat at a loss, at first, clearly to comprehend why Professor Cross singled out this particular apparatus to the exclusion of the conclusions I have reached, and which I have expressed, concerning the subject-matter of the first three claims to what is recited in this fifth and last claim; and in order to obtain, if possible, a clear understanding of Professor Cross' position in the matter I have referred back to the somewhat fuller statements which he makes in his affidavit used in Complainant's motion for a preliminary injunction in this suit. There I find that Professor Cross gives reasons for this specific reference to figure 7, very clearly and succinctly, in the following words which I quote from page 35 of his affidavit, folio 46: "The instrument shows at A, figure 7, is a mechanical, but a most essential, modification of A, figure 5; both depend upon the same electrical principle, but *by reason of the entire change of structure*, shown in figure 7, it has become capable of transmitting vocal sounds of all kinds, including articulate speech." I have italicized the words in the preceding quotation, because, taken all together, I think this to be about the most important statement Professor Cross has made affecting this case. There seems to me to be but one meaning possible of the language he uses, and that is, that when Professor Bell changed his contrivance from the form shown in figure 5 to the form shown in figure 7 he then solved the problem of transmitting articulate speech by electricity. Both devices, as shown in figure 5 and figure 7, substantially says Professor Cross, are alike in electrical principles, but, in the apparatus shown in figure 7, something new comes in the form of a "most essential modification" of the apparatus shown in figure 5, which involves an "entire change of structure," and through this modification the wonderful result of transmitting articulate speech by electricity is made possible. It is hardly necessary now for me to dwell upon the importance of finding out, by comparison of the apparatus shown respectively in figure 5 and figure 7, what this modification is.

I have already stated what I find in figure 5, namely, an electro-magnet having a coil on one leg, and a steel spring armature extending over and vibrating in front of the pole of the electro-magnet; another instrument of the same construction, and a voltaic circuit connecting them through the coils. And referring to figure 7, I find an electro-magnet having on one of its legs a coil, exactly as in figure 5; an armature attached by one extremity to the uncovered leg, in a manner substantially like that shown in figure 5, with the free end of the armature vibrating in front of the pole of the electro-magnet, also as in figure 5. Connected with this instrument is a voltaic circuit, also as in figure 5; and in this circuit is another instrument constructed in the manner already described, and again also as in figure 5. The circuits shown in figures 5 and 7 are both closed circuits through the coils; the first being closed entirely through wire, and the second being closed through the earth, which is here an immaterial difference. The construction of the instruments is so far the same; they are arranged in a like circuit in the same way, and they are both capable of performing the same result. The difference shown in the method of attaching the armature to the uncovered leg of the magnet, in figure 5 by clamping, and in figure 7 by hinging, is immaterial, in view of the fact that in the first case the magnet is shown standing upright, and in the second turned on its side. So far then, as I have described them, the two instruments shown in figures 5 and 7, are substantially, and nearly identically, the same; so that it will be obvious that the apparatus shown in figure 7 includes all that there is of the apparatus shown in figure 5, and something more; and that in this something more, I must now necessarily look for the "most essential modification" and "entire change of structure," which, according to Professor Cross, gives to the apparatus the extraordinary capability, which, by inference, he asserts the apparatus shown in figure 5, did not possess.

Now, all that there is shown and described in figure 7, which is not shown and described in figure 5, are the cones, *A* and *L*, with the membranes, *a* and *i*, stretched across their inner ends. The patent says, that the function of the cone *A* is to converge sound vibrations upon the membrane *a*, which vibrations are transmitted from that membrane to the armature, *C*, of the magnet. Similarly the vibrations of the armature of the receiving magnet are transmitted to the membrane of the other cone, *L*, which cone converges these vibrations into the ear applied to its small end.

It is certainly clear that the cone and membrane here take no part whatever in the electric transmission of sound. They serve no other purpose, and none is suggested for them, than that of concentrating upon the armature or ear-drum, vibrations which otherwise might be widely diffused in the air, and in great measure lost. For this purpose, the use of a cover or tube and membrane was perfectly well known long before the date of Mr. Bell's patent. It is nature's contrivance in the human ear, and it existed in the "Phonautograph," which Mr. Bell made and describes. If the instrument was not capable of transmitting articulate speech before the cone and membrane were added, it certainly could not do so by their aid. They would be of no more use than that of a telescope to a blind man, or an ear-trumpet to a person devoid of hearing; in fact, in the present connection they are nothing but an ear-trumpet—an instrument with which Professor Bell, professionally, was doubtless very well familiar. In fact, an inspection of the drawing, figure 7, leads to the assumption that he has merely taken an ear-trumpet and cut it in two. You make a sound into the large end of the trumpet, just as before, and the instrument attached to that section of it transmits the sound through the wires to the other instrument attached to the other section, or small end of the ear-trumpet, which—as it always was—is applied to the ear of hearer. And this is all I can discover of the most "essential modification," and the "entire change of structure," which Professor Cross says renders the apparatus shown in figure 7 capable of transmitting articulate speech, whereas the apparatus shown in figure 5 was not. As a matter of fact, I think there is no entire change of structure in any essential part of the contrivance, as shown in the two figures. The patent itself says, that the instrument shown in figure 5 may be put to the use of the "telegraphic transmission of noises or sounds of any kind;" and I think it is perfectly obvious that if the armature is made as shown in figure 5, it will be caused to vibrate by sounds made near it, though in not so efficient a degree as when the sounds are concentrated upon it through the medium of the cone and membrane. But certainly I am unable to see any reason for the opinion expressed by Professor Cross which, as I have shown, amounts to the assertion, that the addition of the cone and membrane enables the instrument to transmit quality of sound, and hence, articulate speech.

Recess for lunch until 2, P. M.

March 8th, 1882, 2, P. M.

Examination resumed, pursuant to adjournment.

Present same counsel.

Examination of Mr. Park Benjamin by Mr. Hill continued.

(*Answer resumed.*) In the present connection I shall only say further, that if a cone and membrane, as shown in figure 7, is of the great importance that Professor Cross attaches to it, Professor Bell doesn't seem to have held a like opinion; for in his present form of magneto-telephone, he doesn't use such a cone and membrane, nor in fact, are the latter devices employed in any form of modern speaking telephone which I can now call to mind.

Furthermore, there is no specific statement in the patent that the apparatus shown in figure 7 is capable of transmitting articulate speech, any more than there is of the apparatus shown in figure 5. What is said of figure 7 is, that it shows a mode whereby motion can be imparted to the armature "by the human voice, or by means of a musical instrument." As I have already pointed out, sounds produced by the human voice are not necessarily articulate speech at all, and therefore, to construe the words quoted as indicating the capability of the apparatus to transmit such speech is, at best, a mere matter of inference, which, for the reasons already given, I do not consider justifiable.

Again reverting to Professor Bell's testimony, he says, in answer to the 101st interrogatory, that he began preparing the specification for his patent in question as early as September, 1875, at least four months before he made application for his patent. In answer to the 102d interrogatory he reads rough drafts of parts of his specifications and his claims made in October, 1875; and in the third claim, quoted on page 488 of his testimony, he recites: "The phono-telegraph, whereby the exact pitch, loudness and *timbre* of vocal or other sounds can be transmitted telegraphically," &c. All of this shows to me, first; that Professor Bell took abundant time for consideration before applying for his patent; and even went so far as to frame a claim for an instrument capable of transmitting quality of speech as well as pitch and loudness, and hence sound, with all the characteristics of articulate speech. Yet, there is no such claim embodied in his patent as issued, and not a word in it about the possibility of the instruments described, transmitting *timbre.* All of which is further evidence to my mind of his intentional omission of any claim, or statement to that effect in the patent under consideration.

There is now one more question regarding what I find in this patent which addresses itself very forcibly to me for solution, and that is this: Apart from all other considerations, is there set forth in Bell's patent of March 7th, 1876, a description of any apparatus, which, if constructed from that description by a person familiar with what had been done towards transmitting sound by electricity at the date of Bell's patent, would be an operative speaking telephone? The only way fairly to test this is to make the apparatus as set forth in figure 7 of the patent, to which, as I have said, Professor Cross specifically refers, and try the instrument in a voltaic circuit, as described. This I have done, and the instrument I now produce.

[*Mr. Hill puts the instrument in evidence as* "*Defendant's Exhibit Bell Telephone,* 1876 *Patent.*]

[*Witness continues*:] This instrument was made under my direction in the following manner: I took an ordinary printed Patent Office copy of the specifications and drawings to the Benton Manufacturing Company, a concern in this city chiefly engaged in the manufacture of models and fine experimental machinery. I instructed the workman to make the apparatus shown in figure 7 of the drawings, from what was shown in that drawing and described in the specification. I cautioned him particularly, accurately and carefully to follow the directions contained in the specification and drawing, and not in any way to allow himself to be influenced by any knowledgo of telephonic devices, which he might have, or obtain, outside of what the patent set forth. I told him I wanted a fair reproduction from him of what was in figure 7, of the patent, using his mechanical skill, and departing from the exact dimensions of the drawing, figure 7, so far as was necessary, only to enlarge the device to adapt it for convenient practical use. It is proper to state here, that I understood the printed patent office drawing in this case, as before stated, to be a photo-lithographic reproduction of the original drawing, filed in the patent office, reduced in size. The instruments I have produced are those given to me by the Benton Manufacturing Company, in accordance with my order and instructions, as above detailed. I have carefully compared them with what is set forth in specification and drawing of Bell's patent, of March 7th, 1876, and I consider them to be a fair and substantially accurate embodiment of what is there shown, in figure 7, and described. They are about four times as large in dimensions as the reduced photo-lithographs figure 7, with the corresponding features of the instruments now produced, and I find them to closely correspond. On December 14th, 1881, I personally tested these instruments, on a closed electric wire circuit, in the shop of Daniel Drawbaugh, at Eberly's Mills, Pennsylvania. I went there because there were facilities there convenient for doing this work, and because I was then staying in Harrisburg, expecting shortly to be called to testify in this case. The method and means used in the test were as follows: The circuit extended from a room in the upper story of the shop, first cross-wise and then length-wise of the building on that floor, and then down to a corner room to the floor beneath. The distance between the two points, measured along the wire, being probably some twenty feet. I satisfied myself that ordinary speech or even quite loud tones could not be heard between the two rooms, at the ends of the line. In the wire circuit was placed a battery consisting, I think, of a single Leclanché cell. For purposes of comparison with these Bell telephones, I used two Tisdel magneto telephones, which I understood and believe to be constructed substantially as set forth in the Tisdel patent, in evidence in this case. I didn't make any comparison to determine this fact, because all I needed was two good working speaking magneto telephones, and I found that the two Tisdel instruments were such. I began by personally attaching one of those Tisdel instruments at each end of the line. I then caused another person to speak into one instrument, while I listened at the other instrument, and distinctly heard him. Then we changed places and I was spoken to, using the instrument to which I had previously listened as a transmitter, and in this way I satisfied myself that both of the Tisdel instruments used were efficient as receivers and transmitters, articulate speech being clearly and distinctly heard through them by me. This also demonstrated that the circuit was perfect. Stationing a person at the Tisdel instrument, up-stairs, to talk, I went to the room below at the other end of the line, took off the Tisdel instrument then and there affixed, and in its place attached the Bell instrument, corresponding to the one shown on the right of figure 7, and marked L, in the drawing attached to Bell's patent, using it thus as a receiving instrument, as substantially set forth in Bell's specification. On listening at this instrument I could hear no sound through it at all. I satisfied myself that the sound was going on all the time upstairs, by quickly taking off the Bell, and putting on the Tisdel instrument, several times, without giving the speaker above any warning of my intention to do so; and then from the Tisdel instrument, I could hear speech coming clearly and distinctly while on replacing the Bell device, I could, as before, hear nothing. This satisfied me that the Bell instrument was inoperative. Removing now, the Bell receiving instrument, from the line, I attached to the latter, at one end, the apparatus I had had made, in correspondence to the instrument shown at the left of figure 7, and marked A, in the drawings attached to Bell's patent, of March 7th, 1876, and at the other end a Tisdel instrument. I now used the Bell instrument as a transmitter, substantially as set forth in Bell's specification, and the Tisdel instrument as a receiver. I stationed myself at the receiving end of the line, causing another person to talk into the Bell instrument, at the transmitting end, and listened at the Tisdel instrument. I could hear nothing, although I satisfied myself that speech was going on, by stepping out of the small room in which the receiver was placed, and going to the stairway near by, where I could hear the voice of the speaker. This I did at intervals, without informing the speaker of my intention of so doing. I also attached the Bell instrument to the line myself, and did it in a particular way, twisting the connecting wires in such a way that I would know if they had been tampered with, and not telling anybody that I had done so. When I examined these connections, after the experiment, I found them as I had left them, showing to me, therefore, that the talking had been done into the Bell telephone, and not into another instrument substituted in its place.

This experiment proved to me, therefore, the inoperativeness of the Bell transmitter, as shown in Bell's patent of March, 1876, and of course the conclusion from both experiments was that the Bell transmitter would not transmit speech through an operative receiver, nor the Bell receiver receive speech through an operative transmitter; and this despite the fact, that Professor Cross has substantially testified that the

Tisdel instrument, which was the operative instrument I used, is an infringement upon Bell's patent of 1876.

It only remained now to connect the two Bell instruments, to and at opposite ends of the circuit, as shown in figure 7, and as described in Bell's specification. This I did, and caused another person to talk into the transmitter, and listened myself, at the receiver, taking such precaution to assure myself that speech was going on, as already detailed. Again I could hear nothing—no sound of any kind reaching my ear through the receiver. This completed my experiments, on the Bell instruments which I have produced, and thus finally demonstrated to me their inoperativeness for the purpose of transmitting, or receiving articulate speech by means of electricity.

In conclusion, and for the reasons which I have endeavored to give fully, what I find set forth in the Bell patent is a harmonic telephone, single or multiple, having for its important new features, so far as I can discover, the application of an undulatory current of electricity, whereby the apparatus is enabled to transmit both pitch and loudness. Thus regared, I consider the invention an important one, and as accomplishing a material advance in the art, as compared with telephones before known, which could certainly transmit pitch only. I do not find, for the reasons stated, in Bell's patent of March 7th, 1876, a speaking telephone, either directly or by inference from the language used, or from the drawings, and I have determined to my satisfaction, by actual test, that the specific apparatus which the Complainant has sought to prove is a speaking telephone, is wholly inoperative as such. As regards other forms of telephone, such as those depending upon variations of resistance for producing undulations in the current, I find no information in the specification or the drawing, which would enable a person skilled in the art at the date of said patent to make an operative device of that kind.

Q. 17. In Defendant's "Exhibit Bell Telephone 1876 Patent," as it appears here to-day on the table before us, the little metal studs that connect the hinged armatures to the centres of the diaphragms, have become loose or disconnected from the diaphragms. How were they at the time of your described experiments?

A. They were attached to the diaphragms by cement, some of which is still visible. I will state here, that during the progress of manufacture of the instruments, the workman asked me for information as to how to fasten those studs and diaphragms together. I told him he would have to get that out of the patent, whereupon he informed me that he couldn't find it there. I instructed him, nevertheless, to go on and do the best he could with the information he did find in the patent; and the result of it was his sending me the instruments with the studs shouldered upon the diaphragm and fastened thereto with cement. This attachment kept the parts together while I was experimenting, but they seem to have become loosened and separated through handling since I used the apparatus. They have been subjected to no rough usage, to my knowledge.

Q. 18. Do you know of any particular in which the instruments, as you used them, differed from the instruments shown in figure 7 of the drawing of Bell's patent of March 7th, 1876, and described in the specification thereof?

A. There is a slight difference in one point, which I should have mentioned before. During the progress of manufacture, the workman inquired of me how the uncovered leg of the magnet was to be fastened to the cone; and he called my attention to the fact that there is nothing in the patent explaining this, which is true. Then I told him to use his judgment in the matter, and the consequence of that instruction was, the attachment of the magnet to the cone by the piece of brass and two screws, as appears in the instrument. This extra piece of brass, with its screws, is not shown in the patent, and in my opinion is an immaterial variation from what is shown in the drawing, figure 7, so far as the actual operation of the telephone may be affected by it. This is the only difference, that I am aware of, between the two instruments produced and what is shown in figure 7 of the drawing attached to Bell's patent.

Q. 19. In making your experiments with these instruments, as you have described, did you omit any precaution or condition necessary to fully and fairly determine their operative efficiency for transmitting and receiving articulate speech?

A. No, not that I am aware of.

Q. 20. You have analyzed the Bell patent of March 7th, 1876, No. 174,465 and have given us your opinion of that patent, and of the instruments therein described, and your reasons for differing from Professor Cross in regard to the invention contained in that patent; will you now please examine the letters patent granted to Alexander Graham Bell, January 30th, 1877, No. 186,787, and the statements of the inventor, contained in the specifications thereof, and state how, if at all, your conclusions are affected thereby, giving your reasons in full ?

Adjourned until March 9th, 1882, at 10:30 A. M.

March 9th, 1882, 10:30 A. M.

Examination resumed, pursuant to adjournment.

Present same counsel.

Examination of Mr. Park Benjamin by Mr. Hill continued.

A. I have examined, and I believe I understand, Bell's Letters Patent referred to in the question. I have carefully considered the statements therein set forth, which so far as they affect the opinions I have already expressed, tend to confirm me in such opinions, and this is for the following reasons:

In the specification of his patent of January 30th, 1877, and before entering upon a description of the devices therein set forth, Professor Bell reviews some of his previous patents, and among them his patent of March 7th, 1876, which formed the subject of my preceding answer. In this patent of March 7th, 1876, he says: "I have shown and described a method of an apparatus for producing musical tones by the action of undulatory currents of electricity, whereby a number of telegraphic signals can be sent simultaneously over the same circuit, in either or both directions, and a single battery be used for the whole circuit;" and then, referring generally to all the patents, which he mentions, including the patent of March 7th, 1876, he goes on to say: "In the applications and patents above referred to, signals are transmitted simultaneously along a single wire by the employment of transmitting instruments, each of which occasions a succession of electrical impulses differing in rate from the others, and are received without confusion by means of receiving instruments, each tuned to a pitch at which it will be put in vibration to produce its fundamental note by one only of the transmitting instruments. A separate instrument is therefore employed for every pitch, each instrument being capable of transmitting or receiving but a single note, and thus as many separate instruments are required as there are messages or musical notes to be transmitted." Also in reference to his patent of March 7th, 1876, Professor Bell, in his specification before me, states that he has shown therein "as one form of transmitting instrument, a stretched membrane to which the armature of an electro-magnet is attached, whereby motion can be imparted to the armature by the human voice, or by means of a musical instrument, or by sounds produced in any way." The foregoing quotations are Professor Bell's own statements of what was contained in his patent of March, 1876, made nearly a year after the issue thereof. In them I find no reference to the capability of the apparatus described for transmitting articulate speech. I understand the concluding words of the last quoted paragraph simply to refer to the means whereby sound may be produced, and not to the particular kind of sound and manner of its production. I think the statements quoted correctly summarize what was set forth in Bell's patent of March 7th, 1876, and that they obviously accord with the opinion I have expressed, to the effect that that patent describes only a harmonic musical telephone, single or multiple, and not a telephone for transmitting articulate speech.

Inferentially, I find further confirmation of this view in Professor Bell's statements in his specification of January 30th, 1877, as to the object of the invention therein set forth; in which statements he particularly mentions that the object of the device described in said patent is the electrical transmission of articulate speech; and this he sets forth fully and clearly. My inference is, that, if that important feature was included in his earlier patent, he could just as fully and clearly have mentioned it there; and also, that by not so mentioning in that patent, and by fully doing so in his later one, he gives it to be understood that the invention was originally and for the first time described to the public, in a patent, in that which he obtained on January 30th, 1877.

In considering more particularly the claims of Bell's patent of January 30th, 1877, in comparison with what is set forth in the earlier patent of 1876, the making of which comparison I understand to be called for by the question asked me, and in attempting to reconcile the statements in the latter patent with those in the earlier one, as interpreted by Professor Cross, I am led into a sort of dilemma.

THE FIRST CLAIM of the patent of January 30th, 1877, recites: "The union upon and by means of an electric circuit of two or more instruments, constructed for operation substantially as herein shown and described, so that if motion of any kind or form be produced in any way in the armature of any one of the said instruments, the armatures of all the other instruments upon the same circuit will be moved in like manner and form, and if such motion be produced in the former by sound, like sound will be produced by the motion of the latter." As I understand Professor Cross' testimony in answer to interrogatories 11 and 12, Complainant's *prima facie* case, he finds in figure 7, of Bell's patent of March, 1876, an apparatus consisting of two instruments united upon and by means of an electric circuit, and so constructed that, if motion of any kind or form be produced in the armature of one of the instruments, the armature of the other instrument is caused to vibrate in correspondence therewith. Taking this view of the claim it follows that Professor Cross finds all that is therein set forth as already existing and patented in Bell's prior patent, in which case the claim recites no original invention existing in the later patent of January 30th, 1877. If this view is not correct, then I must understand that the words "two or more instruments" in the claim refer specifically to the instruments described in the specification, and that the claim is thus intended to be limited. The claim states that the specific instruments are constructed "for operation" substantially as shown and described, and the result of this operation is the transmission of articulate speech, and this taken into consideration with what I have already quoted from Professor Bell's statements in this patent, lead me to the conclusion that the claim refers to instruments having the capacity of transmitting articulate speech, which capacity is now for the first time set forth in this patent and not in any preceding one; that is to say, Professor Bell having apparently made the discovery, now for the first time specifically describes and claims operative means for carrying it into practice.

THE SECOND CLAIM of the patent of January 30th, 1877, has more particular reference to the production, in the armature of each receiving instrument, of any given motion by subjecting said armature to an attraction varying in intensity, however such variation may be produced in the magnet; this, in a system of electric telegraphy or telephony, consisting of transmitting and receiving instruments united upon an electric circuit. This is what is set forth in the first sentence of the claim, and it is difficult to see any substantial variation between what is thus recited and what is set forth in the first claim of the patent of March 7th, 1876, wherein is set forth "a system of telegraphy in which the receiver is set in vibration by the employment of undulatory currents of electricity, substantially as set forth," reference being had to my understanding of what is recited in that claim with regard to the state of the art, as I have already explained. A receiver in a system of telegraphy set in vibration by the employment of undulatory currents of electricity fairly, I think, includes a receiver in which an armature is set in motion by an attraction varying in intensity. The second sentence in the claim of Bell's patent of January 30th, 1877, amounts to a sort of explanation; for Professor Bell therein says, "Hence I claim the production of any given sound or sounds from the armature of the receiving instrument by subjecting said armature to an attraction varying in intensity in such manner as to throw the armature into that form of vibration that characterizes the given sound or sounds." The sum and substance of all this, it seems to me, is that Professor Bell, having restated substantially what he had claimed in his preceding patent, now claims for it the production of any given sound, which includes articulate speech. In this respect he seems to be at variance with Professor Cross again, for the latter witness substantially says that the apparatus described in the older patent would do all that Professor Bell now claims in the second part of the claim above quoted. If that is true, then Professor Bell is merely claiming here what he has already patented. If it is not true, then Professor Bell is now for the first time making an original claim for subject-matter not in the first patent. If the claim is to be understood as referring to the specific apparatus in the specification of January 30th, 1877, then I can find nothing in either of the patents to indicate to me that this was not the first apparatus patented by Professor Bell as a means or which was in fact an operative means of transmitting articulate speech. I am quite well aware that this answer is taking an argumentative form, and as such is open to criticism, but I have been asked to give my opinions, and the reasons affecting them, and I am giving the reasons in the form that they have presented themselves to my mind.

THE THIRD CLAIM recites the "combination, with an electro-magnet, of a plate of iron or steel, or other material capable of inductive action, which can be thrown into vibration by the movement of surrounding air, or by the attraction of a magnet." It seems to me that all this claim describes is already shown and described in the patent of March 7th, 1876, unless the particular form of plate shown in the patent of January 30th, 1877, be regarded as an essential element of the combination. The vibrating armature, shown in figure 5 of the earlier patent, which is made of material capable of inductive action, is a thin plate, and is in combination with an electro-magnet, and the specification clearly states that it may be set in motion by the wind, which is a movement of the surrounding air, or, when used on the receiver, by the attraction of a magnet.

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THE FOURTH CLAIM recites: "In combination with a plate and electro-magnet, as before claimed, the means herein described, or their machanical equivalents, of adjusting the relative position of the two so that, without touching, they may be set as closely together as possible." And the specification in this connection says that "it is important that the distance of the magnet from the plate should be as little as possible, without, however, being in contact." Now the information which Professor Bell here gives for the first time in a patent is not only of importance, but of very material importance, in the successful operation of a magneto-telephone. In order that any description of a speaking magneto-telephone may be one from which an operative device may be constructed, it must either set forth adjusting contrivances, whereby the distance between magnet and plate can be regulated, so that the user, if need be, can find out by experiment the proper distance between them to obtain the best results in the transmission of speech, or else it must include a drawing, or what would be much less practical, a statement showing or setting forth exactly what is the proper distance between magnet and diaphragm. In his patent of March 7th, 1876, Professor Bell says nothing on this subject. He gives a drawing showing armature and magnet separated normally by a certain distance. The only understanding possible is, that the distance which he shows them to be separated is the distance which he intends them to be separated. And, of course, it follows that when other distances and proportions of parts shown are increased or diminished, this distance must also be increased or diminished in like ratio.

Recess for lunch.

March 9, 1882, 2.30, P. M.

Examination resumed pursuant to adjournment.

Present same counsel.

[*Witness continues.*] But, as I have already shown, an apparatus made in conformity with what Professor Bell states and exhibits in his patent of March, 1876, figure 7, is inoperative as a speaking telephone; and there is no suggestion in that patent which would lead anyone, I think, to vary the distance between the armature and the magnet from the distance there shown, or giving him any notice that there would be any advantage in doing so; and, so far as I am acquainted with the state of the art prior to the date of Bell's patent of 1876, there was nothing there which would enable anyone skilled in it, from his knowledge thereof, to alter the distance between magnet and armature from that which Professor Bell shows, with the idea of achieving the result of transmitting articulate speech. I don't know of anything being made public in a patent, even in the interval between the issue of the two Bell patents under consideration, which would lead a person who had made the apparatus shown in figure 7, of the patent of 1876, and finding it to be an inoperative one, as I did, to alter its construction or to combine with it any apparatus for adjusting this distance. And in short, Professor Bell seems to have practically kept this very important information, bearing upon the subject of making an operative speaking telephone, from the world, until his patent of January 30th, 1877, referred to before.

THE FIFTH, SIXTH, SEVENTH and EIGHTH CLAIMS of Bell's patent of January 30th, 1877, I understand to relate to combinations in the specific apparatus set forth. In "Defendant's Exhibit Wheatstone Telegraph" there is clearly shown a magnet with a coil upon the end nearest the armature, and also a permanent magnet so arranged substantially as recited in the fifth and eighth claims. And if the first three claims of the patent of 1876 relate, as Professor Cross seems to think, to a system of electric telephony, the old Wheatstone apparatus contains these elements under like condition, though not in the specific system of electric telephony particularly set forth in Bell's second patent and referred to in the fifth and eighth claims.

THE SIXTH and SEVENTH CLAIMS of Bell's patent of January 30th, 1877, relate to the sounding-box and the speaking-tube, both of which devices, in almost identically the same form and for the same purpose, were used in the Reis telephone, and are represented clearly in the engravings published in the issue of the *Manufacturer and Builder* referred to, in 1869. Generally, therefore, so far as the subject-matter of the fifth, sixth, seventh and eighth claims of Bell's patent of January 30th, 1877, is concerned, I think Mr. Bell simply recites a combination of old devices in and with the operative telephonic contrivance which he describes.

Q. 21. In your several answers above, you have spoken of the state of the art at the date of Bell's patent of March 7th, 1876, and at the date of his patent of January 30th, 1877. In so referring to the state of the art have you taken into consideration anything that had been done by Mr. Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pennsylvania, or have you, on the other hand, made your answers without reference to what Mr. Drawbaugh had done?

A. I have not taken into consideration anything done by Mr. Drawbaugh. I understood the questions to limit me to what I knew of the state of the art at the time of the dates of Bell's patents of March 7th, 1876, and January 30th, 1877, and the only substantial departure that I have made from this is in considering "Defendant's Exhibit Wheatstone Telegraph," which, as I before stated, was brought to my notice at quite a recent date.

Q. 22. Without taking into consideration anything done by Mr. Drawbaugh, will you briefly summarize in one answer what you understand from Mr. Bell's two patents aforesaid, to have been the improvement, or advance in the art, contained in the invention patented March 7th, 1876; and also what you understand to have been the further improvement, or advance in the art contained in the invention patented January 30th, 1877, and in the same answer please state how your present opinion of the first named invention of Mr. Bell, as derived from careful examination of his patent of March 7th, 1876, compares with the understanding which you say you had of that invention, when it was first communicated to the public in 1876?

A. In his patent of March 7th, 1876, I understand that Mr. Bell takes the old undulatory current, well known in telegraphic systems, and produced therein in substantially the same way as he produces it, and applies it to a telephonic system, whereby the signals transmitted are received by sound. Before him, the signals transmitted by the undulatory current had been received in apparatus, the indications of which were addressed primarily to the eye, though secondarily they have also been received by sound; through, for example strokes on a bell. There had arisen, however, what might be considered, perhaps, a new art, in the transmissions of the normal vibrations of a body, so as to affect and set in vibration another body tuned in unison therewith, through the medium of an intermittent, or "make-and-break" electric current. Substantially, to what was known in this new art Professor Bell applied what I have already pointed out as existing in the old art, and the result of this union was an advance in the new art, in the shape of the invention of a telephonic system, whereby both pitch and loudness of sound would be transmitted, and this either in single or multiple form. That was the advance made in the first patent. In the second patent of January 30th, 1877, he makes two advances: the first being the transmission simultaneously of two or more musical notes, or signals along a single wire and with a single battery, without the use of as many instruments as there are musical notes, or signals to be transmitted; and second, and what was infinitely more important to the world, he takes the elements of the harmonic musical telephone, which he had previously invented, and adds to them other things—other instrumentalities, some old and some new—and as a result then, and only then, achieves the production of a telephone competent to transmit articulate speech. This sums up the advance made in the second patent. Now, as regards the second part of the question, as to my impression at, or about, the time Bell's patent of March 7th, 1876, was issued, and in fact for some months afterwards, I think I have already stated somewhere in my testimony, that I supposed it to be simply a harmonic musical telephone. Although it may not be proper for me to say so, I think this was the general impression among those who controlled the editorial columns of the *Scientific American*; and at all events it is certain, that if I had supposed Mr. Bell's invention and his patent of March 7th, 1876, did then embody the extraordinary advance Professor Cross says it did, then I should have regarded it as my duty, if I had seen that the proprietors of the *Scientific American* did not so understand it, to have urged the scientific importance of the matter upon them, or taken other means looking to its early and full publication in the paper. As it was, I think no detailed reference to the subject was made in the paper until the following September (1876), and when this article did appear it was headed with a reference to, and the instrument described was compared with, a string-telephone, or thread-telegraph as it was called, published in the interval, on May 27th, 1876. This article was not published in a prominent part of the paper, and on looking it over now, my impression is that it was derived, in substance, from another journal.

Q. 23. In his patent of January 30th, 1877, Professor Bell states in effect, that he had invented also an improvement consisting substantially in means for dispensing with the necessity for a voltaic battery in this class of instruments. I observe that in your last answer you did not refer to this last statement; why not?

A. I omitted reference to that point advisedly, because Professor Bell got, or could easily have got, the idea of doing away with the battery from the state of the art of telegraphy, as known before the date of his patent of January 30th, 1877. In "Defendant's Exhibit Wheat-

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stone Telegraph" is shown clearly the method of obtaining magneto-electric undulatory currents in a system of telegraphy, without the use of a battery, and with the use of permanent magnets; and the description in that exhibit expressly points out that this substitution is made. It will be noticed further, on comparing figure 1, of the drawings attached to "Defendant's Exhibit Wheatstone Telegraph," with the drawing, figure 5, of Bell's patent of January 30th, 1877, that the devices respectively shown therein, so far as magnet, coils and cores, and armature are concerned, is substantially and almost exactly the same; and the use of the magnet in the one case, so far as the production of an undulatory current is involved, serves the same purpose as in the other. The substitution of the magnet for the battery, therefore, I meant to include in my previous answer among the old ideas of which Mr. Bell availed himself in getting up the device shown in his patent of January 30th, 1877.

Q. 24. You have observed that Professor Wheatstone, in the exhibit to which you have referred, arranges the permanent magnet and the electro-magnets at right angles to each other, whereas Professor Bell arranges them in the same plane; what difference, if any, does this make?

A. None, I think, that is material; numerous working speaking telephones have since been made with the coils arranged at right angles to, and also as prolongations of, the permanent magnet, the instruments operating well, so far as I know, in either way.

Q. 25. Please compare the telephone transmitter patented by F. A. Klemm, December 21st, 1880, No. 235,635, which patent is for one of the alleged infringing instruments, with the two patents of Professor Bell, here in suit, and state whether or not you agree with Professor Cross, on the infringement questions involved in the use of said Klemm battery transmitter, giving your reasons for any opinion you may express.

[*Counsel for Complainants calls attention to the fact that the two instruments put in evidence as infringing instruments, were called, on page* 20 *of Complainant's record, the one " Complainant's Exhibit Klemm Battery Telephone," being a battery transmitter of the form and character shown in the drawing and description of the Klemm patent* 235,635, *printed on page* 83 *of the Complainant's record; and the other " Complainant's Exhibit Tisdel Magneto Telephone," being an instrument the same in general* *principle as that shown in the Tisdel patent* 227,861, *page* 84, *of Complainant's printed record, but differing somewhat from the one there figured, in the form of some of the parts, said differences not being material to this case as he understands. He also states that in questions* 20 *and* 24, *pages* 40 *and* 42 *of Complainant's case, the word* "*Klemm*" *there found should be* "*Tisdel,*" *the instrument referred to in said questions and answers thereto being the Tisdel Magneto Telephone.*]

Adjourned until March 10th, 1882, 10:30 A. M.

March 10th, 1882, 10:30, A. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Examination of Mr. Park Benjamin by Mr. Hill continued.

A. I agree with Professor Cross in finding in the battery transmitter an instrument which, when operated by the voice, will produce electrical undulations in the current traversing the circuit similar in form to the air waves by which these electrical variations are produced ; also with his statement that it operates by varying the resistance of the circuit. The means through which this result is chiefly attained consist of a metal diaphragm supported on a spring-arm, in contact with which there is held a carbon contact-piece supported by another spring-arm. The diaphragm is set in vibration by the voice, and thereby the pressure between said contact-piece and a point on the diaphragm is varied, thus producing changes in the resistance in an electrical circuit passing through said diaphragm and contact-piece.

While, as I have already stated, it was known theoretically, from Ohm's law, as recited by Professor Cross in his answer to the 13th interrogatory in Complainant's *prima facie* case, that the strength of a current could be varied by increasing or diminishing the resistance, and this long before the date of Bell's patent of March, 1876, still, so far as I am aware, no apparatus for producing undulatory currents by this means, especially in a telephonic system, had been devised or come into use. I understand from Professor Cross' testimony that he considers that Mr. Bell in his patent of March 7th, 1876, first indicates such an apparatus as embodying one of the methods devised by him as suitable for the production of electrical undulations similar in form to the air waves produced by the voice. Professor Cross also undertakes to show, in his answer to the 19th interrogatory in his testimony in Complainant's *prima facie* case, by various references to prior French publications, that it was "known long before the date of Mr. Bell's patent that the resistance of a circuit is varied, without being broken, by variations in the intimacy of contact, or amount of pressure between two electrodes in contact, from one to the other of which a current is passing." He describes, however, no specific construction of apparatus depending upon this principle for its operation, but, as I understand him, says generally that the fact was "constantly acted upon in the practical use of electrical apparatus; care was always taken that contact should be firm and with considerable pressure, for otherwise the full and desired strength of current was not obtained."

In view of this acknowledgment as to the state of the art by Professor Cross, indicating the principle to have been known, it seems to me all the more necessary for Professor Bell, if he intended to apply that principle to a telephonic apparatus, to specifically describe his means for doing so; otherwise, according to Professor Cross' own admission, it is scarcely possible to see how he has made any invention or discovery in this direction at all.

But I have already pointed out in a preceding answer, in considering Professor Bell's patent of March 7th, 1876, that he wholly fails to give therein any information from which an operative apparatus of the kind could be constructed.

Professor Cross admits, page 37, that "the precise method adopted in the Klemm transmitter for varying the resistance of the circuit is different from the particular method referred to by Mr. Bell, inasmuch as it utilizes the property of variation in resistance with variation in pressure possessed by various substances." I infer from this, that Professor Cross must attach some meaning to the words "particular method" different from the general run of humanity; because the nearest approach which Mr. Bell makes to particularity in this connection is found in the following sentence: "For instance, let mercury or some other liquid form part of a voltaic circuit, then the more deeply the conducting wire is immersed in the mercury or other liquid, the less resistance does the liquid offer to the passage of the current; hence the vibration of the conducting wire in mercury or other liquid included in the circuit occasions undulations in the current." Certainly, I think, these words do not describe a "particular method" and the specific construction and means whereby it can be carried out, and, unless Professor Cross intends the term "precise method" to mean one thing and "particular method" to mean another, in the sentence I have quoted from his testimony, I fail to see how he can regard as comparable the specific and detailed statements of the Klemm patent, and the vague suggestion made by Professor Bell, as before quoted.

But apart from all this, even after making this comparison, he says the two methods differ; so that if the meaning of his testimony is that he finds in the Klemm transmitter substantially the same elements operating in like manner to produce a like result, as recited in Bell's patent of March 7th, 1876, then I fail to see how he determines this other than by a comparison between the detailed statements of the Klemm patent and Professor Bell's bald statement that electrical undulations may be produced by varying the resistance of the circuit. So that all the conclusion I can derive from his testimony on this point is, substantially, that the Klemm transmitter contains a principle set forth in Bell's patent, but its method of apylying this principle of varying resistance is different from even the mere hint of a method that Professor Bell gives, and that he is able, virtually, to swear that Klemm infringes Bell by comparing what is fully described in Klemm's patent with Bell's statement, that by alternately increasing and diminishing the resistance of a circuit you can produce electrical undulations therein

In comparing the Klemm transmitter with what is set forth in Bell's patent of January 30th, 1877, the substance of Professor Cross' testimony appears to be simply that he finds in the Klemm battery transmitter that the diaphragm is protected from the action of extraneous sounds by a box substantially like that described in the Bell patent, and also that he finds in the Klemm transmitter the reduced orifice which admits sound waves to the plate directly at its centre, and the reduced space in front of the plate, as shown in Bell's patent aforesaid. I don't find any reference to these features in the specification. They are shown in the drawings; that is to say, in the drawings attached to the patent, the diaphragm appears to be protected from extraneous sounds by a box, and there is a narrow space between the end of the speaking tube and the diaphragm, which I presume to be the reduced space referred to.

THE SIXTH CLAIM of the patent simply recites: "The combination with an electric telephone such as described of a sounding-box, substantially as herein shown and set forth."

So far as the essential construction and operation of the Klemm transmitter is concerned, by varying the resistance of the circuit, Mr. Bell makes no reference to an instrument of that kind specifically in the second patent of January 30th, 1877, and I do not understand Professor Cross to say that he does.

Q. 26. Have you examined the various instruments put in evidence by the Defendants in this cause as the inventions of Daniel Drawbaugh, of Eberly's Mills, Pennsylvania, and do you understand their construction and mode of operation?

A. I have carefully examined the instruments named in the question, and believe I understand their construction and operation.

Q. 27. Have you tested the practical operation of any of them, by actually working them on a voltaic or magneto-electric circuit, or circuits?

A. I have.

Q. 28. Have you heard or read Mr. Drawbaugh's testimony in this cause relative to said instruments, his mode of working them, and the modifications of some of the earlier ones to which he refers?

A. I heard Mr. Drawbaugh give nearly the whole of his testimony; all, I think, that bears directly upon the instruments themselves.

Q. 29. Assuming Professor Cross' opinions as to the patents of Alexander Graham Bell and the inventions therein contained to be correct, will you please compare the Drawbaugh instruments here in evidence, marked "F" and "B," with the two Bell patents on which this suit is founded, referring, if you please, to the original and "reproduced" instruments "F" and "B," and to the drawings and photo-lithographs thereof, as you find them here in evidence, and to Mr. Drawbaugh's description of said instruments and their modifications, which you will find in his deposition in this cause; and state whether or not, and, if yes, to what extent, you find those instruments, or either of them, to contain the same invention as said Bell patents, or either of them, giving your reasons, so far as you may think necessary, for any opinions you may express, and referring to any tests which you may have made?

Recess for lunch.

March 10*th*, 1882, 2 P. M.

Examination resumed pursuant to adjournment.

Present, Mr. Storrow for Complainants, and Mr. Hill for Respondents.

Examination of Mr. Park Benjamin by Mr. Hill continued.

Ans. I understand that in answering this question I am to adopt fully and completely, and assume to be correct, without regard to opinions I have hitherto expressed, the statements which Professor Cross makes as to what he finds set forth in the patents of Professor Bell in suit. In view of the full descriptions which have already been given of Mr. Drawbaugh's instruments "B" and "F," by Mr. Drawbaugh himself and Mr. Knight, in their testimony in this case, which descriptions I have read and believed to be correct, I do not think it necessary for me in the present connection to repeat the same, so that I shall pass at once to the comparison called for between the two instruments and what Professor Cross finds set forth in the Bell patents.

I will first compare the instrument "B," as shown in Defendant's "Exhibit B reproduced drawing," with the instrument shown in figure 7, and described in the specification of Bell's patent of March 7th, 1876.

In figure 7 there is shown an electro-magnet the coil of which may be connected with a voltaic circuit. In Defendant's "Exhibit B" there is an electro-magnet the coils of which may be connected with a voltaic circuit. In front of the pole of the electro-magnet in Bell's device, figure 7, is arranged an armature of inductive material, by the vibration of which undulatory currents may be induced in the coils of the electro-magnet. In Defendant's "Exhibit B" there is arranged before the poles of the electro-magnet an armature, by the vibration of which undulatory currents may be induced in the coils of the electro-magnet. In both the instrument "B" and Bell's instrument the armature is connected to a membrane, in such manner as to receive and be governed by the movements of that membrane. In both instrument "B" and Bell's device, the membrane is stretched across the end of a tube, the purpose of which in both cases is to receive and concentrate sound made into it upon said membrane. In the instrument "B" the armature is secured directly to the membrane, and facing the poles of the electro-magnet. In Bell's device, figure 7, the armature is hinged to one leg of the magnet and hangs down in front of the pole, and is connected to the membrane by a stud. For purposes of this comparison, I regard this difference in mode of connection as immaterial, though as a matter of fact, for practical purposes, I consider the method shown in instrument "B" as the better one. There is shown in Defendant's "Exhibit B" a tension-spring for tightening the diaphragm, which is not shown in Bell's figure 7, but the spring is merely additional, and does not alter in principle the construction and operation of the device. I have now found in Defendant's instrument "B" all the essential elements set forth in the two similar instruments exhibited connected by a closed voltaic circuit, in figure 7 of Bell's patent of March 7th, 1876; and I also consider, that if two instruments "B" were connected in a like manner by a closed voltaic circuit, then the said instruments "B," being substantially the same in construction, would be the same in arrangement in the circuit, and hence would operate in substantially the same way to produce the same results, namely, the transmission of articulate speech, as asserted by Professor Cross in reference to figure 7 of Bell's patent of March 7th, 1876. From the testimony which has been given in this case on the part of the Defendants, I learn that Defendant's instrument "B" was intended for and used as a receiver; and I further find by comparing the essential elements existing in said instrument "B," with what is shown and set forth in the receiver in figure 7 of Bell's patent of March 7th, 1876, that an undulatory current passing into the electro-magnet of said instrument "B" would influence the armature attached to the membrane, and cause it to vibrate correspondingly—this in the same manner, and producing the same result as the electro-magnet in the receiver in Bell's apparatus in figure 7 influences and causes to vibrate the armature combined with it. If, then, the receiver in Bell's device is competent to reproduce articulate speech, Defendant's instrument "B" is equally competent to do the same thing, both being operated in the same manner by the undulatory current.

In order to discover whether Defendant's instrument "B" would actually reproduce articulate speech, I tested the "reproduced" instrument "B" on a closed voltaic circuit. As I shall have other tests to describe in future answers, it seems proper at the outset to take occasion here to describe the conditions under which these tests were made, and also the general manner of making them.

A line-wire was run from the small corner room of the upper story of Mr. Drawbaugh's shop, at Eberly's Mills, through and across the building, then out of a window and into a room in an out-house adjoining, twenty-five or thirty feet distant from the shop. The distance from end to end of the circuit was some sixty or seventy feet. I used the room in the shed as a receiving station chiefly, and when the door of that room was shut it was wholly impossible to hear any sound whatever coming through the air from the upper story of the shop. In all cases hereafter mentioned I took the same precautions, which I have already mentioned in a previous answer, against an instrument being taken off the line and another substituted without my knowledge, while I was at the other end of the circuit, in the way of twisting the connections together in a particular manner known only to myself. I also took the further precaution of stationing a reliable man, whom I am informed is in no wise interested in this cause, to watch the instruments after I had attached them, during my absence. The person I refer to is Mr. Heiges, who has already testified in relation to this subject. I think I may say that I omitted no precaution that I could think of to make these tests absolutely fair, and to prevent any possible improper tampering with the instruments while they were under my control. Instrument "B" was tested first on the circuit described; this was on December 1st, 1881; and again on the same circuit on which the Bell instruments that I had made were tested, as described in my previous answer, on December 14th, 1881. In both cases the "reproduced" instrument "B" was used, as a receiver, the circuit being closed through a battery and carbon transmitter. I listened at the instrument "B," after personally examining the circuit, and testing it to be sure that it was in good working order, by means of the two Tisdel speaking telephones, as already described in a previous answer; I also attached the instrument "B" and the transmitter. Under these conditions I heard speech through the instrument "B," so as to distinguish what was said by the person at the other end of the line, who talked into the transmitter. I had various kinds of noises made into the transmitter, including music from a musical-box, ticking of a clock, and counting and repetition of sentences by the human voice; and I found no difficulty in recognizing the different qualities of these sounds.

As regards the instrument "F," this is constructed on the principle of using the undulating current by varying the resistance of the circuit, and hence belongs to the same class of instruments as the Klemm transmitter, one of the alleged infringing devices in this case. For reasons I have already given it is not possible for me to go into any detailed comparison between this contrivance and what is set forth in Bell's patent of March 7th, 1876. I can only compare it with what Professor Cross says he finds claimed in and substantially covered by that patent, namely: any apparatus for producing an undulatory current in a telephonic system through varying the resistance of the circuit. Defendant's instrument "F" is such an instrument. Speech or sounds uttered in front of the diaphragm cause the same to vibrate and transmit its movements by a rigid connection to a metallic plate resting upon powdered carbon, held in a suitable cup. A circuit is made through the diaphragm and carbon, and the vibrations of the diaphragm cause the carbon to be subjected to varying degrees of pressure, which vary the resistance of the material to the passage of the current, so rendering the latter undulatory. I understand, that this instrument was intended and made for a transmitter, and of course its form renders it unsuitable for use otherwise. In this respect it is analogous to the Klemm transmitter, and it operates on the same principle to produce like results. I tested this instrument in its reproduced form ("Defendant's Exhibit reproduced" "F") in both of the circuits previously described, on November 30th and December 14th, 1881, using a magneto instrument as a receiver. I found no difficulty in hearing spoken words under these conditions. The battery current, both in this and the preceding test, was obtained from a Leclanché cell in the circuit. The magneto instruments which I used as receivers, and through which I heard speech, were Defendant's "reproduced" "B," already referred to in this answer, and Defendant's original instrument "A." Although under these conditions the sounds received through the "reproduced" instrument "B" were readily recognized and distinguished by me, those received through the original instrument "A" were louder and clearer.

Q. 30. Please answer the same question with the words "C" and "I" substituted for "F" and "B;" that is to say, make the same comparison between the Drawbaugh instruments "C" and "I," and the Bell patents aforesaid.

Ans. The construction of these instruments, I believe, has been fully described by Mr. Drawbaugh and Mr. Knight in their testimony in this case. In instrument "C" (and for the purpose of this comparison I refer more particularly to Defendant's "Exhibit C reproduced," and also Defendant's "Exhibit reproduced C drawing,") I find contained all the essential elements set forth in Bell's patent of March 7th, 1876, as interpreted by Professor Cross, capable of operating in like manner to produce the same results; this for the following reasons:

In both Bell's device, as more particularly shown in figure 7, of the patent referred to, and Defendant's exhibit "reproduced" instrument

"C" I find an electro-magnet having arranged in front of its pole an armature which, when set in vibration, will cause undulatory currents of electricity in the coil of said magnet, which currents will pass into a circuit wire, if the same be suitably connected with said coil, and will affect the magnet, and, hence, the armature of a similar instrument connected in said circuit, so that the second armature may reproduce the vibrations of the first.

I also find in both Bell's device, in figure 7 of his patent of March 7th, 1876, and in Defendant's exhibit "C reproduced," a tube for concentrating the sound-waves upon the armature. I find further, that, although Defendant's "reproduced" instrument "C" was not intended for working with a battery in circuit, still it may be so worked and two instruments "C" may be joined, and arranged in circuit with a battery, as are the instruments shown in Bell's patent of March 7th, 1876. The two instruments "C," when thus arranged, would, in my opinion, operate in like manner to produce the same result as Professor Cross considers true of the apparatus shown in figure 7 of Bell's patent of March 7th, 1876.

I find also in Defendant's exhibit "C reproduced" many of the most essential features embodied and described in Bell's patent of January 30th, 1877, for the reason that said instrument "C" contains an electro-magnet combined in substantially the same way and for the same purpose, with a plate of iron or other material capable of inductive action, which can be thrown into vibration by the movement of the surrounding air, or by the attraction of a magnet. There is attached to this plate an armature of like material, and in the original instrument "C" I understand the plate to be of German silver, and the armature of iron. I do not regard these differences as material, as between the two instruments "C," original and "reproduced," nor do I regard the presence of the armature as material, as affecting the comparison already made between Defendant's instrument "C" and the subject-matter of the third claim of Bell's patent of January 30th, 1877. The magnet in Defendant's Exhibit instrument "reproduced" "C" serves the same purpose and accomplishes the same results chiefly in obviating the use of a battery in the circuit, as does the permanent magnet shown in Bell's device of January 30th, 1877.

I tested Defendant's instrument "C reproduced" on the circuit between Mr. Drawbaugh's shop and shed, on November 30th, 1881. No battery was joined with the circuit, and the wires were connected by me to "reproduced" instrument "C" at one end and another magneto-telephone at the other. I tested instrument "reproduced" "C" both as atransmitter and receiver, and in both cases heard speech through the line distinctly. I found it to be especially good as a transmitter, and I noted that the sounds received by me while listening at "C" were not so loud or distinct as those which I heard while listening at the telephone at the other end of the line, the instrument "reproduced" "C" being used as a transmitter.

Adjourned until March 11th, 1882, at half-past ten, A. M.

March 11th, 1882, 10.30, A. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Examination of Mr. Park Benjamin by Mr. Hill continued.

[*Witness resumes answer.*] Comparing now Defendant's exhibit "reproduced" instrument "I" and Defendant's "Exhibit reproduced I drawing" with what Professor Cross finds shown and described in Bell's patent of March 7th, 1876, I find both in said "reproduced" instrument "I" and in the apparatus shown in Bell's patent substantially the same essential elements operating in like manner to produce the same result, for the following reasons:

In both devices there is an electro-magnet before the pole of which is arranged an armature, through the vibrations of which undulatory currents may be induced in the coils of said magnets, and which armature may also be set in vibration by undulatory currents, when the same are passed through said coils. In both devices the armature is attached to and its movements may be governed and controlled by vibrations imparted to a diaphragm extended across the end of a tube, which tube serves in both devices as a means of concentrating the sound upon the diaphragm. Although so constructed as to be capable of being used without a battery, two instruments "I," of like construction, may be joined and will operate in a closed voltaic circuit to produce the same results as Professor Cross states may be produced by the two instruments represented in figure 7 of Bell's patent of March, 1876, when said instruments are connected in a closed voltaic circuit, as shown. I also find in Defendant's "Exhibit reproduced I drawing," many of the essential elements set forth in Bell's patent of January 30th, 1877, operating to produce a like result in substantially the same way, for the following reasons:

Both the apparatus described in said patent and Defendant's Exhibit "reproduced" "I" instrument contain an electro-magnet combined with a plate of material capable of inductive action, which can be thrown into vibration by the movement of the surrounding air, or by the attraction of a magnet. Both instruments are electric telephones, in which is arranged a magnet with a coil upon the end of the magnet nearest the plate. Both instruments are provided with a sounding-box, in which the diaphragm is inclosed and which protects said diaphragm from being affected by extraneous vibration, and in both there is a comparatively reduced space in front of the diaphragm and a central small opening in the mouth-piece; and in both instruments there exists the combination of a permanent magnet with a plate of material capable of inductive action, with coils upon the end of said magnet nearest the plate; the presence of the magnet in both cases enables the instruments to be used without a battery. I also find both in Defendant's "reproduced" instrument "I" and in Bell's device as set forth in his patent of January, 1877, when either of said devices are united upon an electric circuit in the form of receiving or transmitting instruments, any given motion may be produced in the armature of each receiving instrument by subjecting each armature to an attraction varying in intensity, substantially as set forth in the second claim of Bell's patent of January 30th, 1877. I have tested Defendant's Exhibit "reproduced" "I" under the same conditions, and in the same place as already referred to in previous descriptions of tests, on November 30th, 1881.

Defendant's Exhibit "reproduced" instrument "C" was attached to one end of the line, and Defendant's "Exhibit I reproduced" instrument to the other by me, no battery being used in the circuit. I listened at instrument "I" and clearly heard speech passing through the line. I also listened at the instrument at the other end of the line, and there I heard speech uttered into instrument "I."

Q. 31. In the same manner please compare said two Bell patents with Drawbaugh's instrument here in evidence, marked "A."

A. This instrument has also been fully described by Mr. Drawbaugh and Mr. Knight, in their testimony in this case. In comparing Defendant's Exhibit instrument "A," with what Professor Cross states is shown and set forth in Bell's patent of March 7th, 1876, I find in both devices substantially the same essential elements, operating in like manner to produce the same results, for the following reasons: In both devices there is an electro-magnet, before the pole of which is arranged an armature of inductive material, by the vibrations of which undulatory currents may be induced in the coils of the electro-magnet, or which may be caused to vibrate by undulatory currents passing into said coils; and I understand that the said instrument "A," was originally intended to be used as a receiver in a telephonic circuit with a battery; and I find that when so used it will operate in substantially the same way, to produce a like result as the device shown at L, in figure 7, of Bell's patent of March 7th, 1876 In both devices the armature is connected to a diaphragm, and communicates thereto the motion caused by the influence of the magnet upon it; and in both instruments there is a compartment in front of the diaphragm for concentrating the sounds emitted thereby upon the ear.

I also find in Defendant's Exhibit instrument "A," a sounding-box inclosing the diaphragm and protecting the same from extraneous vibrations, and so arranged that a much reduced space is formed in front of said diaphragm; and there is also a hearing-tube for conveying the sounds from the telephone; all substantially as set forth in Bell's patent of January 30th, 1877. I also find in Defendant's "Exhibit A," in combination with the armature and electro-magnet, specific means for adjusting the relative position of the two, so that without touching they may be set as closely together as possible; substantially as recited in Bell's patent of January 30th, 1877.

I tested this instrument "A," at the same place, and under the same general conditions, as set forth in my descriptions of previous tests, on November 29th, and November 30th, 1881. I used the instrument as a receiver, attaching a carbon transmitter to the other end of the line, and connecting a battery in the circuit. In one of the tests the carbon transmitter used was Defendant's Exhibit "reproduced" "F." I listened at instrument "A," and heard speech passing through the line clearly and distinctly. I caused several persons to speak into the transmitter, and found no difficulty, not only in hearing what they said, but in recognizing the persons speaking by their voices

Perhaps it may be proper for me to state here that this instrument "A" was the first one given to me to test of any of Mr. Drawbaugh's instruments. I had never seen any of these instruments before the day these tests were begun, and I knew nothing whatever as to their capability, except what had been told me. I looked, of course, at the construction of instrument "A" before connecting it to the line, and recognized at once its similarity to Mr. Bell's alleged invention, about as I have indicated. I had quite a clear recollection, and have now, of the results which I obtained from the two early Bell magneto-telephones, which I tested in 1877, I think, as I have described in a previous answer; so that I could form some idea of the relative efficiency of this instrument "A" of Mr. Drawbaugh's and that of Mr. Bell's instrument by a mental comparison. In my opinion the speech that I received through Drawbaugh's instrument "A" was considerably louder and clearer than any which I had heard through Bell's old telephone. I understood, then, that the instrument "A" had been constructed nearly eight years ago, and I naturally inferred from this fact that age and wear might have caused some deterioration in its condition, which would reduce its efficiency; and this, perhaps, accounts for the surprise which I felt on hearing speech so clearly and distinctly delivered by it, especially in comparison to what I had heard from the Bell instruments before referred to, which appeared to be quite new at the time I used them.

Q. 32. Were Bell instruments, which you tested in 1877, constructed in accordance with his patent of March 7th, 1876, or with that of January 30th, 1877?

A. They were not constructed in accordance with his patent of March 7th, 1876, but were constructed in substantial accordance with his patent of January 30th, 1877, with some modifications in form; that is, they were not box instruments, as shown in said patent, but were of the so-called "butter-stamp" form, like the Bell magneto-instruments now in common use.

Q. 33. From your knowledge of the construction and working of Drawbaugh's instrument "A," which you tested as described, and from your knowledge of the two Bell patents herein above referred to, and of the practical operation of electric speaking telephones in general, assume a voltaic circuit such as described in Bell's patent of March 7th, 1876, with one of Drawbaugh's instruments "A" substituted in the line in place of the transmitter shown in figure 7 of the Bell patent of March 7th, 1876; and another instrument exactly the same as "A" substituted in the line in place of the receiver shown in said figure 7; and then state how the line thus equipped would, in your judgment, compare with the line and its equipments shown in said figure 7.

A. I have already pointed out and demonstrated, I think, by actual test that the apparatus shown by Professor Bell, in figure 7 of his patent of March 7th, 1876, is inoperative for the transmission of articulate speech. I have also found in Drawbaugh's instrument "A" all the essential elements set forth and shown in the apparatus set forth and shown in said figure 7; and, assuming Professor Cross' statements with regard to that apparatus to be correct, it follows that if said apparatus is operative, then two of Drawbaugh's instruments "A" connected in closed circuit with a battery in the same way would also be an operative speaking telephonic device. But throwing aside this assumption and comparing two of Drawbaugh's instruments "A" connected in closed circuit with a battery with actually what is shown in said figure 7, I find that Drawbaugh's instruments thus arranged would constitute an operative system for transmitting articulate speech, although Bell's device would not, chiefly for the reason that there are embodied and present in Drawbaugh's instruments "A" important improvements wholly absent from the device shown by Bell in his patent of March, 1876, figure 7, and not described by Bell in a patent until in the one which he obtained January 30th, 1877. Of these improvements, as I have already pointed out, the most important is the means for adjusting diaphragm and armature with relation to each other as closely together as possible without touching, as Bell describes in the fourth claim of his patent of January 30th, 1877. In Drawbaugh's instrument "A" two devices for this purpose are provided, whereby this adjustment may be effected with great nicety, there being not only an adjusting-screw, marked *G*, in Defendant's "Exhibit A drawing," for bringing the electro-magnet closer to or farther from the diaphragm, but also a second adjusting-screw, marked *B*, in said drawing, by which the diaphragm may be adjusted closer to or farther from the pole of the magnet. In testing this instrument "A" I used these screws for effecting the adjustment, and found them to serve the purposes described excellently well.

Q. 34. In testing the instrument "A," if I understand you correctly, you did not use a reproduction of the instrument, but used the original instrument itself, which is here in evidence; am I right?

A. Yes, sir.

Q. 35. Assume a closed voltaic circuit, such as is shown in figure 7 of Bell's patent of March 7th, 1876, and in place of the transmitter and receiver shown in said figure 7, assume that two of Drawbaugh's instruments similar to Defendant's Exhibit "reproduced" "B," are substituted; then please compare the line thus equipped with the invention of Bell shown in figure 7 of his patent of March 7th, 1876, and with the invention shown in his patent of January 30th, 1877.

A. In one of my answers hitherto given, with regard to the construction that I found set forth in figure 7 of Bell's patent of March, 1876, I pointed out that not only was there no means shown nor suggested whereby the distance between magnet and armature could be varied, and not even a hint that it ever would be desirable to change that distance from what was specifically shown in the drawing, but that, as a matter of fact, there was nothing in that drawing which would convey to a person making such device any idea as to how he could alter the said distance even if he wanted to.

Recess for lunch.

March 11, 2.20, P. M.

Examination resumed pursuant to adjournment.

[*Witness continues*:] The drawing, figure 7, does not even show how the uncovered leg of the magnet is to be attached to the cone, and supposing the cone to be made of pasteboard, as it might be, I doubt if the iron magnet could be attached thereto by a screw, or rivet for example, and the parts remain in firm connection if the instrument was subjected to much handling or wear; neither do I see what efficient means could be adopted in the apparatus shown in figure 7 in the way of an addition thereto, or modification thereof, for enabling the relative adjustment of the magnet and armature to be effected without some change in the organization of the instruments, which would involve independent invention, and which, when Professor Bell did make it, did apparently involve independent invention, as shown by his specification to the improvement as new and original in his later patent.

In Defendant's exhibits—both original and reproduced instruments—devices for effecting this relative adjustment of magnet and armature are present and through these devices the adjustment may be effected, in substantially the same way as shown in Defendant's exhibit "A" instrument. By loosening the screw marked *G* in Defendant's "*B* drawing," or *f* in Defendant's "Exhibit reproduced B drawing," it then becomes possible to move the electro-magnet upon its supporting piece nearer to or farther from the armature, and then by tightening the said screw it may be secured rigidly in place. Then for making the adjustment still nicer, there is provided in both instruments "B" referred to, a tension-plate, marked *H*, in Defendant's "Exhibit B drawing," and *G* Defendant's Exhibit "B" "reproduced" drawing, one end of which presses against the diaphragm, and by simply moving which plate the diaphragm and the armature attached thereto may be allowed to come nearer to, or be pushed further from the poles of the magnet. Defendant's Exhibit "B" instrument, therefore, contains in good practical working form the adjusting device for regulating the distance between magnet and armature, which is wholly absent in the apparatus shown by Bell in figure 7 of his patent of March 7th, 1876. Therefore, I think that two instruments such as Defendant's "Exhibit B reproduced," if joined in a voltaic circuit, would be operative as a speaking telephone; whereas Bell's device above referred to would not be, and is not.

Q. 36. Please compare the two original Drawbaugh instruments, which are here in evidence, as Defendant's "Exhibit D" and Defendant's "Exhibit E" with Professor Bell's two patents dated March 7th, 1876, and January 30th, 1877, stating your conclusions and reasons therefor, and referring to any tests you may have made.

Ans. Defendant's "Exhibit D" and E" instruments have also been described by Mr. Knight and Mr. Drawbaugh in their testimony in this case. Comparing these instruments with what Professor Cross finds shown and described in figure 7 of Bell's patent of March 7th, 1876, I am of the opinion that the said instruments "D" and "E" contain essentially the same elements existing in said Bell's device, operating in like manner to produce like results, for the following reasons:

In both Bell's device and Defendant's instruments "D" and "E," I find an electro-magnet having arranged in front of its pole an armature, by the vibrations of which undulatory currents may be induced in the coils of said magnet, or which may be vibrated by the influence of said magnet, when undulatory currents are passed through the coils thereof. Although embodying a permanent magnet, and hence being designed for use in a circuit without a battery, two instruments "D," or two instruments "E" may be connected in circuit, or one instrument "D" and one instrument "E" may be connected in the same circuit, and if the apparatus shown in figure 7 of Bell's patent of March 7th, 1876, is as Professor Cross asserts, an operative speaking telephone, then the instruments "D" and "E," for the same reasons as he gives, would be also operative telephones.

I find also in Defendant's instruments "D" and "E" the essential elements of the second, third, fourth, fifth, sixth, seventh and eighth claims of Bell's patent of January 30th, 1877, operating in substantially the same manner to produce a like result, for the following reasons:

When two of said instruments "D" and "E" are united upon an electric circuit as transmitter and receiver, there may be produced in the armature of each receiving instrument any given motion, by subjecting said armature to an attraction varying in intensity, substantially as set forth in the second claim in Bell's patent aforesaid. Said instruments "D" and "E" contain also the combination with an electro-magnet of a plate of iron which can be thrown into vibration by the movement of surrounding air or the attraction of a magnet, as recited in the third claim. They also contain, in combination with the plate and electro-magnet, means of adjusting the relative position of the two, so that, without touching, they may be set as closely together as possible, substantially as recited in the fourth claim. They are electric telephones, and as such embody a magnet with a coil upon the end of the magnet nearest the plate, as recited in the fifth claim. They also show the combination with an electric telephone of a sounding-box, substantially as recited in the sixth claim. The sounding-box is so arranged as to protect the diaphragm from the action of extraneous sounds; also to form a reduced space in front of the plate; also to form a reduced orifice, which admits the sound waves to the plate, directly at its centre; all substantially as described by Professor Cross in his testimony in regard to the sounding-box in Bell's patent of January 30th, 1877, and in his answers to the 24th and 25th interrogatories, in Complainant's *prima facie* case. I regard the mouth-pieces of these instruments "D" and "E" as, substantially, speaking or hearing-tubes for conveying sounds to or from the telephone, and I also find in said instruments "D" and "E" the combination of a permanent magnet with a plate of iron, with a coil upon the end of said magnet nearest the plate; so that the instruments may be used in circuit without a battery, substantially as set forth in the eighth claim. I have not referred to the first claim of Bell's patent of January 30th, 1877, because it does not seem to refer so specifically to a speaking telephone as do the other claims, relating more particularly, as I understand it, to the improvement in multiple harmonic telephony, set forth in the specification. If it be regarded, however, as including speaking telephones, I find that if two instruments "D" and "E" be united in an electric circuit, then motion produced in the armature of one instrument, by sound or otherwise, will be reproduced in the armature of the other instrument in the same circuit, in like manner and form substantially as set forth in said claim.

I have subjected these two instruments, Defendant's "Exhibits, D and E," to repeated tests, at the same place and under the same general conditions that I have mentioned with regard to previous tests, but in connection with each other upon the same circuit, and in connection with other instruments. The instrument "E," has no adjustable plug —this piece, I understand, having been lost or mislaid after the instrument was originally made. In making the tests I put in a plug and adjusting screw, exactly fitting the place provided for them, the said plug and screw being substantially like the corresponding plug and screw marked *c'* and *F*, in Defendant's "Exhibit D drawing," and existing in Defendant's "Exhibit D" instrument. I tested these instruments, "D" and "E," on November 29th and 30th, and December 1st, 1881, in the following manner. I first compared them, in point of efficiency in transmitting speech, with the two Tisdel instruments referred to in a previous answer, which two Tisdel instruments bore quite a close resemblance to them in point of size, compactness and general arrangement. By attaching the two Tisdel instruments at opposite ends of the circuit, and causing speech to be transmitted through them, I determined the continuity of the circuit and obtained an idea of the intensity and distinctness of the sound as they transmitted it. Then I removed the Tisdel instrument at one end of the line, and substituted therefor Defendant's instrument "E," and on listening at this instrument, heard speech through the line, so far as I could judge, nearly, if not quite, as well as through the Tisdel instrument which it replaced. I then caused speech to be uttered into the instrument "E," and listened myself at the Tisdel instrument at the opposite end of the line, and again heard speech clearly through the wire, thus satisfying myself as to the efficiency of the instrument, both as a transmitter and a receiver. I then tested instrument "D," in precisely the same way, using it both as a transmitter and a receiver, and hearing through it speech through the line clearly and distinctly. I then attached instrument "D" to one end of the line and instrument "E" to the other, and I again heard speech through the line on listening at either instrument. I then maintained conversation through the line, recognized different sounds, and also different persons by their voices. Although I made these experiments with every care, and exercising the precautions already described, I repeated them afterwards, in a manner which, I consider, effectually bars out any possibility of an instrument being changed at one end of the line while I was out of sight of it at the other. To this end I caused the circuit to terminate at the out-house, where I stationed myself at one extremity, and just inside the shop window, on the upper floor, at the other. By standing near the door of the out-house, I could distinctly see the farther end of the circuit, and watch the motions of a person there stationed. The line passed through a hole in the window-glass, so that the sash could be kept down, thus cutting off the sound of the voice of the person at that end of the circuit, so that the sound did not pass through the air to my position in the out-house. At the window end of the line I stationed Mr. Heiges, who has already testified in this case, and he took off and applied the several instruments at his end of the line when I shouted to him to do so, holding up wires and instrument so that I could see him put them on and take them off, and keeping them in my sight while he was talking through them. The distance between myself and the window was only about forty feet, so that I could easily recognize instruments by their forms. I should also mention that the out-house was provided with a door, which I kept nearly closed, except when shouting to Mr. Heiges directly, and by this means I was able to cut off still better any sound of his voice which otherwise might reach me through the air. I attached and detached the instruments at my end of the line myself. On repeating the tests, as already described, under these conditions, I obtained the same results already mentioned, namely, good transmission of articulate speech through the line and instruments. I have stated heretofore in this answer, that in my opinion the instruments "D" and "E," would work well with a battery in circuit, the preceding tests with these instruments, it should be understood, being made without a battery of any kind being in the line. I now made another test of instrument "E," this time without the adjustable plug, which I have stated I inserted in the instrument during the preceding tests, being in place, with Defendant's instrument "H," which is a carbon transmitter, at the other end of the circuit, a battery being connected with said circuit. With this arrangement, on listening at instrument "E," I clearly heard speech uttered into instrument "H," through the line. Then I substituted Defendant's instrument "D," in place of instrument "E," transmitter "H" remaining attached, and heard speech through "D," and the line with great clearness.

Q. 37. Mr. Daniel Drawbaugh has testified, in effect, that since originally making the instruments "D" and "E," he has made no change in either of them, except to hollow out a little recess in the case of instrument "D," around the electro-magnet and directly in rear of the diaphragm, and which appears in the drawing of instrument "D," marked "Section on line *x x*," and that the existence or non-existence of this recess effected no difference in the operation of the instrument; what is your opinion in regard to any practical effect of such recess upon the working of the instrument?

Ans. I agree with Mr. Drawbaugh, that the existence or non-existence of that recess has no material effect upon the practical operation of the instrument.

Q. 38. Professor Cross, in his deposition heretofore given in this cause, refers several times to the fact that the helix in the electro magnet of Bell's instrument, patented January 30th, 1877, is wound around the end, or near the pole of the permanent magnet; in Defendant's "Exhibits D," "E," and "reproduced" "C" and "I," the helix wires are not wound around the end of the permanent magnet, but are wound upon cores of inductive material, and separate permanent magnets are employed having their poles in contact with the rear end of said cores; Would this difference of construction make any difference in the operation of the instrument, or not; and give your reasons with your answer?

Ans. Substantially, it would not. By contact with the poles of the permanent magnet the cores themselves become magnets by induction, so that they act virtually as an extension of the permanent magnet itself, the poles of the magnet then being, for practical purposes, the farther ends of the cores. In his patent of January 30th, 1877, Professor Bell indicates no substantial difference between these arrangements, as in one of his drawings, figure 2, he shows the coil directly surrounding the permanent magnet, and near its end; and in another drawing, figure 5, he shows the permanent magnet with pole-pieces in contact with the ends of the magnet, which pole-pieces form coils around which the cores are wound.

Adjourned until Monday, March 13th, 1882, at half-past ten o'clock A. M.

March 13th, 1882, *half-past ten oclock*, A. M.

Examination resumed, pursuant to adjournment.

Present same counsel.

Examination of Mr. Park Benjamin by Mr. Hill continued.

Q. 39. In the same manner, please compare the two Drawbaugh instruments "G" and "O," here in evidence, with the two Bell patents of March 7th, 1876, and January 30th, 1877, and state your conclusions, with your reasons, referring, if you please, to any tests which you may have made. As some of the minor parts of these instruments have been mislaid or lost, you may refer to the deposition of Daniel Drawbaugh, concerning those parts.

Ans. Both of these instruments "G" and "O" are carbon transmitters operating to produce an undulatory current by varying the resistance in the circuit through which the battery current passes. I understand from Mr. Drawbaugh's testimony, to which I have been referred, that the instrument "O" was originally the same in construction as the instrument "G," but afterwards underwent certain modifications in form, which he describes, which modicafitions do not, in any wise affect the principle of operation of the apparatus. I also learn from Mr. Drawbaugh's testimony that in both of the instruments "G" and "O" carbon balls were provided, arranged in series in contact with one another, and touching the carbons shown in the cups *c* and *F*, in Defendant's "Exhibit O drawing;" and also being arranged in series and in contact with the carbon ball *H*, and contact-tip and cup *G*, in Defendant's "Exhibit G drawing." In Defendant's "Exhibit G drawing" these carbon balls are represented, I understand, by dotted lines. I understand further, that when said carbon balls were in place, as stated, in Drawbaugh's instrument "G," the current passed into one of the screw-posts *E*, in Defendant's "Exhibit G drawing," then to one of the contact-plates; through the carbon balls into the other contact-plate, and through the conducting wire to the other of the screw-posts *E*; and I understand further, that when speech was uttered in front of the diaphragm, the latter, being thrown into vibration, compressed the carbon balls together in greater or less degree, so causing changes in the resistance of the circuit, and thus modifying the battery current to render it undulatory. I also understand from Mr. Drawbaugh's testimony that when the carbon balls were in place, as described in instrument "O," the current was led by a wire to the rear carbon-holder, thence passed through the carbon balls to the diaphragm, to which was attached a conducting wire, from which the current was taken through the rest of the circuit. The operation of this instrument "O" I understand to have been the same as I have already described in regard to instrument "G."

For the same reasons that I have already given when speaking of Defendant's instrument "F," I do not find it possible to institute a comparison between these instruments "G" and "O," and any specific apparatus of like character described in either of Bell's patents. Taking Professor Cross' opinion, however, to be correct, that Bell's patent of March 7th, 1876, does properly set forth a speaking telephone depending for its operation upon variations produced in the resistance of the circuit, then I find in Defendant's instruments "G" and "O" devices for accomplishing a like result, constructed and based on a like principle.

I tested Drawbaugh's instruments "G" and "O" at the same place, and under the same general conditions as I made the tests referred to in a previous answer. I connected instrument "O" to one end of the line as a transmitter, a battery being joined in the circuit, and one of the Tisdel magneto instruments, previously mentioned, being connected to the other end of the line as a receiver. On listening at the Tisdel instrument I heard speech through the line with great clearness and distinctness. I then removed the instrument "O" and substituted instrument "G" in its place, and then, on listening at the Tisdel instrument, I heard speech through the line clearly and distinctly. I then took off the Tisdel instrument and attached first, Drawbaugh's instrument "L," and afterwards Drawbaugh's instrument "M," and, on listening at these last mentioned instruments in turn, I found no difficulty in hearing speech through the line. I also used Drawbaugh's instrument "G" as a transmitter with the "reproduced" instrument "B" as a receiver, in one of the tests of the last mentioned instruments already described, when I heard speech through the line on listening at said instrument "B." In making these tests the carbon balls, not shown in Defendant's "G" and "O" drawings, were put into the instruments, and they were thus rendered perfectly operative. I consider both of these instruments "G" and "O" as exceedingly good carbon transmitters. It will be seen that both of these instruments contain elements set forth in Bell's patent of January 30th, 1877, in that they are provided with a sounding box, which protects the diaphragm from extraneous sounds, in which there is a reduced space in front of the diaphragm, and in which there is a reduced orifice arranged at the centre of the diaphragm. They therefore contain the same essential elements that Professor Cross finds to be present in both Bell's patent of January 30th, 1877, and the Klemm carbon transmitter, operating in a similar instrument to produce the same results in the same way.

Q. 40. In the same manner please compare the Drawbaugh instruments "L" and "M" with said two Bell patents, stating your conclusions and reasons, and referring to any tests you may have made.

Ans. The construction of the two instruments "L" and "M," as described by Mr. Drawbaugh in his testimony, is closely similar. In each of them, in the forms shown in Defendant's drawings of "reproduced L and M," is combined in a single apparatus means for varying the current by changes in the electro-motive force, and also means for accomplishing a like result by producing variations in the resistance. Comparing them with Bell's patent of March 7th, 1876, I find in them substantially the same essential elements as Professor Cross finds shown and set forth in figure 7 of said patent, operating to produce a like result in substantially the same way, for the following reasons:

In both Bell's device and Drawbaugh's instruments "L" and "M" is contained an electro-magnet, before the plate of which is arranged an armature, by the vibration of which armature undulatory currents may be caused in the coil of said magnet, or which armature may be thrown into vibration by said magnets when undulatory currents are passed through the coil thereof. In both Bell's device and Drawbaugh's instruments "L" and "M" is provided a tube for concentrating sounds made into it upon a diaphragm, to which diaphragm the armature of the magnet is connected. If, for the reason stated by Professor Cross, the apparatus shown in figure 7 of Bell's patent of March 7th, 1876, is an operative speaking telephone, then for the same reasons either of Drawbaugh's instruments "L" and "M" is also a speaking telephone. Although intended for use without a battery, two instruments "L," or two instruments "M," or one instrument "L" and one instrument "M," may be joined by, and at opposite ends of a voltaic circuit, and when so joined will operate in substantially the same way to produce the same results, as the apparatus shown thus connected, in figure 7 of Bell's patent of March 7th, 1876.

If Bell's patent of March 7th, 1876, does, as Professor Cross asserts, properly set forth an operative speaking telephone, in which undulatory currents are produced in a circuit by variations in the resistance, then I find in Drawbaugh's instruments "L" and "M," in the forms shown in Defendant's "Exhibits reproduced L and M" drawings, means for producing the same result in the same way, for the reason that in said instruments "L" and "M" the current from a battery is conducted through a series of carbon balls in contact, which carbon balls are more or less pressed together, and the resistance in the circuit more or less varied, and an undulatory current so produced by the action of the diaphragm when thrown into vibration by vocal speech.

I also find in Drawbaugh's instruments "L" and "M" essential elements of Bell's patent of January 30th, 1877, for the following reasons: If two instruments "L" or two instruments "M," or one instrument "L," and one instrument "M," be united upon and by means of an electric circuit, then, if motion of any kind or form be produced in any way in the armature of any one of said instruments, the armature of the other instrument in said circuit will be moved in like manner and form, substantially as set forth in the first claim.

If two instruments "L," or two instruments "M," or one instrument "L," and one instrument "M," be united as transmitter and receiver upon an electric circuit, then there may be produced in the armature of the receiving instrument any given motion, by subjecting said armature to an attraction varying in intensity, substantially as set forth in the second claim.

In both Drawbaugh's instruments, "L" and "M," there exists the combination with an electro-magnet of a plate of iron, which can be thrown into vibration by the movement of the surrounding air, or by the attraction of a magnet, substantially as set forth in the third claim.

In both Drawbaugh's instruments, "L" and "M," there exist means for adjusting the relative position of electro-magnet and plate, so that they may be adjusted together as closely as possible without touching, substantially as set forth in the fourth claim.

There is formed in Drawbaugh's instruments, "L" and "M," a magnet, with a coil upon the end of said magnet nearest the plate, substantially as set forth in the fifth claim.

There is combined with Drawbaugh's instruments, "L" and "M," a sounding box, so constructed as to protect the plate from extraneous sounds, to afford a reduced space in front of said plate, and a reduced orifice opening upon the centre of said plate, substantially as Professor Cross finds sets forth in his sixth claim.

There is combined with the instruments, "L" and "M," a speaking or hearing-tube, for conveying sounds to or from the telephone, substantially as set forth in the seventh claim.

Finally, there exists in Drawbaugh's instruments, "L" and "M," the combination with a permanent magnet of a plate of iron, with coils upon the ends of the magnet nearest the plate, by means of which contrivance the instruments may be used in a telephonic system without a battery, substantially as set forth in the eighth and last claim.

I tested Drawbaugh's instruments "L" and "M," in the same place and under the same general conditions mentioned in descriptions of tests, on December 1st, 1881, attaching each instrument, in turn, to one end of a circuit including a battery, using Defendant's instrument "G," as stated in my previous answer, as a transmitter; as I have already stated, I heard speech clearly on listening at either instrument, "L," or "M."

In order to prevent any ambiguity in this answer, I desire to call attention to the fact, that I have drawn my comparison, so far as the carbon transmitter is concerned, and when referring to Drawbaugh's instruments as containing both carbon transmitter and magneto-telephone, between Bell's devices and the reproductions of instruments "L" and "M," as shown in Defendant's "Exhibits reproduced L and M drawings." These instruments embody both a carbon transmitter and a magneto-electric telephone, as already pointed out. What I understand to be the original forms, of the above named instruments, were used in the tests; and in these instruments, as shown in Defendant's "Exhibits L and M drawings," no carbon transmitter was present. Instrument "L" was used as it is shown, without any adjusting-screw corresponding to the adjusting-screw marked *F*, in Defendant's "Exhibit M drawing," in position, the adjustment of the magnet to the diaphragm being effected by other means. I found, however, that the speech heard through the line, through instrument "M," which had the adjusting-screw in it, was rather the clearer, although other parts intended to be used in connection with that screw were absent; and thus, I believe, it did not work as originally intended.

Q. 41. In the same manner please compare the Drawbaugh instrument "H," here in evidence, with said two Bell patents, of March 7th, 1876, and January 30th, 1877, giving your conclusions and reasons therefor, and referring to any tests you have made.

Ans. The construction of instrument "H," was described quite fully, both by Mr. Knight and Mr. Drawbaugh, in their testimony given in this suit. It is a carbon transmitter, working on the same principle as instruments "G" and "O," already described. The current is led through a series of carbon balls in contact, and is rendered undulatory by these carbon balls being more or less pressed together, and the resistance in the circuit so varied by the vibrations of the diaphragm when speech is uttered before it.

For the same reasons given by Professor Cross, if Bell's patent of March 7th, 1876, does set forth an operative speaking telephone, working through variations in the resistance of the circuit, then I find in Drawbaugh's instrument "H," because of the construction already mentioned, an apparatus constructed on the same principle, to accomplish the same results in substantially the same way.

I also find in Drawbaugh's instrument "H," the elements that Professor Cross finds set forth in the sixth claim of Bell's patent of January 30th, 1877, for the reason, that in said instrument "H," there is combined with an electric telephone, a sounding-box, so constructed as to protect the plate, or diaphragm, from extraneous sounds; also so as to afford a reduced space in front of said diaphragm, and a reduced orifice opening upon the centre of said diaphragm, this construction and arrangement being substantially the same as that existing in the Klemm carbon transmitter.

I tested Drawbaugh's instrumant "H," under the same general conditions and at the same place, referred to in my description of other tests, on November 30th, 1881. I connected the instrument "H," to one end of the line as a transmitter, joined a battery in the circuit, and used Drawbaugh's instruments "D" and "E," alternately, as receivers. I heard speech, uttered through instrument "H," and the line, clearly through the instruments "D" and "E." I also used Drawbaugh's instrument "A," as a receiver, Drawbaugh's instrument "H," being still used as a transmitter, and heard speech distinctly through the line, on listening at instrument "A."

I omitted to mention this test, so far as affecting instrument "A," in my answer describing my tests of that instrument.

Recess for lunch.

March 13, 1882, 2:30 P. M.

Examination resumed, pursuant to adjournment.

Present same counsel.

Examination of Mr. Park Benjamin by Mr. Hill continued.

Q. 42. In the same manner, please compare the Drawbaugh machine "J," with said two Bell patents, giving your conclusions and reasons?

Ans. This instrument is quite fully described by Mr. Knight, in answer to question 147, page 767 [737], of Defendant's printed record, and also by Mr. Drawbaugh, in answer to question 330, page 841 [808], of Defendant's printed record.

The route of the electric current in this instrument is stated by Mr. Drawbaugh in his answer to the 646th question, page 905 [870], of Defendant's printed record, to be correctly shown in Defendant's "Exhibit J" circuits.

Drawbaugh's "J" instrument is constructed on the same principle as his "H" instrument, referred to in my preceding answer; that is to say, the current is led through a series of carbon balls, and is rendered undulatory by the carbon balls being more or less pressed together, and the resistance in the circuit so varied by the vibration of the diaphragm when speech is uttered before it. In Drawbaugh's instrument "J" there are two sets, or series, of carbons affected simultaneously by one and the same diaphragm.

For the reasons given by Professor Cross, if Bell's patent of March 7th, 1876, does set forth a speaking telephone depending for the production of its undulatory currents upon changes of resistance in the circuit, then, in Drawbaugh's instrument "J," which operates on the same principle in like manner to produce like results, I find such a telephone as is set forth in Bell's patent of March 7th, 1876.

I also find in Drawbaugh's instrument "J" the combination of an electric telephone and a sounding-box, said box being so arranged as to protect the diaphragm from extraneous sounds, to afford a reduced space in front of said diaphragm, and a reduced orifice opening upon the centre of said diaphragm, these parts being similar in construction, operation and purpose to those found by Professor Cross to be recited in the sixth claim of Bell's patent of January 30th, 1877, and in the Klemm carbon transmitter.

Q. 43. In the same manner please compare the Drawbaugh instrument "P," here in evidence, with said two Bell patents, giving your conclusions and reasons, and referring to any tests you may have made.

Ans. Instrument "P" is very fully described by Mr. Knight, in answers to questions 140 and 141, pages 756 [726] and 759 [729], and by Mr. Drawbaugh, in answer to question 345, page 848 [814], of Defendant's printed record. In answer to question 646, page 904 [870], Defendant's printed record, Mr. Drawbaugh says, with regard to the electric currents, that they are correctly shown on the tracings marked "Exhibit P tracings, No. 1" and "Exhibit P tracings, No. 2."

Drawbaugh's "P" instrument contains a magneto-electric telephone and a carbon transmitter. The magneto telephone embodies a permanent magnet, to one of the poles of which is fastened a core, around which core is a coil, which is joined in the circuit. In front of the end of the core, which thus becomes a part of the magnet, is a metal plate, which serves as an armature, capable of inducing undulatory currents in the coil by its vibration, or of being vibrated by the magnet, when the latter is affected by undulatory currents passed into said coil. For reasons which I have already fully set forth, in referring to Drawbaugh's instruments "L" and "M" and others embodying a like construction to that above described, I find in Drawbaugh's instrument "P" substantially the same elements found by Professor Cross to exist in the apparatus shown in figure 7 of Bell's patent of March 7th, 1876, and operating in like manner to produce like results.

For the same reasons already stated with regard to Drawbaugh's instrument "L," I find existing in and in connection with so much of Drawbaugh's instrument "P" as has thus far been noted by me, substantially the same elements set forth in Bell's patent of January 30th, 1877, operating in like manner to produce a like result.

In the carbon transmitter contained in Drawbaugh's instrument "P," I find that the resistance of the circuit may be varied by the vibrations of the diaphragm more or less pressing together pieces of carbon through which the circuit is led, the current thus being rendered undulatory. According to Professor Cross' testimony, such an instrument is substantially set forth in Bell's patent of March 7th, 1876, and substantially the same essential elements are therefore present, operating in a like manner to produce the same result, both in Bell's device and in Drawbaugh's instrument "P."

I tested Drawbaugh's instrument "P, reproduced" under the sam general conditions and at the same place, as I have mentioned in describing other tests, and on December 1st, 1881, I attached instrument "P reproduced" at one end of the line and a Tisdel magneto instrument, such as I have already referred to, at the other end of the line; a battery was joined in the circuit. On listening at the Tisdel instrument, I heard speech through the line uttered into the carbon transmitter of Drawbaugh's instrument "P reproduced." Then stationing myself at said instrument "P reproduced," I heard speech through the line, which was uttered into the Tisdel instrument at the other end, finally, by talking, myself, into the carbon transmitter of instrument "P reproduced," and listening at the magneto-telephone of said instrument, I was enabled both to send and receive speech through the line, and conveniently to maintain a conversation with the person at the Tisdel instrument at the other end.

Q. 44. In like manner, please compare the Drawbaugh instrument "N," with said two Bell patents?

A. Drawbaugh's instrument "N," is described by Mr. Knight, in answer to question 146, page 766 [735], and by Mr. Drawbaugh, in answer to question 352, page 851, [818], Defendant's printed record; this instrument contains an electro-magnet, with an armature in front of its poles, which magnet, when undulatory currents are passed through its coil, causes vibrations in the armature, and the armature, when vibrated, modifies, so as to render undulatory, currents led into the coils of the magnet. For reasons which I have already fully given, this instrument "N," contains substantially the same elements found by Professor Cross to exist in the apparatus shown in figure 7 of Bell's patent of March 7th, 1876, operating in like manner to produce like results; also, for the reasons which I have already fully given, with regard to Drawbaugh's instruments "L" and "M," this instrument contains substantially the same elements set forth in Bell's patent of January 30th, 1877, and operating in a like manner to produce a like result.

[*Defendant's counsel asks Complainant's counsel to state on the record what claims, of the two Bell patents, are to be regarded as involved in this suit.*

The Complainant's counsel states, that in their PRIMA FACIE *case their testimony was confined to claim five, of the first patent, see interrogatory* 17, *page* 35, *and to claims five, six and eight, of the second patent, see interrogatory* 21, *page* 40, *of Complainant's printed record; and that the infringement of those claims alone is relied upon in this case. Complainant's counsel, however, states that he does not intend to admit that the in-*

struments do not, in fact, infringe other claims, but merely that the question of the infringement of other claims will not be used as a ground of recovery in this suit.

Q. 45. Will you please look at the fifth claim of Alexander Graham Bell's patent, No. 174,465, dated March 7th, 1876, and, assuming Professor Cross' understanding of that claim to be correct, please state which of all the Drawbaugh instruments here in evidence you find to contain substantially the method and apparatus therein referred to, operating in substantially the same way, and producing substantially the same results as claimed in said fifth claim?

A. Adopting Professor Cross' understanding of that claim, especially to the effect that it includes both magneto-telephones and carbon transmitters, then I find in all the Drawbaugh instruments, about which I have testified, the method and apparatus referred to in said claim, operating in substantially the same way and producing substantially the same results.

Q. 46. Answer the same question with reference to the fifth claim of Alexander Graham Bell's patent, No. 186,787, dated January 30th, 1877?

A. I find substantially the same elements set forth in that claim, operating in like manner to produce substantially the same result, in Drawbaugh's instruments "C," "D," "E," "I reproduced," "L," "M," "N," "P."

Q. 47. Answer the same question as to the sixth claim of the patent last referred to?

A. I find substantially the same elements set forth in that claim, operating in like manner to produce substantially the same result, in Drawbaugh's instruments "A," "D," "E," "G," "H," "I," "J," "L," "M," "N," "O," "P."

Q. 48. If you assume the electric telephone, referred to in that sixth claim, to be the equivalent of any electric speaking telephone, then would or would not Drawbaugh's instrument "F," with its glass tumbler and wooden mouth-piece inclosing the operative mechanism, contain substantially the same invention?

A. I answered the last question assuming Professor Cross' explanation of the claim, as given in his answers to the 23rd and 25th interrogatories, in his testimony in Complainant's *prima facie* case, to be correct; and I find in all the instruments above mentioned the three elements which he points out as existing in that claim, namely: the box inclosing and protecting the diaphragm, the reduced space in front of the diaphragm, and the reduced orifice opening upon the centre of the diaphragm. All of these elements exist in Defendant's instrument "F," though the reduced space in front of the diaphragm is not so clearly apparent in Defendant's "reproduced F drawing" as it is in the reproduced instrument itself.

Q. 49. Referring to the eighth claim, of Professor Bell's patent of January 30th, 1877, please state which of the Drawbaugh instruments here in evidence you find to embody the same invention as therein claimed, assuming Professor Cross' understanding of said claim to be correct?

A. I find substantially the same elements set forth in that claim, operating in like manner to produce substantially the same results, in Drawbaugh's instruments "C," "D," "E," "I, reproduced," "L," "M," "N," "P."

Adjourned until March 14th, 1882, at half-past ten o'clock, A. M.

March 14th, 1882, 11 o'clock, A. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Examination of Mr. Park Benjamin by Mr. Hill continued:

Q. 50. Please examine the cup-machine described by Mr. Daniel Drawbaugh, pages 787 to 703, [756 to 761,] of Defendant's printed record, and state what inventions you find therein, and how said inventions compare with the inventions described and claimed in the two Bell patents here in controversy?

A. The apparatus described by Mr. Drawbaugh chiefly in his answer to the 51st question, page 788, [757,] Defendant's printed record, is a telephonic transmitter substantially similar in construction and operation to his instrument "F." The current passes, through a rod attached to the diaphragm, to a plate resting on finely pulverized material, such as pulverized charcoal or other forms of carbon; thence to a cup-shaped plate beneath said material; and finally, through a wire fastened to said plate, to the circuit. The diaphragm, on being vibrated by sound-waves produced by the voice, causes more or less pressure to be applied to the pulverized carbon, thus varying the resistance offered by said carbon to the current, so rendering the latter undulatory. If, as Professor Cross considers, Bell's patent of March 7th, 1876, does properly set forth a telephone operating through variations in the resistance of the circuit, then, in my opinion, the instrument referred to and described by Mr. Drawbaugh embodies the same principle in substantially the same way and operates to produce a like result. If, however, Bell's patent of March 7th, 1876, is not considered to set forth such a telephone, and if, in consequence, his patent of January 30th, 1877, is construed to cover any form of electric speaking telephone, then the apparatus described by Mr. Drawbaugh, as above stated, being an electric speaking telephone, when used with a suitable receiver and with a battery in circuit, embodies broadly what is set forth in said patent of January 30th, 1877. I understand that this transmitter was used in a circuit with a battery, and with a receiver analogous in form to Defendant's Exhibit "B" instrument.

Q. 51. Please examine the modified instrument "B," as described and represented on page 794 [762], of Defendant's printed record, and state what inventions you find in it, and how it compares with Defendant's instrument "B," here in evidence.

Ans. The principle involved in the operation of this instrument and Defendant's instrument "B" is the same in both. In the instrument shown in the "Exhibit D. Drawbaugh sketch, No. 2," the electromagnet is placed at a considerable distance from the diaphragm, and the armature arranged before the poles of the magnet, instead of being fastened to and in contact with the diaphragm itself, is connected thereto by a cord extending between armature and diaphragm. When said armature is caused to vibrate by undulatory currents passing through the coil of the magnet, these vibrations are transmitted to the diaphragm through the medium of the tense string, which is obviously a purely mechanical connection.

The differences, therefore, existing between this instrument and Defendant's instrument "B" are not essential ones, and consequently, for the same reasons already given with regard to Defendant's instrument 'B," I find in the apparatus shown in Defendant's "Exhibit D. Drawbaugh sketch, No. 2," the same essential elements Professor Cross finds in the apparatus shown in figure 7 of Bell's patent of March 7th, 1876, operating in substantially the same way to produce the same result. I also find in Defendant's "Exhibit D. Drawbaugh sketch, No. 2," means for easily adjusting the relative distance of armature and magnet, substantially as set forth in Bell's patent of January 30th, 1877, this means residing in the possibility of loosening the screw which holds the armature-spring *G*, so that the armature may be adjusted with relation to the magnet and the screw afterwards tightened.

Defendant's "Exhibit D. Drawbaugh sketch, No. 3," shows the transmitter referred to in my preceding answer, the apparatus shown in "D. Drawbaugh sketch, No. 2," and a battery, joined in a closed circuit. In my opinion, the instruments thus joined together, for the reasons already given, constitute an operative telephonic system capable of transmitting and receiving speech by means of an undulatory current.

Q. 52. Please examine the testimony of Mr. Daniel Drawbaugh, pages 808 to 817 [776 to 785], Defendant's printed record, relating to the original modified form of the Drawbaugh instrument "C," and compare the modified instrument with the instrument shown in exhibit "reproduced" "C," making such observations upon the relation of the two instruments to each other, and to said two Bell patents as you think proper.

Ans. I understand from Mr. Drawbaugh's testimony that the body or chamber of instrument "C" originally contained two diaphragms—membranes—one of which was held between the two parts of the chamber—that is, the main body and the rim—by friction, and the other was fastened over the end of the rim. To this second diaphragm was attached an armature, and between the two diaphragms, at their centres, extended a string. The diaphragm first mentioned had several small holes made in it. Facing the armature was the electro-magnet. So that, to sum up, the order of parts was, as I understand it, first, the electro-magnet; then the armature in front of its poles attached to a diaphragm, which diaphragm extended over the mouth of the rim of the body of the instrument; then a second diaphragm, which was perforated, parallel to the first and held between rim and body, there being a string between the centres of these diaphragms; then the sound concentrating-tube formed by the body; and finally the orifice at which sound was received.

It will be obvious that, essentially, the instrument, as thus constructed was the same as Drawbaugh's instrument "B," with the addition of the second diaphragm connected, as stated, to the one carrying the armature. But this second diaphragm, merely repeating the movement of the first one by a mechanical connection, would in nowise affect the operation of the instrument in principle nor, in fact, could it be of any material use therein. Consequently the instrument "C" in the form in which Mr. Drawbaugh states it originally was, and as I have described it above, contains substantially the same elements as Professor Cross finds shown and described in figure 7 of Bell's patent of March 7th, 1876, operating in substantially the same way to produce the same result, for the reasons that I have already given in comparing Drawbaugh's instrument "B" with the aforesaid device of Bell's.

As, in pointing out the difference between his original construction of "C" and that shown in Defendant's exhibit reproduced instrument "C," Mr. Drawbaugh makes no mention of his method of holding the magnet in place, I infer that the method of securing it, in the original form of the instrument, was the same as is now shown in the reproduced instrument; that is, by the screw and plate *e*, *é*, in Defendant's "reproduced "C" drawing." This arrangement obviously affords a means of adjusting the distance of the magnet with relation to the armature, by loosening the screw *é*, then sliding the magnet into the desired position and finally tightening the screw. If, as I understand, this contrivance existed in the original form of the instrument as I have described it above, then that instrument contained the means of adjusting the relative distance of magnet and armature, substantially as set forth in Bell's patent of January 30th, 1877.

Referring now again to Mr. Drawbaugh's testimony, I find that he describes the modifications which he made in the original form of the instrument, to convert it into the form shown in Defendant's Exhibit "reproduced" "C," to be the following:

It should be remembered that the original instrument was intended to be used as a receiving instrument with a battery; that is, in the same way the instrument "B" was used. Consequently the most important improvement was the addition of the permanent magnet, whereby the apparatus could be used without a battery. In adding this magnet, Mr. Drawbaugh says he took off a bar which connected the cores of the electro-magnet—which bar simply completed the U formed by itself and the cores—and then brought the poles of the permanent magnet in contact with the ends of the cores. In other answers I have explained what the effect of this is, so far as rendering the cores magnetic is concerned.

The modification next in importance was the removal of part of the rim of the body of the instrument, and the suppression of the perforated diaphragm and the connecting string. The result of that modification was a shorter or shallower sounding-box, with only one diaphragm.

Lastly, he changed the diaphragm which remained, from a membrane to a thin German-silver plate.

Now, by comparing these modifications with what Bell sets forth in his patent of January 30th, 1877, it will be seen that both Drawbaugh and Bell traveled over pretty much the same road. Assuming Bell's device in his patent of March 7th, 1876, to be an operative one, then, it being substantially the same, as I have already pointed out, as Drawbaugh's original instrument "C," it will be seen that in passing from the form shown in the 1876 patent to that shown in the 1877 patent, Bell added the permanent magnet, and thus virtually suppressed the battery in the circuit; so did Drawbaugh, in passing from the early to the later form of "C." Bell reduced the space in the sounding-box, in front of the diaphragm; so did Drawbaugh. Bell provided a reduced orifice in the sounding-box, opening upon the centre of the diaphragm; so did Drawbaugh. Bell substituted a plate of inductive material for the membrane diaphragm; so did Drawbaugh. Bell arranged his coils on the ends of the magnet nearest the plate; so did Drawbaugh. Drawbaugh had a means of adjusting the distance between magnet and plate already in his early instrument. So that, generally, so far as the changes in organization went, Drawbaugh in substance seems to have omitted but one change that Bell made, and that was, making the sounding-box entirely inclose the plate.

Recess for lunch.

March 14*th*, 1882, 2:30, A. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Examination of Mr. Park Benjamin by Mr. Hill continued.

Q. 53. Please examine the testimony of Daniel Drawbaugh, pages 798 to 808 [767 to 776], Defendant's printed record, with reference to his modifications of the machine "F," and compare those modifications with the machine "reproduced" "F," here in evidence, and with the two Bell patents involved in this suit.

Ans. In the testimony of Mr. Drawbaugh, referred to in the question, I find that he states that his instrument "Exhibit F reproduced" differs in some particulars from the original form of that instrument which he made, and chiefly as follows:

In the original instrument the lower plate or cup supporting the carbon was sustained by only one rod, instead of by two or a yoke, as in the modification of the instrument represented in Defendant's "Exhibit F reproduced." This single sustaining rod is shown in Defendant's "Exhibit F." So far as the actual working of the instrument was concerned, this variation would make no material difference, although the yoke support would be the better of the two, as affording more positive means of adjustment. Mr. Drawbaugh also says that the mouth-piece of the original instrument was varied in form. In the earlier forms which he made the orifice was larger and the space between the orifice and the diaphragm was higher. This difference appears on comparing the mouth-pieces respectively on instruments "F" and "F" reproduced. It will be noticed, also, that in both of these instruments the diaphragm is entirely inclosed and protected by the casing. So that, having the diaphragm thus protected in his earlier form of instrument "F" by a sounding-box, substantially as Bell has it in his patent of January 30th, 1877, all that Drawbaugh had to do, in order to embody in his sounding-box all the elements Professor Cross finds in Bell's sounding-box in the aforesaid patent, was to reduce the space in front of the diaphragm. There was, in fact, already a reduced orifice opening upon the centre of the diaphragm, and it is obvious that by reducing that orifice still further Drawbaugh would approach still nearer to the form and arrangement of orifice shown by Bell; and this is just what he did, cutting down the space between the diaphragm and mouth-piece to a very small area, and lessening the orifice, as plainly appears on comparison of instruments "F" and "F reproduced." In the original instrument Mr. Drawbaugh says, that the diaphragm was of bladder, or parchment; and I understand that the metal rod extending therefrom to the upper plate, which presses on the carbon, was connected to the diaphragm by a metal disc, through which electrical connection was made. Subsequently the parchment diaphragm was replaced by a metal diaphragm; and, in this particular, Mr. Drawbaugh obviously made the same change between the earlier and later forms of his instrument, as Bell made between the instrument shown in his patent of 1876 and that shown in his patent of 1877.

The foregoing seem to be the principal changes set forth in the testimony referred to, and they would not, in my opinion, affect the operation of the instrument in principle as a carbon transmitter; so that the early form of "F," as described by Mr. Drawbaugh, would contain what is set forth in Bell's patent of March, 1876, as found by Professor Cross, for the same reasons that I have already given with reference to Drawbaugh's instrument "F reproduced."

Q. 54. Please refer to the various instruments made by Mr. Drawbaugh, and state whether you find any, and if so, which ones, to be good, full-sized, practical, working, speaking electrical telephone instruments.

Ans. All of Mr. Drawbaugh's instruments that I have tested I know to be good, full-sized, practical, working, speaking electrical telephone instruments; and with regard to his instruments and forms of instruments, to which I have referred in my previous testimony, but have not tested, I consider that these, by reason of their form and construction, may fairly be included in that description.

Q. 55. Take Mr. Drawbaugh's development of his invention, as shown, for example, in the following machines, to wit: the old cup transmitter, the carbon transmitter "F," the receiver "B," the magneto instruments "C" and "I," the receiver "A," and the magneto instruments "D" and "E," and state how the degree or extent of the development or perfection of the invention, as shown in those instruments, compares with that shown in the instruments described and represented in Professor Bell's two patents here in controversy.

Ans. In the category of instruments given to me in the question, the old cup transmitter and the instrument "B," mark the beginnings, apparently, of two separate lines of invention, the one leading to the development of a telephone in which the undulatory current is produced by variations in the resistance of the circuit; the other to the magneto-telephone, which depends upon variations in the electro-motive force of the current. In some particulars these two lines of invention have run side by side, the improvements originally made in the one being applicable to both, and subsequently so used. With the exception of two, the instruments named to me in the question depend for their operation upon variations of the electro-motive force of the current, and so I am confined to tracing the development of that class of telephones, as shown in the instruments indicated.

The two instruments which go to make up the earliest telephonic system, of those mentioned, are the old cup transmitter and one form of instrument "B." These were joined in an electric circuit with a battery, and for the reasons that I have already given, they constituted an operative speaking telephonic system. In these instruments and their arrangement was embodied not only substantially all that Professor Cross finds existing in Bell's patent of March 7th, 1876, operating in substantially the same way to produce a like result, but also an improvement, in the shape of means for adjusting the relative position of the magnet and armature in the receiver, which Professor Bell did not describe in his patent of March 7th, 1876, but did describe as a new and original invention, in his patent of January 30th, 1877. The cup transmitter gave place to the transmitter "F," and, in passing from the one to the other, Mr. Drawbaugh adds the mouth-piece or cover, thus rendering the diaphragm completely inclosed, and alters somewhat the arrangement of the means for holding the carbon in the cup Then, modifying "F" still further, he makes therein a sounding-box, which as I have shown, contains all the features of Bell's sounding-box, and substitutes for his membrane diaphragm a plate diaphragm, such as Bell describes in his patent of January 30th, 1877. So that, in his instrument "F," Drawbaugh had, under the assumption that Professor Cross' views relating to the subject are correct, Bell's means for transmitting speech by the undulatory current, Bell's diaphragm, and Bell's sounding-box, all combined and operating together in a single, practical working instrument.

The development of instrument "B," into instrument "C," I have already traced through the earlier form of the last mentioned instrument, as described by Mr. Drawbaugh in his testimony; and in referring to "reproduced" instrument "C," I found all the essential features of Bell's device of January 30th, 1877, except the case fully inclosing and protecting the diaphragm; but this feature, as I have shown, existed in "F;" so that, at this stage in the development of his apparatus, Mr. Drawbaugh had invented, apparently, every feature of the speaking telephone which Mr. Bell is claimed to have invented, in his two patents in suit. If there is any possible flaw in this reasoning, it seems to me to lie only in the fact that Drawbaugh embodied the inclosing sounding box in one contrivance, and all the rest, of the device described in Bell's patent of January 30th, 1877, in another. Although both devices were speaking telephones, still it might be urged that it is not quite fair to carve pieces out of different machines, and put them together to suit one's self, and so make another contrivance. Mr. Drawbaugh effectually annihilates that objection in his instrument "I," (Defendant's "Exhibit I reproduced.") These he actually puts together in one compact instrument, the separated features above mentioned.

Beyond the point thus reached there appears very little room for improvement, except in form, with the object of disposing the several parts in smaller compass and rendering the instrument, if not cheaper in construction, at least more convenient to handle. This has been the tendency of other telephone constructors since the date of Mr. Bell's patent in suit, although the advance that has been accomplished in this direction has not been great. The magneto receiver now used on telephone lines in this city is scarcely, if at all, different in form and appearance from the Bell instruments which I used in 1877.

Adjourned until March 15th, 1882, at 10:30, A. M.

March 15*th*, 1882, 11, A. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Examination of Mr. Park Benjamin by Mr. Hill continued.

[*Witness continues.*]

The change in form from Drawbaugh's instrument "I" to his instrument "A" will be readily apparent from their inspection. Instrument "A" was not intended as a transmitter, or for use without a battery; so that the permanent magnet is not embodied in it. Used with a battery it could be employed either as a receiver or transmitter; and beyond the change in form perhaps the most characteristic improvement in it lies in the means for effecting the nice adjustment of magnet and armature, to which I have already referred in a previous answer.

The instruments "D" and "E" show the magneto-telephone in as compact form as it has ever been constructed, up to the present time. The magnet is flattened and curled, so as to occupy the least possible space; the means of adjusting the distance between core and diaphragm is simple, positive and easily controlled; and the instruments themselves, as I have proved, are excellent, working, speaking telephones on a circuit without a battery. They embody all the elements going to make up a speaking telephone, as described in Bell's two patents in suit. And in fact, I see no reason why, if these machines were now manufactured and were upon the market, they would not, so far as form, construction and operation are concerned, successfully compete with any forms of magneto-telephone now in vogue.

Q. 56. You have stated in your last answer that since the Bell telephone was introduced into public use, constructors had turned their attention towards improving the form and arrangement of the instrument; what knowledge have you as to the amount of effort that has been made in this direction, the number of inventors that have been employed in endeavoring to improve the electric speaking telephone, the number of patents that have been granted in this country for such alleged improvements, etc.?

A. I do not wish to be understood as saying that improvements in the telephone in general have been limited to improvements in form only. That statement had reference more particularly to the magneto-telephone as a single instrument, and not to telephonic systems generally. For there have been a great many inventions of apparatus for use in connection with telephones, parts of telephones, and in the direction of rendering their capabilities greater. I am aware that large numbers of patents have been granted for inventions of this kind, and that these numbers appear to be increasing. Thus, by reference to the official indexes of patents granted by the United States Patent Office, I find the number of patents issued and indexed under the word "telephone" to be about as follows:

1878,	33.
1879,	64.
1880, more than	100.
1881, first six months,	95.

These patents were granted to a large number of inventors. I have not seen any official index of patents issued since the one for January to July, 1881, and believe that no half-yearly index of later date has yet been given to the public. I understand that there are many patents for inventions relating to the telephone existing not classified in the indexes under the heading above mentioned, but appearing in said indexes under other headings.

Q. 57. Mr. Daniel Drawbaugh has testified, in effect, that after producing the small magneto instruments "D" and "E" he produced a number of other electric speaking telephone instruments from time to time, some of which are here in evidence. Please look at the instruments "G," "L," "M," "O," which he says came next after the small magnetos "D" and "E," and also look at the instrument "H," which he says came next after "G," "L," "M," "O," and state whether you find that he had therein developed any additional improvements, and to what extent?

A. The instrument referred to in the question I regard as the practical outcome of Mr. Drawbaugh's following the other of the two lines of invention referred to it one of my previous answers. In that answer I described the development of the magneto-telephone, as effected by Mr. Drawbaugh; so that now I have to refer to his development of the carbon transmitter, as shown by the instruments mentioned. I have already stated that this line of invention had its beginning in the old cup instrument; then followed instrument "F," and now, next in the order of development, come the instruments "G" and "O." In using the instrument "F" Mr. Drawbaugh found, as I understand him, that the powdered carbon, which he employed between the plates, was apt to become displaced, and so affect the working of the instrument; and that thereupon it occurred to him that it would be advantageous to make the carbon in solid form and in two or more pieces held in contact, the pressure between which, as before, would be varied by the action of the diaphragm. In the instruments "G" and "O" he carried out this idea, moulding the carbons into balls, which he placed in series in contact. It is curious to note that when he hit upon this idea he invented the microphone. That instrument usually consists of a piece of carbon, pointed at the ends, which are in loose contact with its supports, the current being modified by the variations of pressure between said ends and the supports. Of course this instrument is virtually the same in principle as the ordinary carbon transmitter, depending as it does upon variations of resistance in the circuit to modify the current. It is, however, more sensitive to faint sounds, and when the invention of it was first made public, in 1878, it was looked upon as a great, original discovery. By moulding his carbons into balls, or nearly ball-shaped pieces, so that they touched only a point, Mr. Drawbaugh practically made a microphone transmitter; and as a result, as my experiments showed by actual tests of the two forms of instruments, he obtained in "G" and "O" transmitters of considerably greater efficiency than instrument "F."

At the same time, he materially modified the form of the apparatus, rendering it more compact and convenient to handle, and providing means of adjustment, whereby he could regulate the contact of the carbons and so govern the normal resistance which the instrument would offer to the current.

In the forms of the instruments "L" and "M," in which the carbon transmitter appears, Drawbaugh's two lines of invention run together again; in each of these instruments he combines, substantially, his carbon transmitter "G," or "O," with his magneto-telephone "I," following more nearly the form of the latter instrument, and producing an apparatus embodying both principles in one device, thus uniting the advantages of a carbon transmitter with those of the magneto receiver. When he made his apparatus in this form, he put together a receiver and transmitter of different kinds, so that a subscriber on the line of the system, or telephone exchange, could have both at his command; in practice, however, I believe it has been found to be not advantageous to combine these two instruments in one, and that it is better to have a separate receiver, which the user can keep applied to his ear, while talking into the transmitter.

In the instrument "H," Mr. Drawbaugh brings his carbon transmitter to a higher degree of perfection. Recognizing that an instrument of that class need not necessarily be in portable form, he enlarges his sounding-box, which he intends shall be permanently secured in some convenient place. He modifies the construction of the apparatus for holding the carbon balls; so that what might be called a more elastic contact is gained between them; and so that their adjustment may be more accurately effected; thus rendering the apparatus more sensitive to the vibrations of the diaphragm. He added an induction-coil, the primary current of which passed through the carbon and the battery, and the secondary current went to the line; and he arranged, in connection with the instrument, a call-bell, which could be operated by means of the current, to attract the attention of the user.

It may be noted with regard to the improvement effected in his instrument "H," by Mr. Drawbaugh, in the means of holding the carbons, that the same is perfectly described by Professor Cross in his affidavit in Complainant's moving papers for a preliminary injunction; page 48, he says: "Speaking telephone battery transmitters, which vary the resistance of the circuit by the movement of the diaphragm, without the use of any liquid, have been in common use upwards of two years, and known somewhat longer;" and then, after mentioning the carbon, he says, that the tendency of this piece to move away from the diaphragm when the latter is vibrated is opposed by a firm and fixed support, which holds it in place, or by a tolerably stiff and sluggish spring, or by the inertia of a weight; either of which serves like an anvil, to resist a very quick and sharp impulse, such as comes from the vibrations of the diaphragm. After mentioning, that against the other side of this piece, which is commonly called the button, is an electrode carried by, or in contact with, the diaphragm, he refers to some patents, which, he says, show substantially this arrangement, and then refers to the Blake transmitter made by the Bell Telephone Company, which, he says, has been in public use since the beginning of 1879, or longer.

Recess for lunch.

March 15*th*, 1882, 2 P. M.

Examination resumed pursuant to adjournment.

Examination of Mr. Park Benjamin by Mr. Hill continued.

[*Witness continues.*]

Professor Cross describes this Blake instrument as follows: "A carbon transmitter, in which the contact is made between a metallic electrode carried on a spring and kept in contact with the diaphragm, so as to be vibrated by it, and a weighted carbon electrode carried on the end of a stiff spring provided with an adjusting-screw." Take the word "weighted" out of that quotation, and it correctly describes the carbon-holding arrangement in Drawbaugh's instrument "H," both contrivances operating in substantially the same way to produce a like result. Reference to Complainant's drawing of Exhibit Blake transmitter, in Complainant's moving papers, for a preliminary injunction, will show the similarity between the form of the Blake transmitter and Drawbaugh's instrument "H," even to the apparatus arranged on the door or cover of the box, and the presence of the induction-coil. Substantially the same arrangements appear in the Klemm carbon transmitter, one of the alleged infringing devices in this suit.

Q. 58. You have stated, in the foregoing answer, that the arrangement of a magneto-electric telephone and a carbon transmitter, substantially as shown in Drawbaugh's instruments "L" and "M," has not come into general use, it being found that it was more advantageous to have the transmitter and receiver separate, for purposes of convenience; state whether you find in any of Mr. Drawbaugh's instruments, which you have examined and about which you have testified, any arrangement of a magneto-receiver and carbon transmitter, whereby both devices may be used simultaneously, the operator speaking into the one and listening at the other?

Ans. Such an arrangement I find to exist in Drawbaugh's instrument "P, reproduced." The diaphragm of the magneto-telephone, in that instrument, has in contact with it a spiral wire, which extends through a long flexible tube, and touches another diaphragm in the ear-piece at the end of said tube; so that the vibrations of the first diaphragm are, by the wire, communicated to the second diaphragm. The operator can then hold this ear-piece to his ear, and listen while speaking into the carbon transmitter of the instrument.

Q. 59. You have classified these telephones in two general classes, or systems, to wit, the carbon class and the magneto class. Does your classification relate more particularly to transmitters, or to both transmitters and receivers, and in which class do you place the Drawbaugh receivers, "B" and "A"?

Ans. In some respects, the "B" and "A" instruments stand midway between the two classes; like the carbon instruments, they must have a battery in circuit, but when a battery is used with them they operate on the same principle as the magneto-electric instruments. I suppose it would be a more scientific classification to call these instruments electro-magnetic telephones, in contradistinction to magneto-electric telephones.

Q. 60. In testing the magneto instruments "D" and "E," did you observe whether or not they had apparently suffered any deterioration from previous rough usage or handling?

Ans. I don't know that such deterioration as they appear to have undergone should be ascribed to that cause, as much as, apparently, to age. There had evidently been shrinkage of the wooden parts; various portions had worked loose; and, in fact, the instruments were somewhat shaky. This does not affect their operation when they are adjusted, or while they are held so as to prevent any change of position of the parts, but it renders it difficult to keep them in adjustment, and practically makes it necessary to readjust them after an interval of disuse.

Q. 61. A large number of witnesses examined for the defense in this case, have testified in effect, that a good many years ago they heard talking through instruments at Mr. Drawbaugh's shop, at different times, some at one time and some at another, from 1869 down to 1880; that the instruments were, or Mr. Drawbaugh said they were at the time, operated by electricity; that they heard the talking through the instruments, so as to hear and understand what was said through them;

and many of the witnesses say that they were able to distinguish one person's voice from another through the instruments; and that many of them heard other sounds, and distinguished what they were, through the instruments. From your knowledge of the laws governing the transmission of sound, by electricity, would you or would you not, from these statements of the witnesses referred to, be able to determine the general principle of the machine or machines so used? If yes, give your conclusions and reasons, and state how the testimony of Professor Cross, given in this cause, would affect your conclusions, if at all?

Ans. For reasons fully set forth by Professor Cross in his testimony, with which I have already stated my substantial agreement, it is not possible to transmit articulate speech through any apparatus depending for its operation upon an interrupted, or "make-and-break" current of electricity. Consequently, under the statement of facts in the question, the apparatus through which the witnesses heard speech could not have been operated otherwise than by an undulatory current, and that apparatus, according to Professor Cross' views, must consequently have been, in that respect, substantially as set forth by Bell in his two patents in suit.

Though perhaps not called for by the question, I should like to add, that if the witnesses referred to could testify that they saw the wire running between the transmitting and receiving instruments nailed up against walls or turning corners in contact with the building, then it would not be necessary to include in the foregoing statement of facts any statement by the witnesses that said wires were, or that they were told they were, in an electric circuit; because such an arrangement of wire would bar out the possibility of the sound being mechanically transmitted along it, as is the case when a tense string, or wire connects the diaphragms of two of the so-called "lover's telephones;" these telephones, other than those using the undulatory electric current being the only ones which will transmit speech; and their operation depends, as I have indicated, upon the connecting string or wire being perfectly free to be moved mechanically by the vibrations of a diaphragm.

Q. 62. Professor Bell has somewhere indicated his opinion that the quality, or timbre, of sound is ultimately resolvable into the two elements of loudness and pitch, or, speaking with reference to the sound vibrations, into the two elements of amplitude and frequency. Have you considered this subject; if so, what is your opinion upon it, and what your reasons therefor, and what practical bearing has the matter, if any, upon the questions here involved?

Ans. I have already testified in an answer hitherto given, that in his patent of March 7th, 1876, Mr. Bell has stated that the instrument described therein is capable of reproducing sounds in both their characteristics of loudness and pitch. And I have also stated, that when Mr. Bell contrived an apparatus having these capabilities, he accomplished a material advance in the art. I also said, in substance, that, in my opinion, Mr. Bell intentionally left out of his patent of March 7th, 1876, any statement or indication that his apparatus would transmit the timbre or quality of sound, apparently leaving such a contrivance to be described in operative form in the later of the two patents now in suit. Now, if Mr. Bell's statement that quality is resolvable into the elements of loudness and pitch (and that statement will be found on page 19 of Mr. Bell's affidavit, attached to Complainant's moving papers for a preliminary injunction in this case; and also, I believe, in his testimony, as the question states), is to be taken as true in its application to the speaking telephone, then it seems to me that his assertion could be made into a convenient peg on which to hang the conclusion that if the instrument set forth in Bell's patent of March 7th, 1876, would transmit what Mr. Bell thinks are the elements of quality, therefore it could transmit quality itself. Looked at in this way, it will be seen that Mr. Bell's statement, made long after he had obtained his patent in March, 1876, might easily be twisted into a bearing on this case which would lead the Court astray, even if that object were wholly unintentional.

It will be found, I think in Professor Cross' testimony, that he himself speaks of quality as an "element" of sound; and as the word "element" simply means something that cannot be resolved into constituent parts, his very use of the term negatives his idea of its resolution. Neither do I gather from Professor Cross' testimony that he accords with Professor Bell in the view above stated; but on the contrary he takes considerable pains to point out, and I think does so with much ability, that pitch is one thing, loudness another, and quality another—all three different.

The difficulty in the application of Professor Bell's statement to the terms of his patent, as I have pointed out, (and it is just here I think that error is likely to be inadvertently made), lies in the fact that, regarded in one sense, (and that an exceedingly broad and general one), as I shall point out, Professor Bell's assertion involves some truth; whereas, in its application to the subject matter of this case, namely, the telephone as an instrument for transmitting articulate speech, I don't think it is true.

To illustrate: The position of any point on a plane can always be described by stating its distance from each two lines drawn at right angles to each other in that plane; so for any number of points; and so for any curve or any figure that can be drawn. Now, when we undertake to represent graphically sound-waves by curves, as Professor Bell does in his patent of March 7th, 1876, and as Professor Cross does in his answer to interrogatory 8, in Complainant's *prima facie* case, it is quite true, as Professor Cross sets forth, that by measurements along a vertical and a horizontal axis, the portion of any point on that curve may be determined; that is to say, as he expresses it, by determining for each point the length of the abscissa and of the ordinate for that point. Now this is true of any curve; so that, even if the form of the curve were varied so as to include an almost infinite number of sinuosities, it still would be mathematically possible to lay down the position of every point in it, in the matter stated. Consequently, if we take the position of a point measured from one axis to represent pitch, and from the other to represent loudness, then we can refer every point in the curve to the elements of pitch and loudness, no matter how the position of the points may be caused or varied.

In this sense it would be possible still, as Professor Cross indicates, to take a curve, such as shown in the diagram of his answer to interrogatory 9, and which he states represents the motion of a particle under the influence of sound-waves, and which, in addition to showing pitch and loudness, also shows quality by its peculiar form, and fixes the position of every point thereon by measurement in two directions, one of which we have agreed shall represent pitch, and the other loudness. That is to say, we can handle the subject theoretically in that way, in pretty much the same way that we can handle vast quantities through the aid of algebraic symbols, or indulge in the scientific use of the imagination to reach conclusions which we never could attain through any course of physical experimenting. The difficulty of this mode of procedure often lies in our mistaking the symbols for the things, and assuming that what is true intrinsically of the symbols is equally true of what they represent. This is the error which Professor Bell has apparently fallen into, or at least, it is only by assuming that to be the fact that I can find substantial foundation for his statement above quoted.

Now, if I understand the question before me correctly, it is not whether Mr. Bell or anybody else can show theoretically, by graphic representations of sound-curves, that the changes in form due to quality can be described by reference to distances taken to represent pitch and loudness; but whether an instrument, which is capable of transmitting pitch and loudness, is by reason thereof, practically able to transmit quality also. Theories in physics are one thing, and facts are another, and there is scarcely a theory that has not been turned upside down in the last two centuries. They are only valuable so far as they account for most of the observed phenomena, and modern scientific reasoning is inductive from facts, and not deductive from theories. If there is any department of physics in which theories are likely to go astray, it is electricity; and the more cautious and careful any one is in explaining the why and wherefore of electrical phenomena, save by the rigid answer of actual experiment, the less likely is he to be obliged to revise his theories afterwards.

I have already stated in answers to previous questions that I can see no reason why, if Professor Bell thought that his instrument would transmit quality, he did not state as much in his patent, instead of leaving it to inference; or why, in a curve which he shows and states to represent without error the vibration of a body capable of inductive action, he could not have put in or indicated some changes in form to represent quality; more especially, in view of Professor Cross' statement, that "the variations between the sound-waves which constitute a given articulate sound, and those which constitute a sound not recognizable as articulate speech, are such, that an excessively minute departure from the theoretical requirements will substantially deprive the instrument of all practical value."

The quality which Professor Bell undertook to transmit is stated to be the quality of articulate speech. In an instrument of comparatively gross construction, it appears that he found he could transmit pitch and loudness, and this instrument, which is represented in figure 5 of his patent of March 7th, 1876, I do not understand Professor Cross to assert would transmit quality of speech. According to Professor Bell, it should do so, because it transmits pitch and loudness. Professor Cross confines himself substantially in his testimony to the apparatus shown in figure 7, and in the difference between that apparatus and the one shown in figure 5 of the same patent resides, he substantially says, its capability of transmitting speech. I leave Professors Bell and Cross to reconcile their opposing views as best they can, the one virtually asserting that his instrument can transmit quality, and hence inferentially, articulate speech, because it transmits pitch and loudness; and the other, that the specific apparatus he refers to in his testimony transmits articulate speech, because of its specific differences from the contrivance which Professor Bell substantially asserts is already capable of doing so. I have simply to point out, that the particular apparatus set forth in Bell's patent of March 7th, 1876, and referred to by Professor Cross, will not transmit anything, when made in accordance with what is set forth in the patent.

[*Complainant's counsel objects to the answer, as containing a misrepresentation of the testimony on behalf of the Complainants, and further objects to the answer as immaterial, because based on a misrepresentation of the evidence for the Complainants.*]

Adjourned until March 16th, 1882, at half-past ten o'clock, A. M.

March 16*th*, 1882, 10:30 o'clock, A. M.

Examination resumed pursuant to adjournment.

Present same counsel.

[*Examination of Mr. Park Benjamin by Mr. Hill continued.*]

[*Counsel for Defendants states that the witness has not intended to misrepresent the statement of Professor Bell, as is shown by the fact that he refers to his testimony, to the volume and page where Professor Bell's own language can be read; and the fact that the Defendants' expert and the Complainants' counsel seem to understand Professor Bell differently shows the propriety of directing the attention of the Court to the somewhat ambiguous or obscure nature of his statement.*

Complainants' counsel objects that the allegation of Defendants' counsel that Mr. Bell's statement referred to is ambiguous or obscure, is not evidence in the case, and not proper to go on the record.]

Q. 63. Then, if I understand you correctly, your opinion is, that even if theoretically, the different points assumed by a particle of air in the course of a sound-vibration might be graphically represented in terms of loudness and pitch only, yet it does not follow that an instrument capable of transmitting or reproducing only loudness and pitch would be necessarily capable of transmitting or reproducing articulate speech; is my understanding correct?

Ans. Yes; there are a great many other things that can be proved and realized theoretically, but which are not open, so far as we now know, to practical mechanical demonstration. To illustrate; I can measure the diameter of this ink-stand with a foot-rule, but when it comes to measuring the diameter of a molecule of matter, although the molecule is just as much of a physical entity as the ink-stand, there is no measuring instrument in creation by which I can do it. And yet the size of molecules has been measured theoretically, and Sir William Thomson fixes their thickness between one-two hundred and fifty millionth and one-five billionth of an inch. The capabilities of mechanical apparatus are very limited, and when such apparatus is called upon to deal with the very minute in nature, very slight causes are apt to render it wholly inoperative. Professor Cross has pointed out very fully the delicate, and almost infinitesimal nature of the vibrations that go to determine the quality of a sound; and hence, it seems clear to me, that while an instrument might transmit the comparatively gross characteristics of pitch and loudness, it might, by its very construction, be incapable of also transmitting the delicate characteristic of quality; so that when that instrument is described presumably in a manner which will enable other persons to make it, it seems to me that if it is intended to transmit quality, both the facts should be so distinctly stated, and the construction of the instrument accurately shown. And if this is true of the transmission of quality in general, it is certain with regard to the transmission of a particular kind of, and exceedingly subtle quality, namely, that which characterizes articulate speech.

Q. 64. What opportunities have you had during the last four months, for becoming personally acquainted with Daniel Drawbaugh, and for knowing the extent of his literary and mechanical acquirements?

Ans. During the last four months I have resided in Harrisburg, Pennsylvania, for about two-thirds of the time, and during this period I have had almost daily opportunity of conversing with him at considerable length regarding his inventions, not merely for the purpose of enabling me to testify intelligently here, but to gratify my own curiosity; for I think I can safely state, that there is no parallel instance in the whole history of invention, at least so far as I know it, of any one having accomplished a more brilliant and extraordinary series of original discoveries.

[*Answer objected to by Mr. Storrow as incompetent and in every way improper.*]

Q. 65. What do you think of his qualifications as a solicitor of patents?

[*Objected to by Mr. Storrow as incompetent.*]

Ans. Mr. Drawbaugh has very little book-learning. Judging from his conversation, his command of language is very little; and I should regard it as wholly inadequate to enable him to use the exact and precise terms necessary in a patent specification. As I have already testified that I heard Mr. Drawbaugh give nearly all his evidence, it is perhaps proper for me to add, that he dictated the mechanical descriptions, which appear therein, apparently with much difficulty; and that he was frequently assisted during his direct examination in the formation of his sentences, and in choosing terms of expression, by both Complainants' and Defendants' counsel, and by myself. This occurred to the greatest extent in his descriptions of the more complicated machines, "J," "H," and "P." It should be understood that this aid did in nowise extend to varying the meaning of his statements in regard to the instruments, but simply to supplying deficiencies in grammatical construction, and logical connection.

I think Mr. Drawbaugh is capable of conveying his ideas to another person, although he does it in a disjointed way, running rapidly from one subject to another; so that it is by no means easy to gather his thoughts in their logical connection. But from all I have learned from him, I do not believe that he could properly write a patent specification.

[*Defendants' counsel offers in evidence the following articles referred to by the witness in his direct examination:*

The articles from "The Manufacturer and Builder," a newspaper published in New York City, for May, 1869, *Volume* 1, *No.* 5, *pages* 129, 130.

Also an article from the "Scientific American," for Sept. 9*th*, 1876, *Volume* 35, *new series, No.* 11, *said article commencing on page* 163, *and ending on page* 164.

Defendants' counsel also states, that at one time, he thinks about July, 1880, *some of the Drawbaugh instruments, and parts of some, were photographed, and possibly one of the reproduced instruments, but whether the* *one here in evidence or not counsel does not now remember. He puts in evidence a set of these photographs, and they are marked "Exhibit Photographs;" and each sheet is marked with letters designating the instruments from which the photographs are taken.*

These photographs were taken at Washington, D. C., and are only of such instruments as happened to be down there at the time.]

Cross-examined by Mr. Storrow.

Cross-Q. 66. When did you cease to be connected with the *Scientific American*?

Ans. In July, 1878.

Cross-Q. 67. In your 21st answer, you said, that in referring to the state of the art, you did not take into consideration what Mr. Drawbaugh is alleged to have done. You also added another limitation. In view of that second limitation, I wish to know whether, in referring to the state of the art, in your testimony, you have intended to limit it to what you personally knew, or have you intended by that phrase to refer to what is generally understood by the term "state of the art," excluding Mr. Drawbaugh, of course?

Ans. I understand the term "state of the art" to mean, such information as is open to the public, either in prior patents, or printed prior publications, and possibly in the proved statements of individuals, who may have testified in courts of law, as to their own particular labors or discoveries in the art, which statements have been passed upon and accepted in judicial decisions. I do not mean to say that I knew all which any one might gather from these sources, for I had not then made, and, as I have already testified, I have not since made, a protracted examination which would doubtless be necessary to consult them all. I referred to certain apparatus, of which I had knowledge, partly derived from seeing the apparatus itself and partly from printed descriptions of the same, at the date of Bell's patent of March 7th, 1876. I did not mean to say that that was all I knew of the state of the art at that time; because I do not think that I could now specify the full extent of the knowledge I then had. I merely mentioned certain contrivances, that came uppermost in my mind, as pertinent to the subject under consideration, and of which I fully believe I had knowledge at the period mentioned.

Cross-Q. 68. You have stated in your deposition various conclusions you have arrived at; you have also stated certain experiments, tests and trials; if those conclusions are based upon any experiments, tests or trials, other than those so specified, I wish you would state what they were, and when and where they were performed?

A. Such conclusions as I have stated to be based upon trials or tests made by me, were actually founded upon the trials or tests mentioned, and not, so far as I now recall them, upon other trials or tests not referred to, and this is the idea which I intended to convey in my testimony.

Cross-Q. 69. If any of the conclusions stated, and which you did not in terms connect with any particular trials or tests, were in fact founded on or supported by any tests, trials or experiments, please state what such tests, trials or experiments were, and when and where they were made?

A. To answer that question accurately, according to the general terms in which it is framed, I shall be obliged to read the records of an enormous amount of experimenting made by the great discoverers in physical science, on which experiments were mainly founded the conclusions which they reached, many of which have been restated, both by Professor Cross and myself; and it is simply impossible for me to name all such tests or experiments, or to say when and where they were made. As I do not suppose that this is at all the intention of counsel, I trust that he will limit his question in some way, either to tests made by me, or by particular persons, in which case I shall endeavor to answer it as fully as possible.

Cross-Q. 70. Please answer the last question, limiting yourself to experiments made by you or in your presence, during the last two years?

A. I have not made any experiments, except those mentioned in my testimony, with telephones during the last two years, although I have repeatedly talked through such instruments, and incidentally remarked their efficiency, said instruments being in connection with organized systems. I have made a large number of experiments, mainly repetitions of those made by others, in order to fix electrical principles in my mind; and I suppose that these experiments have indirectly affected my conclusions. I cannot specify them all, nor their number; perhaps it will suffice to state, that they were all old and well known, and that they involved no original discovery on my part. I do not recollect having seen any experiments made by others, during the period mentioned, which have had any effect upon the conclusions I have stated.

Cross-Q. 71. If the conclusions you have stated are based upon any experiments with telephones not already mentioned, and made more than two years ago, please state what those experiments were, and when and where they were made?

A. I understand this question to be limited to experiments made by me or in my presence, as before. Perhaps it may save some further questioning in this direction if I state right here that I have neither had the time nor opportunity to enter into any elaborate series of experiments or tests with telephones at any period of my life, as I think may be easily inferred from the statements I have made as to my employment for many years back. The conclusions which I have stated to be based on an early test of Bell's telephone, made by me, I think in 1877, were based on that test and not on any other. I believe I have not mentioned, hitherto, that when I heard Professor Bell lecture in this city in 1877, I saw him then make a number of experiments with with the telephone, the results of which of course fixed themselves in my mind. I cannot now recall other experiments which I may have seen in public, though I have an impression that I did see some, but I don't think they affected any essential conclusion of mine about the telephone, formed either before or since.

Recess for lunch.

March 16th, 1882, 2 P. M.

Examination resumed.

Present same counsel.

Cross-Q. 72. You have referred to Professor Cross' testimony, and stated that you agree with some parts and disagree with others, but have not specifically pointed out the pages and paragraphs referred to. I understand, however, that you agree with him as to what takes place in a speaking telephone whilst transmitting speech; and that you agree with him as to what necessarily must take place in order that articulate speech may be transmitted; but that you disagree with him upon the question whether those things are found in Mr. Bell's first patent, and will be performed by the instruments therein described. Am I correct in that? As an illustration of my understanding, I refer you to the first paragraph of Professor Cross' answer 18, page 36.

A. I dislike to criticise counsel's questions, but the first part of this one clearly refers to theory and mode of operation, and the second part to "things" which Professor Cross finds in the apparatus; so that I am left in some doubt as to the meaning. I will endeavor however, to answer as definitely as I can, by stating that I have agreed with Professor Cross, first, in his general explanation of the theory of sound and its characteristics, including the assertion that quality is an element of sound; second, in his statement of how undulatory currents are produced in the telephone, which is right so far as it goes; third, in his opinion that no telephonic apparatus can transmit speech by electricity over a wire, unless it be based upon the use of the undulatory current of electricity, thus excluding any contrivance depending for its operation upon the "make-and-break" or interrupted current.

I do not agree with him in the opinion that there is described in Bell's patent of March 7th, 1876, in operative form, a telephone which will transmit speech through the medium of the undulatory current, either when the latter is produced by variations in the electro-motive force of, or in the resistance offered to, the current.

Referring now to the paragraph which has been specifically called to my attention, and assuming that by the instrument he mentions Professor Cross means the one represented in figure 7, of Bell's patent noted, (I assume this, subject to correction by Complainant's counsel), I find therein, as Professor Cross does, a line-wire and a battery connecting two instruments, which instruments I find by experiment, when connected with wire and battery, are not operative speaking telephones, and therefore I do not agree with Professor Cross in his statement of the functions of said instruments, or that they are in fact respectively a telephone receiver and transmitter. I agree with Professor Cross in his statement in the paragraph referred to, that the instrument which erroneously, I think, he calls a transmitter, contains a movable part which is capable of being set in vibration by the agency of the voice, but I do not agree with Professor Cross in his statement that said movable part is so arranged that it shall cause electrical variations in the current traversing the line-wire; because I have shown by experiment that it is not so arranged. If I have not answered the question as categorically as Defendant's counsel may desire, I offer to go over the whole of Professor Cross' testimony, and state my agreement or disagreement with every assertion he makes or opinion which he presents.

Cross-Q. 73. Will you now assume that in the first paragraph of his 18th answer, Professor Cross referred to a speaking telephone apparatus which you knew was operative, and not to the one which you say was

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inoperative; and state whether the paragraph, upon that assumption, would correctly describe the operation and the essential parts of the operation, which an operative speaking telephone would perform in the transmission of speech?

Ans. That assumption necessarily involves, first, the conclusion that the apparatus I am to assume is not set forth in Bell's patent of March 7th, 1876, because Professor Cross' statement, to which I am referred, particularly relates to that patent, which is mentioned in the very first words of the paragraph as the one in which he finds the apparatus operating as he describes; and second, that in conceiving such an operative apparatus I must use knowledge acquired since the date of the aforesaid patent; because, under Complainant's own showing, knowledge of an operative speaking telephone did not exist before. With the foregoing understood, I can assume a transmitting instrument suitably constructed to operate as set forth by Professor Cross; also a receiver so operating; also a battery and a line-wire, the instrument transmitting and receiving speech by the medium of the undulatory current of electricity. This, however, merely amounts to re-affirming my argument with Professor Cross, as stated in my preceding answer, and involves the addition to the apparatus shown in figure 7 of Bell's patent of March 7th, 1876, of another invention. I see no escape from the conclusion as I have stated it, as otherwise I should merely be asked to assume as operative an instrument which I knew to be inoperative, and thence to be landed in the logical absurdity of saying that Professor Cross describes an operative apparatus; because, for him to do different would be contrary to the assumption.

Cross-Q. 74. Would the instruments in ordinary commercial use, on the telephone exchange, in New York, such as the Blake transmitter and the hand telephone magneto receiver, of the "butter-stamp" form, satisfy the assumptions of your last answer?

Ans. The assumption called for in the last answer, was simply of an operative instrument; and as they are operative instruments, the Blake transmitter and the Bell "butter-stamp" telephone, would satisfy that assumption; if the assumption includes, also, the operation of the instrument, by the undulatory current, and the vibration of the diaphragm of the receiver thereby, to reproduce speech, they would still be within the assumption, but neither of the devices are made only from what is shown in Bell's patent of March 7th, 1876, and both of them are operative instruments, by reason of later inventions contained in them.

Cross-Q. 74½. I call your attention to your thirteenth question and answer, and ask you whether, in your opinion, your article in the *Scientific American* of March 31st, 1877, was suited to convey to the public intelligible information, upon the subject of the electrical transmission of speech, and the operation of the instruments therein described?

Ans. That article was based mainly upon the statements made by Mr. Bell, in his patent of January 30th, 1877, from which patent the illustrations, figure 2, 3 and 4, in said article were copied, almost in *fac simile.* The drawings of Professor Bell lecturing, were obtained from an artist correspondent, and the statements contained in the article, not derived from Bell's patent, were gathered, I think, from reports of other journals. The matter was assumed to be correct at the time, and it is not the practice in newspaper offices to require that the information they receive shall be verified by affidavit. I simply made up the article in the ordinary course of editorial work, and it was published as something of public interest, and not as opinions of mine based on my personal knowledge. If counsel means to call attention to the fact that this article sets forth Professor Bell as an inventor of the speaking telephone, and to show thereby, that I publicly stated that to be my belief, I can show him a good many later articles, where I say the same thing, on my own responsibility, and not on the responsibility of the *Scientific American*, because I always supposed Professor Bell was the first inventor of the speaking telephone, until I found out, during the progress of this suit, what Drawbaugh had done in the same line.

[*Reference to Mr. Drawbaugh is objected to by Mr. Storrow, as improper to come from an expert.*]

Cross-Q. 75. Was that article suited to convey to the public a substantially intelligible idea of the operations which take place in the electrical transmission of speech, and of the operation of the instruments therein described?

Ans. It was intended to, and does in fact, give only a general idea of the subject, which is right enough, so far as it goes. The details of the instrument are not described with any particularity, nor is the influence of the several parts of the instrument upon its operation fully stated. Besides, I remember now, that the instrument was sent to the office, strapped up in a box, as represented in the picture, with a request that it should not be opened, and that is why the Patent Office drawings were copied, and the engravings of the inclosed instrument, not directly made from the instrument itself; and this fact, of course, although I could determine the presence of many parts in the instrument, to be as shown in the patent, prevented my giving as graphic a description of it as I might otherwise, perhaps have done.

[*Complainants' counsel puts in evidence said article, to be marked* "*Park Benjamin's Scientific American article, March* 31, 1877."

Cross-Q. 76. You have spoken, in your 15th answer, and in a number of other places, of the "undulatory current," with reference to the action of the speaking telephone. I understand from Professor Cross' testimony, that for the purpose of transmitting articulation or quality, it is necessary, not only that the current should be undulatory, as distinguished from intermittent, but that the electrical undulations should correspond in their form to the aerial undulations or vibrations, which constitute the sound to be transmitted. Do you, or do you not, agree with him in that respect, and have you intended to use the phrase in that sense, when referring to the electrical transmission of speech, by such a current?

Ans. As I understand the question, I agree with Professor Cross, in the statement therein; and I have used the phrase in the sense indicated.

Cross-Q. 77. Near the end of your 16th answer, in summing up your conclusions, you say; "I do not find, for the reasons stated, in Bell's patent of March 7th, 1876, a speaking telephone, either directly or by inference from the language used, or from the drawings." Do you mean to be understood as saying, that from merely reading the patent, and without knowing from actual trial, whether the instruments therein described are, or are not, practically operative, you have come to the conclusion that no electric speaking telephone is there set forth?

Ans. I continue the quotation, from the point where the counsel left off; "And I have determined to my satisfaction, by actual test, that the specific apparatus, which the Complainant has sought to prove, as a speaking telephone, is wholly inoperative as such;" and I emphatically protest against the counsel carving out pieces of sentences from my testimony, and attempting to mislead the Court, by giving them a signification completely negatived by the immediate context. The sentence which I complete, in answer, is quoted from my long reply, setting forth what I find in Bell's patent of March 7, 1876. I gave in that reply all my reasons for the conclusions reached; and I stated in conclusion, that I based my opinion apparently on all the foundation on which an opinion could be based, namely; the language of the specification, the drawings, and the actual test of the instrument; and I don't think I have anywhere given it to be understood, that I have allowed myself to be influenced, other than by fair consideration of all three of these means of knowledge.

[*Answer objected to by Mr. Storrow, as irresponsive and improper.*]

Cross-Q. 78. Have you meant to express the opinion, or have you expressed the opinion, in your deposition, that examining the specification and drawings, of that patent alone, would properly lead an expert to the conclusion, that no electrical speaking telephone is therein set forth?

Ans. I have said, and I still say, that Bell's patent of March 7th, 1876, specification and drawings, do not, in my belief, describe an operative electrical speaking telephone. That conclusion, I think, can be fairly reached from the specifications and drawings. But as against this conclusion, I have the opposite statement of Prof. Cross before me. Desiring to give that witness' statements all the weight possible, and at the same time to test the accuracy of my own conclusion in the matter, I had an apparatus made, fairly and honestly, in accordance with what is set forth in figure 7, of Bell's patent. The result of the experiment with this instrument, was not only to confirm my conclusions, but also to prove to me that Mr. Bell had not even indicated in his patent how to make an operative speaking telephone. And thus, taking the results of my test, and all that is set forth in the patent, together, as I have intended these matters should be taken, I fail to see how, under the broadest construction that can be given to his patent, Mr. Bell can be considered to have described an operative speaking telephone therein.

Cross-Q. 79. I understand from your last answer, that the reason why you think that patent does not set forth an electric speaking telephone is, because you think that instruments constructed as therein described could not transmit speech, and that you form that opinion, first, from examining the specifications and drawings, with your knowledge as an expert; and second, from actual tests or trial with the instruments you have produced. Is my understanding correct, and if not, please state wherein it is wrong?

Ans. It is right, so far as it goes; but all the reasons influencing me on the subject have been fully set out by me in my direct testimony, and notably, in answer to question 16.

Cross-Q. 80. Suppose you had found on trial, that instruments made according to the specification and drawing did transmit speech, what conclusion should you then have arrived at, as to whether that patent did, or did not set forth the invention of a speaking telephone?

Ans. If I found that an instrument made in accordance with what is set forth in that patent was, in fact, an operative speaking telephone, then I think it would be for the Court to say whether the description of the patent was legally sufficient. It would be one of those cases, I think, closely analogous to that in which a new use is discovered for a patented apparatus, never thought of by the inventor, and not specifically stated in his patent, but which he would nevertheless be entitled to the benefit of.

Adjourned until Monday, March 20th, 1882, at half-past ten, A. M.

March 20th, 1882, 11, A. M.

Examination resumed, pursuant to adjournment.

Present, Mr. Storrow for Complainants, and Mr. Hill for Respondents.

Cross-examination of Mr. Park Benjamin by Mr. Hill continued.

Cross-Q. 81. Did you write an article in the *Scientific American* of October 6th, 1877, volume 37, pages 207 and 212, relating to the telephone; and, if so, state whether that was suited to convey a correct and intelligible idea to the public, so far as it went?

Ans. I don't think I wrote that article.

Cross-Q. 82. Do you think that article suited to convey a correct and intelligible idea to the public, so far as it went?

Ans. Yes; I think so.

Cross-Q. 83. In your twenty-second answer, you briefly summarize your opinion of the improvement set forth in Mr. Bell's first patent, March 7, 1876, and of the further improvement contained in the invention patented by his second patent, January 30, 1877. I understand you to say therein that the most important difference between them is, that, in your opinion, the second patent tells the community how to make an electric speaking telephone, and the first does not; do I understand you correctly in these respects?

Ans. The second patent describes an operative speaking telephone, and the first does not.

Cross-Q. 84. Will you tell me what is the difference in the construction of the instruments described in these two patents, respectively, which makes the one described in the second patent an operative speaking telephone, and leaves the one described in the first patent, in your opinion, not an operative speaking telephone?

Ans. I understand from the question, that I am to explain, first, why Bell's first device is, in my opinion, inoperative; and then show why the second device is operative, and point out the differences which lead to that result. I have already given my reasons with regard to the inoperativeness of the device shown in Bell's patent of March 7th, 1876, based, as I have already stated in this cross examination, on my study of the patent, and on the tests I have made. These reasons I need not now repeat; but, as under the question, I think it necessary for me to state all the reasons which I have for regarding the device shown in Bell's patent of March 7th, 1876, as inoperative, I have now to mention some which I have not before stated.

It is proper for me to explain here that, in view of the assumptions which I have been called upon to make during this cross-examination, to the effect that Bell's device of March 7th, 1876, is an operative contrivance, I have been led, during the late adjournment, carefully to examine the testimony of Professor Bell and Mr. T. A. Watson, stipulated into this suit, in order to discover whether I could find anything therein which would afford a substantial basis for the assumptions before referred to. I had looked over this testimony before, in order to seek out its affirmance or disaffirmance regarding other considerations which have occurred to me, but this was the first time that I had carefully examined it fully, in order to see what Professor Bell thought of the contrivance which he represented in his earlier patent. Professor Bell, in his answer to the 71st interrogatory, describes certain experiments made on June 2nd, 1875, in which he found, as he states in a letter of that date, written by him to Mr. G. G. Hubbard, and quoted by him in answer to interrogatory 7th, that he could transmit signals without any battery whatever, and that, "the musical note produced at the receiving end was sensibly the equivalent of that at the transmitting end, in *loudness* as well pitch." The italics are Professor Bell's. On the same date, as he says in his answer to the 74th interrogatory, he instructed Mr. Watson to make a membrane instrument; and Mr. Watson says, in his deposition in the interference, which has been put in evidence by Complainants', in answer to interrogatory 8, that the instrument he made according to said direction, is shown in the engraving embodied in his answer, which engraving is the same as that representing "Complainants' exhibit No. 31, Bell's Telephone of 1875."

On July 1st, 1876, Professor Bell, in answer to his 84th interrogatory, says that he ordered a second membrane telephone constructed, a duplicate of which he produces, which is marked "Complainants' exhibit No. 34." In his answer to interrogatory 20, Mr. T. A. Watson, who furnished these two instruments, says as follows: "They are duplicates with the following exceptions: In exhibit 31 the wooden framework is a little heavier, and the armature not so thick. In exhibit 34 the framework is heavier, armature thinner, and a different method for adjusting the differences between the pole of the magnet and armature is supplied. In the original the adjustment was made by sliding the crossbar that supported the magnet up and down in the slots in the sides, as in exhibit 31."

After testing these instruments, Professor Bell says, in his answer to interrogatory 92, that the "experiments demonstrated the practicability of transmitting articulate speech by instruments having the same mode of operation as these stretched membrane instruments," and that it was only necessary to make further experiments, to ascertain the best arrangement of the parts; and from the account of the test, given by Mr. Bell in his answer to the 90th interrogatory, I do not find it stated that articulate speech was heard through the apparatus, but that Mr. Watson had stated, that he (Watson) had heard Bell speaking, but could not make out what he said.

In his answer to the 94th interrogatory, Professor Bell sets forth a letter written by him, wherein he states what he wants to protect in his patent, and speaking apparently of the transmission of speech as something to be done in the future.

So far as I, therefore, have been able to learn from Mr. Bell's testimony, he had now constructed two instruments, a receiver and a transmitter, through which Mr. Watson had stated that he had heard the sound of the human voice. Mr. Watson himself on this point, in answer to the 13th and 15th interrogatories, says that with the membrane telephone alone as a transmitter he could hear a faint sound; that with the two membrane telephones the results were a slight improvement, but that his "recollection of this experiment is confused with those that precede." In September, 1875, Mr. Bell, it appears, went to Canada, and while there he made a drawing which is put in evidence by Complainants in this case, "Exhibit 37, Bell's Toronto Drawing," and in answer to the 129th interrogatory, Professor Bell swears, that the paper shows "the invention and apparatus described in my United States patent dated March 7th, 1876." In answer to the 126th interrogatory, he says that he made the drawing on the 28th day of December, 1875. In this drawing I find a sketch representing an apparatus, such as is shown in figure 7 of Bell's patent of March 7th, 1876, beneath which is written the following: "First attempt to transmit the human voice. The varying pitch of the voice could be discriminated, but not the quality. A sort of muttering effect was perceived at the receiving end when a person talked very loudly at the other end."

In his answer to the 101st interrogatory Mr. Bell says that he began to prepare the specification of his patent of March 7th, 1876, in September, 1875, and produces sheets containing rough drafts, made in October. So that this statement on the Toronto drawing was apparently penned by him after he had drawn his specification. I have already pointed out, in my direct testimony, that in the drafts of claims referred to by Mr. Bell in answer to the 103rd interrogatory, are claims for transmitting sounds differing in *timbre*, as well as pitch and loudness, which claims do not appear in Bell's patent of March 7th, 1876.

Finally, with regard to the specification which he did prepare, he says in answer to the 115th interrogatory, that on the 18th of January, 1876, after he had sent his specification to a solicitor in Washington, he wrote a letter in which he quotes Mr. Hubbard as being pleased with that specification, and as stating that, "it promises to be of great value if I (Bell) *prosecute my researches diligently*; if not, others may supplant me." The italics are Professor Bell's. The conclusion which I reach from all the foregoing, I think, entirely confirms the conclusion I have already attained in a wholly different way. I said that I believed that Professor Bell had left out reference to transmission of quality of sound in his patent of March 7th, 1876, purposely; and this is confirmed by Professor Bell's own statement, on the Toronto drawing, that the only apparatus, shown in that patent, which Professor Cross says will transmit quality, will in fact not do it. It is also confirmed by the fact of Bell's having made this statement after drafting the claims for his patent, as he quotes them, said claims including some for the transmission of quality, which claims he omitted in his specification of a patent signed twenty-two days after making the Toronto drawing, which specification, two days before he signed it, he thought described an invention which promised "to be of great value," if he prosecuted his "researches diligently."

Referring now once more to Bell's two membrane instruments, Complainants' exhibits 31 and 34, which, in their original form, do not, so far as I can discover, appear to have transmitted articulate speech, although in their reproduced form some results of the sort seem to have been reached, the consideration of these in comparison with what is shown in figure 7 brings me directly to the comparison between Bell's two devices, and to pointing out the differences called for by the question. I have already quoted Mr. Watson's answer with regard to these two instruments, from which it will be seen that both of them are provided with means for adjusting the relative distance between magnet and armature; whereas, I have already pointed out that no such means are described or suggested in Bell's patent of March 7th, 1876, and that the same are claimed as an original invention by Bell in his patent of January 30th, 1877. I have already dwelt quite fully on the importance of this contrivance, as affecting the practical operation of a speaking telephone, and it now appears that Mr. Bell both knew of it and used it long before the date of his first patent. There was nothing to have prevented him indicating it in that patent, that I can discover, unless he considered, as he has sworn that he does, that in a system of multiple harmonic telegraphy, transmission of quality as well as pitch is of no advantage whatever, and hence that it was perfectly open to him to leave out a device which mainly tended towards the operativeness of the instrument as a transmitter of quality. The absence of the adjusting device from the contrivance shown in the patent of March 7th, 1876, and its presence in the contrivance shown in the patent of January 30th, 1877, is one difference which renders the latter operative while the former is not. In the instrument shown in the patent of March 7th, 1876, the armature is hinged to the uncovered leg of the magnet, and connected in some unknown way to the centre of the diaphragm. This arrangement doesn't appear to have proved satisfactory, especially with a heavy armature; and at all events, in the lecture delivered before the Society of Telegraphic Engineers by Professor Bell, in October, 1877, and referred to by him in answers to interrogatories 174 to 180, he says, that with the two membrane telephones, complainants' exhibits 31 and 34, the results were only "partially successful," and that he determined to reduce the size and weight of the spring as much as possible. For this purpose, he says: "I glued a piece of clock-spring, about the size and shape of my thumb-nail, firmly to the centre of the diaphragm," and after this he was "enabled to obtain distinctly audible effects." In answer to the 180th interrogatory, however, Professor Bell says that he applied this clock-spring after the granting of his patent of March 7th, 1876.

Recess for lunch.

March 20, 1882, 2, P. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Cross-examination of Mr. Park Benjamin by Mr. Storrow continued:

[*Witness continues.*] The adoption of the thin piece of clock-spring glued to the centre of the membrane seems to have been the first step in the advance which was consummated in the adoption of a metallic plate. By the use of that plate Bell was enabled to suppress the separate armature and membrane, and by employing a substance unaffected by moisture and not liable to swell and become loosened, as does membrane under the influence of the breath, thereby, for this reason as well as for others already mentioned, he constructed an apparatus in a much more operative form. The use of this plate is the second point of difference between the two devices named in the question. The employment of the permanent magnet in the later device also tends to make it a more operative machine than the earlier contrivance, in which no permanent magnet was embodied.

And finally, in the device shown in the patent of January 30th, 1877, are combined a number of instrumentalities, not combined in like manner in the earlier device, the special arrangement of which tends to make the instrument more operative and better adapted for practical use.

[*Complainants' counsel objects, that an argument, which is attempted to be founded on the evidence, and which has been prepared in the manner and at the time stated in the answer, was not called for by the question.*

Defendants' counsel calls attention to the fact that the so-called argument is merely a series of qoutations from the testimony of Complainants' two principal witnesses, Mr. Bell and Mr. Watson, tending to show what *was and what was not, accomplished, as a matter of fact, by the instruments referred to in the question, and enabling him not only to indicate more clearly why the instruments shown in figure 7 of Bell's first patent would not operate for the transmission of articulate speech, but also enabling him to point out more clearly what the changes were that enabled it to transmit speech, and that they were made after the date of the first patent, and therefore were necessarily included in the second patent, all of which Defendants' counsel submits comes within the proper scope of an answer to the question.*

Complainants' counsel objects, that the arguments of counsel cannot properly form part of the record of the evidence in the case.]

Cross-Q. 85. I call your attention to the two instruments which you have produced, and which are marked "Defendants' Exhibit Bell Telephone, 1876 Patent." Will you please measure, as carefully as you can, and tell me the distance between the centre of the core of each electromagnet and the centre of the armature?

Ans. The distance is about one-eighth of an inch in the receiver, and about three thirty-seconds in the transmitter, as the instruments now are.

Cross-Q. 86. Are they different from what they were when you used them, in this respect?

Ans. No; the instruments are in the same condition as when I used them, except that the studs have become detached from the membrane, and possibly more fastening cement may remain in one instrument than in another. I merely mention this because it may tend to account, possibly, for the difference in the measurement of the distances mentioned.

Cross-Q. 87. Will you please measure and state the length, breadth and thickness of each armature?

Ans. Length, one and a half inches in both; thickness, three thirty-seconds inches; width, a half inch in both.

Cross-Q. 88. Please state what passages of the testimony of Professor Bell and Professor Cross you referred to in your 62d answer?

Ans. For Mr. Bell's statement that quality is resolvable into the elements of loudness and pitch, see his answers to interrogatories 63 and 64, and his statement in his affidavit on page 19 of Complainants' moving papers, directly to this effect.

I understand Professor Cross to refer to quality as an element, in his affidavit in Complainants' moving papers, page 34, at top of page; also in his testimony, page 30, in answer to interrogatory 9. Professor Cross' statement quoted in my answer, and having reference to the very slight variations between the sound waves of inarticulate and articulate speech, is taken from his affidavit in Complainants' moving papers, page 27.

The statement that the instrument shown at A, figure 7, is a most essential mechanical modification of A, figure 5, but by reason of the entire change of structure from figure 7, it has become capable of transmitting vocal sounds of all kinds, including articulate speech, appears at the bottom of page 35, Professor Cross' affidavit in Complainants' moving papers for a preliminary injunction. Professor Cross' statement to the effect that pitch, quality and loudness are different things will be found chiefly in his answer to interrogatory 6, in his testimony, page 23, in which occurs the following paragraph:

"I have used the term 'quality or *timbre;*' quality is that peculiarity of a sound by which, independently of its pitch or loudness, we are enabled to determine the instrument by which the sound is produced; thus, for example, the note of a violin differs from the note of a flute in quality, even though the two are the same in pitch and loudness."

I believe these are all the statements of Professors Bell and Cross to which I have referred in the answer. I should have given the sources from which I derived them, while making that answer, if I had supposed that I would be charged with misrepresenting, as I afterwards was, by Complainants' counsel.

Cross-Q. 89. Will you please point out the sentences referred to in your last answer, either by reading them to the Examiner so that he can take them down, or by indicating the first and last words, or otherwise?

Ans. Read in connection with all of the answers to interrogatories 63 and 64 this sentence from Mr. Bell's letter of May 4th, 1875, as follows: "If this turns out to be the case, the oscillations of the current should correspond in amplitude, as well as in the rate of movement, to the vibrations of the string. One consequence would be that the *timbre* of a sound could be transmitted." Read also in this connection the following sentence from Bell's affidavit, page 19 of Complainants' moving papers: "Before this time I had perfectly satisfied myself that the true and only method for the telegraph is transmission of vocal sounds involved as its fundamental element, an apparatus which should transmit amplitude or intensity as well as pitch—for "quality," or *tim-*

bre, or articulation were ultimately resolvable into these two characteristics of vibration, &c., to be transmitted."

Professor Cross uses the word "elements" in the following sentence, page 30, of his testimony: "The entire 'form' or character of this curve can be determined and controlled, as already stated, by determining, or controlling for each point the length of the abscissa and of the ordinate for that point, or in other words, determining, or controlling the elements of time or frequency, amplitude or intensity, and direction; but it is obvious that it will require very many measurements of abscissas and ordinates to determine or control the 'form' of each complete set of vibrations." The language in the affidavit and testimony is the same. The reference to page 27 of Professor Cross' affidavit is fully quoted in my 62d direct answer. The reference to page 35, Professor Cross' affidavit, has been fully quoted in my direct testimony.

Cross-Q. 90. In the second paragraph of your 62d answer you say: "It will be found, I think, in Professor Cross' testimony, that he himself speaks of quality as an 'element' of sound, and as the word element simply means something that cannot be resolved into constituent parts, his very use of the term negatives the idea of its resolution." Will you please point out the passage in Professor Cross' testimony where he applies the term "element" to quality?

A. I have already quoted from Professor Cross as speaking of the "elements of time or frequency, amplitude or intensity, and direction." Read this in connection with what he states in his testimony, pages 22 and 23, especially at the top of page 23, and it seems to me to follow, as a matter of course, that for the words "time or frequency" the word "pitch" can be substituted; for the words "amplitude or intensity" the word "loudness" can be inserted; and the word "direction" similarly may be replaced by the word "quality." If that is not the logical meaning of what he says, I fail to understand what is, and I would be glad to consider any other signification which counsel may suggest.

Cross-Q. 91. In the passage which I have quoted from your 62d answer you say that Professor Cross "himself speaks of quality as an 'element' of sound," and you draw a conclusion from what you style "his very use of the term element." What I would like to have you do would be to point out and read the sentence in which he speaks of "quality" as an "element"?

A. In his answer to the 9th interrogatory Professor Cross produces a curve, which he says represents the motion of a particle under the influence of sound-waves; and he uses the word "element" in the following sentence: "The entire form or character of this curve can be determined and controlled, as already stated, by determining or controlling for each point the length of the abscissa and of the ordinate for that point, or in other words, determining or controlling the elements of time or frequency, amplitude or intensity, and direction; but it is obvious that it will require very many measurements of abscissas and ordinates to determine or control the 'form' of each complete set of vibrations." This is the sentence referred to in my previous answer.

Cross-Q. 92. In that sentence Professor Cross applies the word "element" to time or frequency, to amplitude or intensity, and direction; I wish you would point out where you find "his very use of the term '*element*' as applied to *quality*, because in your 62d answer you seem to attach some importance to the use which you said he made of that term, as applied to quality.

A. As I said in a preceding answer, the word "direction" in the foregoing quotation I think may be replaced by the word "quality;" and as to the importance which I applied to Professor Cross' statement in that respect, I am not aware that I stated that I regarded it of any special import, other than as corroborating what I take to be the general tenor of meaning of his statements with regard to the matter.

Cross-Q. 93. I wish you would read any passage from Professor Cross' testimony, wherein you find the words "element" and "quality" in the same sentence?

A. I have never said nor insinuated that the words "element" and "quality" were in the same sentence, and counsel knows it perfectly well. I have endeavored to give what I understand to be Professor Cross' meaning, and I have also stated fully the grounds of my understanding. If the counsel proposes to bar out all inferences in this case, and require specific statements for every fact, then he renders it certain that the speaking telephone is not described in Bell's patent of March 7th, 1876, because there is no statement whatever in that patent that any instrument there shown is capable of transmitting articulate speech.

[*Answer objected to by Mr. Storrow as not responsive.*]

Cross-Q. 94. Can you, in point of fact, find any sentence in Mr. Cross' testimony which contains both those two words, "element" and "quality"?

A. It would be just as reasonable to ask me whether I could find in Professor Cross' testimony two words in the same sentence in the Koptic language. I haven't said I could do this; neither have I said that I could find the words "element" and "quality" in the same sentence; and I can't.

[*All the answer, except the last two words, objected to by Mr. Storrow as irresponsive.*]

Cross-Q. 95. In the first paragraph of your 62d answer, you referred to a statement which you said will be found on page 19 of Mr. Bell's affidavit, and also, you believe, in his testimony. In the same paragraph you said: "Looked at in this way, it will be seen that Mr. Bell's statement, made long after he had obtained his patent of March, 1876, might easily be twisted into a bearing on this case, which would lead the Court astray, even if that object were wholly unintentional." I suppose when you so testified you did not remember that one of the passages in his testimony, which you have since referred to in this connection, and the only part of his deposition which you have specifically quoted in this connection, is found in his letter of May, 1875, which letter constitutes the whole of his 63d answer, did you?

Ans. That question involves a singular distortion of facts, owing to some lapse of memory, I fear, now on the part of counsel. It is not true, that the only part of Mr. Bell's statements that I have specifically quoted is taken from his letter of May 4th, 1875. On the contrary, in my answer to cross-question 89, will be found quoted in full, a sentence taken from the body of Mr. Bell's affidavit, embodying the specific statement of what I take to be his opinion, in the words, "for, 'quality' or *timbre* or articulation were ultimately resolvable into these two characteristics of vibration." That affidavit appears to have been sworn to by Mr. Bell on the sixth of September, 1880.

Cross-Q. 96. Did you not observe, when the preceding question was read, that it carefully stated that the passage from the letter was the only passage specifically quoted in this connection from Mr. Bell's deposition?

Ans. Certainly I did, and the other passage, to which I referred in my answer, was also quoted from a deposition of Mr. Bell, made in this case. In fact, the last deposition appears to have been made in this particular case, while the other one appears to have been taken in some other case and stipulated into this one. In my previous answers I refer to both of the depositions indifferently, assuming that both set forth Mr. Bell's sworn statements. If counsel desires me to restrict myself to the consideration of either one of them, it would avoid ambiguity if he would state the fact definitely in his question.

Cross-Q. 97. Have not both you, and counsel in this case, in taking your deposition, distinguished between the preliminary affidavits, and the testimony specially introduced for final hearing; by styling one "affidavit" and the other "deposition" or "testimony;" and did you not apply this very distinction to Mr. Bell, in the first paragraph of your 62nd answer, which was referred to in my question?

Ans. It is very likely we did, and that is just what I am trying to get counsel to do. The affidavits are, I think, rather more full than the depositions in the *prima facie* case—contain statements at length that the depositions do not so contain. I have endeavored usually to distinguish between them, by speaking of the affidavits as forming part of Complainants' moving papers for a preliminary injunction, and of the testimony as taken in Complainants' *prima facie* case. Counsel in his question merely spoke of "depositions," which I understood to mean all the testimony of Professor Bell, whether contained in one place or another.

Cross-Q. 98. Has the word "deposition" been applied to describe the affidavits, either by yourself or by counsel, in any answer or question in your deposition?

Ans. I am sure I don't remember. I may have used it, and I may not; if I did, the use was inadvertent on my part, for I generally meant to describe the affidavit in the terms already stated. I don't see what this has got to do with the understanding which I formed of counsel's question, which I have now fully explained, and which, if he thinks it was erroneous, he could easily correct by a word or two.

Cross-Q. 99. When you gave that part of your testimony, which is set down in the first paragraph of your 62nd answer, did you in fact have in your mind the letter of May 4th, 1875, which constitutes Mr. Bell's 63rd answer?

Ans. I cannot say that I did. I simply meant to say that Mr. Bell had made such and such a statement in his testimony. Of course I had seen the statement in the letter, but in my answer, as stated, I had reference merely to the fact itself, and not to the form in which it appeared.

Adjourned until March 21st, 1882, at half-past ten o'clock, A. M.

March 21st, 1882, 10.30 o'clock, A. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Cross-examination of Mr. Park Benjamin by Mr. Storrow continued:

Cross-Q. 100. In your 90th and 92d answers you allude to two passages of Professor Cross' testimony, and say, in substance, as I understand you, that the word "direction" in one of the passages which you quote may be replaced by the word "quality"; "time or frequency" may be replaced by the word "pitch"; "amplitude or intensity" may be replaced by the word "loudness." Do you think that those three sets of words are so far correlative in acoustics that the one can be replaced by the other in such statements as those in Professor Cross' deposition, which you have quoted or referred to in those answers?

Ans. My basis for the substitution noted in the question is Professor Cross' own use of the words "direction," "amplitude" and "frequency." Thus he says on pages 28 and 29 of his affidavit in Complainants' motion papers for a preliminary injunction, "What is needed, therefore, is that the transmitting instrument, moved by the voice of the speaker, shall control, at every instant and without any interruption, the direction of change, the amplitude or violence of change and the frequency of change in the current, and thus make these conform to the varying changes of motion in the air particles due to the voice of the speaker. These three kinds of change—in direction, in amplitude, and in frequency—cover all the variations of motion and all the variations of current strength involved." Variations in direction, variations in amplitude, and variations in frequency, result in variations in quality, loudness and pitch.

Cross-Q. 101. Will you please to examine Professor Cross' 6th answer, and state what paragraphs or what sentences in that you think are correct, and what paragraphs or what sentences you think are wrong, indicating them in such a way as may be most brief and convenient.?

Ans. I do not now notice any error in the answer from the beginning down through that paragraph ending with the words "desired sound at will." I disagree with all the rest of the answer, so far as it relates to Bell's patent No. 174,465, March 7th, 1876. I agree with the last four paragraphs of the answer, beginning with the words "no form of transmitter."

Cross-Q. 102. I observe that you limit your disagreement with him as to part of his answer, by the phrase, "so far as it relates to Bell's patent of March 7th, 1876." I infer from that limitation that you agree with him that a true and operative speaking telephone apparatus would act as he states in the passages referred to, but that you think that the apparatus described in Mr. Bell's said patent is not an operative speaking telephone, and will not so act. Do you intend to make a distinction of such a character?

Ans. I think that idea is correct.

Cross-Q. 103. Not far from the middle of your 16th answer, and as part of the statement of your opinion about Mr. Bell's first patent, I find this clause: "If the instrument was not capable of transmitting articulate speech before the cone and membrane were added, it certainly could not do so by their aid;" do you think that a correct statement?

Ans. Yes, sir; I do.

Cross-Q. 104. In the last paragraph of your 12th answer you speak of using in the fall of 1877, two small hand Bell telephones, in the ordinary well-known form, which were sent to the office of the *Scientific American* for examination. Are those the instruments which are figured in the *Scientific American* article of October, 1877?

Ans. I cannot say; my impression is that I had the instruments later than that date.

[*Complainants' counsel puts in evidence the said article, to be marked "Complainants' Exhibit Scientific American, article of October 6th,* 1877."]

Cross-Q. 105. You have spoken of the various trials you have made with the exhibits which have been put in evidence as Drawbaugh's instruments or as reproductions of instruments made by him; on what days did those tests take place, and what instruments did you test upon each day?

Ans. On referring to memoranda made at the time, in order to refresh my memory, I find that the tests were made on the following dates, and as follows: November 29th, 1881, instruments "A" and "D"; November 30th, instruments "D" and "E," "H," "A," "C," "I" and "F"; December 1st, instruments "D" and "E," "G," "O," "L," "M," "P," and "B"; December 14th, instruments "B" and "F." Some of these instruments were reproductions, as I have already stated.

Cross-Q. 106. What low conductor did you use in "F reproduced"?

Ans. A black powder, evidently carbonaceous, supplied to me by Mr. Drawbaugh, who put it in the instrument in my presence, and who informed me that it was, I think, pulverized gas-carbon mixed with charcoal or plumbago.

Cross-Q. 107. How fine was it?

Ans. It seemed to be a very fine powder, perhaps as fine as flour.

Cross-Q. 108. How thick a layer of it was there in the cup of the instrument when you used it?

Ans. It very nearly filled the cup, the upper plate resting on the powder, the plate being a little below the rim of the cup. I saw Mr. Drawbaugh put the powder into the cup, which he lowered down for the purpose. He filled the cup nearly full and then levelled the powder carefully on top; then he raised the cup, so that the surface of the powder came in contact with the plate; and then the plate was, as I have stated, apparently a trifle below the edge of the cup. The thickness of powder then was about a quarter of an inch. In adjusting the instrument the cup is, of course, somewhat raised or lowered; so that it is scarcely possible to state the exact position of the plate with reference to it. I think, however, the foregoing is substantially correct.

Cross-Q. 109. Will you please state, if you can, the electrical resistance of the various pieces of apparatus which you tried on those days and have testified about?

Ans. I cannot for the following reasons: first, because I wasn't asked to measure it; second, because there was no apparatus there to do it with, if I had been asked; third, because I wouldn't have done it anyhow, because I was testing simply to find out whether speech could be transmitted through the apparatus, and not to determine its electrical resistance.

[*Complainants' counsel now requests Defendants' counsel to cause the tests of the instruments "F reproduced," "B reproduced," "C reproduced," "I reproduced" and "A" to be repeated in New York in the presence of such persons as the Complainants may ask to attend, and request him to name a day for that purpose as early as may be convenient.*

Defendants' counsel replies that said instruments are all here in charge of the examiner, and the Defendants' expert, Mr. Benjamin, is in the hands of Complainants' counsel under cross-examination, and Complainants' counsel are at liberty to arrange for any test they desire, at any place in New York City, or time, and in the presence of any people they may elect; provided only that the Defendants' counsel and expert have opportunity to attend, and that the Examiner attend and retain control of the instruments.

Complainants' counsel now makes of the witness the same request just *made of Defendants' counsel; and Complainants' counsel states that in all other respects the cross-examination is now closed.*

Witness states that he will be glad to oblige Complainants' counsel in any way, but he will do whatever he is directed to do by Defendants' counsel.

Defendants' counsel directs the witness to do as Complainants' counsel requests, and states that Defendants will pay him all charges and expenditures in that behalf.

Counsel agree that the tests be made here in Mr. Benjamin's office, on Thursday, March 23rd, 1882, at eleven o'clock A. M., to which time and place the session is adjourned.]

THURSDAY, *March 23rd*, 1882.

By consent continued until Tuesday, March 28th, 1882, at eleven o'clock A. M.

March 28th, 1882, 11 *o'clock* A. M.

Examination resumed pursuant to adjournment, the place of meeting having been changed to No. 4 East 14th street, New York City, at the office of The People's Telephone Company, and private office of Mr. Marx.

Present Mr. Smith and Mr. Storrow for Complainants, and with them Messrs. Charles R. Cross, F. L. Pope, W. W. Jacques, Frank W. Smith, Arthur W. Wright; Mr. Hill for respondents, and with him Messrs. Park Benjamin, Daniel Drawbaugh, Marcus Marx, Ernest Marx, B. C. Paddock and S. Chamberline.

The morning was occupied in tests of various Drawbaugh telephone instruments.

Recess for lunch from 2 to 3 o'clock P. M.

The tests were continued in the afternoon, the same persons being present, and also Mr. August H. Girard, invited by Respondents' counsel, and Mr. Ernest H. Rydall, stenographer for Complainants' counsel.

The tests occupied the entire afternoon.

Adjourned at 7 P. M., until March 29th, 1882, at 11 o'clock, A. M.

March 29, 1882, 11 o'clock, A. M.

Examination resumed pursuant to adjournment.

Present Mr. Storrow for Complainants, and Mr. Hill for Respondents; also Messrs. W. W. Jacques, Frank Smith, F. L. Pope and Ernest Rydall, stenographer, on behalf of Complainants, and Messrs. Park Benjamin, Daniel Drawbaugh, Marcus Marx, Ernest Marx, George H. Benjamin, F. A. Klemm, S. Chamberline and Patrick Donahoe, stenographer, on behalf of Respondents.

The morning was consumed in tests of instruments.

Recess for lunch from 1.30 to 2.30 o'clock, P. M.

The tests were continued in the afternoon in the presence of the above named persons.

The tests occupied the whole afternoon.

Adjourned at half-past six o'clock, P. M., until March 30th, 1882, at 11 o'clock, A. M.

March 30*th*, 1882, 11.15 A. M.

Examination resumed pursuant to adjournment.

Present Mr. Smith and Mr. Storrow for Complainants, and Mr. Hill for Respondents; also, Messrs. Jacques, Pope, F. Smith, and Rydall, on behalf of Complainants, and Messrs. Girard, Paddock, Benjamin, Drawbaugh, Marcus Marx, Ernest Marx, and Patrick Donahoe, on behalf of Respondents.

Morning occupied in tests.

Recess for lunch from 2 to 3.30 P. M.

Examination resumed after lunch.

Present Mr. Storrow for Complainants, and Mr. Hill for Respondents.

Cross-examination of Mr. Park Benjamin by Mr. Storrow continued.

Cross-Q. 110. The record shows that since the last question I asked you, on the 21st of March, various tests have been made at the office of The People's Telephone Company, and the private office of Mr. Marcus Marx, in the building No. 4 East 14th street, New York City; will you please describe the arrangement of the rooms and places, and the lines of wires used in these tests?

Ans. The rooms between which the line was run are located respectively in the front and back of the building No. 4 East 14th street, a long hall or passage way extending between them. The depth of the building, between front and rear walls, is, I am informed, eighty-four feet. The front room was used chiefly as a receiving room, and the rear one as a transmitting room. A double line of wire, forming a metallic circuit, was led between these rooms, terminating at one end at the rear wall of the rear room, and passing into a closet in the front room. Upon this line most of the tests were made. Its total length, I think, was something over one hundred feet. A second line of wire was also led between the two rooms, and connected with the gas fixtures in each, so as to complete a metallic circuit through the wire, and gas pipes of the house. This line was used for general communication between the two rooms, such as reporting results, &c., and served as a means of verifying, in some cases, the messages transmitted by the other line. To this second line, which I shall call for convenience the "tell-tale line," were attached two Bell magneto-telephones of the ordinary "butter-stamp" form, these instruments being provided by Complainants. When the doors of the rooms were closed it was not possible to hear speech between them passing through the air; and when the person receiving the sentences, words, &c., shut himself up in the closet in the front room, the noise of the street was, in a large measure, cut off. Care was taken to check, as much as possible, noises occurring in the rooms, due to the speaking or moving about of persons in them, and although it was scarcely possible to obtain such a degree of quiet as was had during previous tests to which I have referred, the conditions in this regard were perhaps as favorable as could be had in a building located on a city business street.

Cross-Q. 111. Please state who did the listening, or most of the listening, at the receiving end, during the tests on these three days?

Ans. I did most of the listening. Professor Cross and Mr. Wright, on the first day, and Messrs. Pope and Jacques on the first two days, also listened frequently.

Cross-Q. 112. Please state what the arrangements and general course of proceeding were, in the receiving room, for listening or recording what was heard, so as to compare it with what was spoken in the transmitting room, and for informing the transmitting operator whether he was understood, and requesting him to repeat whenever the listener desired?

Ans. Speech was uttered into the instrument in the transmitting room and was received by me in the closet of the receiving room. If I distinguished the words or sentence, I immediately repeated the same aloud. If I did not distinguish it, I either said "no," or "repeat," or "once more," or "again," or something to that effect. During the first day the message, as I announced it verbally, was taken down in writing, chiefly by experts present for Complainants; and after they had done this, the same message was sent over the "tell-tale" line and received by Complainants' counsel, who compared what he heard with what had been written down. This plan was followed chiefly when series of numbers were transmitted. The newspaper paragraphs on the first day were not transmitted over the "tell-tale" line in their entirety, for purposes of comparison; and I believe that only the first two words of each paragraph were sent, so that the paragraph could subsequently be identified and comparison made at a future time. On the second and third days articles from newspapers, sentences, &c., were transmitted in short clauses which I repeated verbally, if I understood them, or else indicated that I did not, in the manner already stated. Then each clause, as I announced it, was sent back to the transmitting room through the "tell-tale" line, and the person receiving it there in turn repeated it aloud, so that the original sender could thus compare the message as I received it with the same as he had uttered it. If he found that I had misunderstood a word, or had failed to catch any part of the clause, he generally repeated it over again; and in this way it was possible to determine the accuracy of transmission as we progressed; and by the aid of the "tell-tale" line I was also enabled to suggest changes in the adjustment of the transmitting instrument.

During all these tests, I believe that there was a stenographer or other person present on behalf of the Complainants, taking notes of what was said and repeated back through the "tell-tale" line in the transmitting room; and on the second and third days a stenographer or other person on the part of the Defendants performed like service in the receiving room.

Cross-Q. 113. Will you please enumerate the different instruments which were used on the testing line during these three days?

Ans. Drawbaugh's original instruments "A," "E," "O," and "H"; the "reproduced" instruments "F," "B," "C," and "I"; Bell and Tisdel magneto-telephones.

Cross-Q. 114. When "H" and "O" were first produced in this cause, and marked for identification and drawn by Mr. Knight, the carbons, which were necessary to make the contacts and to transmit speech, were not in them; and their absence was indicated in Mr. Knight's drawings

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by dotted lines; when the instruments were formally offered in evidence, some time after December 14th, such carbons were in them. I understand that those carbons were placed in them by Mr. Drawbaugh, about the time you performed your experiments with them, in November or December last, as you have testified, and for the purpose of enabling you to use them; is that a fact? I believe you have so substantially stated in your deposition.

Ans. I understand from hearsay that it is a fact.

Cross-Q. 115. At the close of your last examination, on the 21st of March, you called attention to the fact that the armature of "B reproduced" had become detached, by accident, and stated, that you thought some other displacement or disarrangement of the parts might have taken place since you used them at Eberly's Mills, in November or December, and it was then agreed that you might cause any such accidents or deterioration since your tests to be repaired for the purposes of the tests for the last few days. Will you please state what, if anything, has been done in those respects, and by whom, and when?

Ans. Shortly after the close of my last examination, while conversing upon the subject of these instruments, Mr. Ott, the Examiner in this case, reminded me of the fact, that many of them had been taken apart by Complainants' counsel during the progress of the examinations of Messrs. Knight and Drawbaugh, and that in some cases Complainants' counsel had put the instruments together again, and in other cases had left the parts of the instruments strewn upon the table, when the Examiner himself put such instruments together the best way he could; and as I remembered, myself, having seen many of the instruments apart in the hands of Complainants' counsel, I considered it almost a certainty that the instruments were not in working adjustment, as they were when I tested them before. The request made to me by Complainants' counsel was for a repetition of the tests previously made, and this, I considered, fairly involved a reproduction, so far as possible, of the conditions of the previous tests. One of these conditions was the putting in order of the instruments by Mr. Drawbaugh, and I accordingly asked Defendants' counsel to cause Mr. Drawbaugh to come here to New York, and make such repairs or adjustments as might be found necessary, in order to bring the instruments back to the state in which they were during my experiments of last winter and to neutralize, so far as possible, such deterioration as they might naturally undergo during nearly four months continual handling and two railroad journeys. Owing to Mr. Drawbaugh's familiarity with these instruments, I knew besides, that time could be saved by having him attend to them. Mr. Drawbaugh accordingly came on here, and, in the presence of the Examiner, I think, and mostly in my presence, made the following repairs:

In instrument "A," the thin wooden diaphragm was found to be warped, so that the armature attached thereto was not properly presented to the poles of the magnet. This diaphragm we slightly steamed, straightened in a copying-press, and replaced it in the instrument. During handling, a piece of the diaphragm was accidentally broken off. We glued this on again with a strip of paper pasted over the joint to hold it firmly. That is all that was done to that instrument.

In instrument "B," we simply re-secured the armature to the diaphragm with a little glue.

In instrument "C," we placed a piece of wood across and over the permanent magnet, and put a screw down through this piece and into the wooden base. The object of this was simply to hold the magnet in place, and to prevent accidentally moving the magnet during the experiments.

To instrument "E" nothing was done, beyond connecting with solder one of the conducting wires leading from the instrument, which wire broke in my hands this morning, while I was testing it.

To instrument "F" nothing has been done beyond re-filling the cup with the carbon powder, which, Mr. Drawbaugh informed me, is of the same composition as that used in the instrument during my previous experiments, and contains gas-carbon and plumbago.

We undertook to repair instrument "D" for use in this test, but on examining it discovered, that the conducting wire leading from the inner end of the coil had become broken off close up to the metal disc on the end of the core. It was impossible to attach a new conducting wire to this by twisting it on, and so we tried to solder on a piece of wire and establish the connection in that way. On trying the instrument, however, after the junction was apparently effected, we found that either the joint was very imperfect, or else that there was some short-circuiting in the coil itself, as the magnetism produced in the case by a battery-current was only barely perceptible. On testing the instrument myself, I obtained sounds through it very feebly. As the instrument had already been put in evidence, I did not feel justified in unwinding the coil to find out the trouble. In my previous experi-

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ment with this instrument, I took it apart and rewound the coil with the original wire that was on it, after repairing a break upon it, which then occurred. I then found the instrument "D," as I have already testified, to receive and transmit speech well, and in all particulars to be as good an instrument as instrument "E," the construction of which is almost exactly similar. As I did not feel justified in unwinding the coil without the express consent of Complainants' counsel, and as to subject the instrument to trial in its present condition could not result in a fair showing of its capabilities when in good order, it was not used during the tests lately made.

In instrument "I" no change of any kind has been made beyond the insertion of one or two paper gaskets under the diaphragm, in order to modify the distance between the armature and the poles of the magnet. In instrument "O" nothing has been done beyond sand-papering the carbons to expose fresh surface. In instrument "H" a new intermediate carbon was put in between the two fixed carbons, the intermediate carbon or carbons used in the previous tests having been lost. This single carbon took the place of the three carbon balls shown by dotted lines in Defendants' "H" drawing.

We also put a new pair of brass hinges on the door of "H" instrument, leaving the old white hinges on, these last having become broken; and we also re-soldered some of the connecting wires at the old places from which they had become separated. I think I have now named everything that we did to the instruments, other than the adjustments made by the means provided in them for the purpose, these adjustments being made not only before, but frequently during the progress of the tests.

[*At the request of the Defendants' counsel the examiner certifies that all the above mentioned work in the way of repairs and adjustments, for the recent tests, was done in the presence of the examiner.*]

Adjourned until March 31st, 1882, at ten, A. M.

March 31*st*, 1882, 10, A. M.

Examination resumed pursuant to adjournment.

Present same counsel.

Cross-examination of Mr. Park Benjamin by Mr. Storrow continued:

Cross-Q. 116. Will you state, if you can now, how the carbon powder for the cup of "F" was prepared, and what proportion of plumbago was in it, if you have ascertained from Mr. Drawbaugh?

Ans. Mr. Drawbaugh has informed me that the powder used in instrument "F" is composed of carbon from gas-retorts, and plumbago, in the approximate proportion of five parts of carbon and one part of plumbago, the carbon being first ground and the plumbago being obtained in a pulverized state. The materials were mixed in a mortar. The proportions before stated were by bulk and not by weight.

Cross-Q. 117. I understand that when the instrument "H" was first produced and identified and marked by the examiner, the wires inside were so broken as to destroy the electrical connections and render the instrument incapable of use. It is evident from your deposition that the electrical connections had been repaired and restored by putting in new wires or resoldering the old ones, as well as putting in the intermediate carbon, between the time when Mr. Knight made his drawing and the time when you made your test, in December last. Please compare Mr. Knight's drawing with the instrument now present, and state what appears to be the fact in that respect?

Ans. The Defendants' "Exhibit H drawing, sheet 2," shows as follows: The primary wire leading from the diaphragm to the induction-coil is indicated as broken. In the instrument the separated ends have been twisted together, completing the connection, and a little solder applied to the twist. The other primary wire leading from the induction-coil is shown in the drawing passing through a plug marked L^2. The end of this wire appears to have been removed from this plug and soldered to a brass plate, marked K, attached to the inside of the box, leading the circuit through a wire marked L' in the drawing, sheet 2, which wire is led up through an aperture on the right hand side of the top of the box, not lettered in the drawing; and at this point another length of wire is connected to it in the instrument, to establish communication with the battery. The primary wire connected to the upper end of the plate D', in sheet 2, is shown as detached in the drawing from the plug or binding-post to which it should be attached on the side of the instrument. This connection has been re-established, and another piece of wire has been added on outside of the box for purposes of convenience in making connections with the battery. The two secondary wires leading from the induction-coil are shown properly secured to their binding-posts K^3. They are still so secured in the instrument. The short wire leading from the lower binding-post K^3 to the upper end of the switch K′ is now in place in the instrument, as shown in the drawing. In both series of tests this switch was left open. The bell connections and mechanism, shown imperfect in the drawing, have not been restored, nor has this part of the apparatus been used during the tests. Two wooden plugs have been inserted in the apertures through which the primary wires leave the instrument, in order to hold said wires in place. These connections are substantially, I think, the same as the drawing indicates to have existed in the original instrument. The change in the attachment of the primary wire from the plug L^2 to the plate K was rendered necessary by the loss of an outside swinging switch-lever not shown on the drawing, but which switch-lever extended from the pivot, marked L in "Exhibit H drawing, sheet 3," to the point L^2, where the wire was connected, and the wire leading out of the instrument was connected to this switch-pivot. What has been done is to make a direct wire connection through the plate K, instead of through the switch-lever, so that no material change has been effected in the arrangement of the circuit. The switch lever is not shown on any of the views of the instrument given in the drawings, and hence appears to have been absent when the latter were made.

Cross-Q. 118. Please state whether the instrument "H" was held in the hands of the operator or how it was supported, during the recent tests?

Ans. During the first day of the tests, this instrument stood on a long table in the rear room. It was not in any wise attached to the table. There were constantly a number of people in the room, and many of them were gathered about the table, often leaning upon it for purposes of writing, &c. I have found by actual experiment, that the instrument "H" is an exceedingly sensitive transmitter, and I noticed at once, when it was used in connection with the receiving instrument "A," during the tests made on the first day, that the sounds transmitted by it were being greatly interfered with and modified by accidental bodily movements of people about the table—by the vibration of the instrument as a whole upon the table, whether caused by the shaking of the latter, or by a possible slight movement of the instrument itself by the person speaking into it—perhaps through the influence of his voice itself. At all events, I noticed that the sounds and speech obtained through this instrument and "A," under these conditions, was much less clear and distinct than I had obtained with the same instruments during previous tests, when means were taken to give the instrument "H" a better support, or when it was not so liable to accidental disturbance. The tests of instruments "H" and "A" occurred at the end of the first day, March 28th, and immediately thereafter I caused the instrument "H" to be firmly secured to the walls of the room, by screws passing through the two holes, shown in the drawings, in the back-board of the case. I left the instrument "A" exactly as it was—made no change whatever in it—and on the following morning repeated the tests of the two instruments "H" and "A." The result proved, I think, that the difficulty was due to the cause I have indicated; for on this second trial, speech uttered into "H" was received by me through "A" clearly and distinctly, and with exceedingly little loss of words or misunderstanding, even under the rigorous conditions of test which I have already described. During the remainder of the tests the instrument was left attached to the wall, and no change was made in it, other than such as occurred during the ordinary adjustments of the carbons, as the same were judged necessary.

Cross-Q. 119. Will you please describe how the tumbler instrument, marked "F reproduced," was held or supported during the tests of this week?

Ans. Most of the time, I think, it rested on the table referred to in my last answer, and during the last day a large block of artificial stone was placed beneath it, so as to afford a little firmer support. The stone rested on the table.

Cross-Q. 120. Will you please to look at the original instrument "F," which is stated to have had at one time a membrane diaphragm, and state whether you perceive any way of attaching or securing the diaphragm, except tying or securing it to the top of the tumbler; and then state whether you think it possible to attach a diaphragm to a smooth glass tumbler, so as to stretch it and keep it stretched; and if so, how it could be done in that instrument?

Ans. I think I will undertake to put a membrane diaphragm on the instrument, if the counsel desires it, stretch it and keep it stretched; and I think I will do it in two ways, as follows: First, begin by wetting the membrane; that makes it soft and pliable and expands it some; take the plate and supporting wire out of the mouth-piece; lay the membrane across the bottom opening of the mouth-piece; bring its edges up around the sides of the mouth-piece and pass waxed silk or strong thread around membrane and mouth-piece, and above the bead or ridge which encircles the lower edge of the latter; leave the membrane rather loose. Now hold the mouth-piece up to the light, so as to show the hole, through which the plate rod passes, and make an aperture in the membrane for said rod, which can now be replaced; now put the mouth-piece on the tumbler, pressing it well down; the membrane being somewhat loose, and also yielding, will give considerably, and sufficiently to enable the mouth-piece to be pressed down in place; now set the apparatus aside, until the membrane is dry and consequently contracted, and I think it will be found firmly and tightly stretched across the top of the tumbler.

Second method, somewhat simpler; I have here a silk handkerchief; I place it over the top of the tumbler; I place the mouth-piece down on it, pushing the mouth-piece down slightly; there is the diaphragm secured in place by the mouth-piece and, I think quite tightly; and if this handkerchief was a wet membrane, on its becoming dry in its present position, it would be found stretched tightly and permanently. It will be noticed that this tumbler has quite a flare to it, so that there would be no difficulty in securing the diaphragm by a string, if any one chose to do it in that way; though that doesn't seem to be necessary, in view of the tight fitting of the mouth-piece. This method of fastening a membrane over the end of a smooth cylinder by a ring or band pressing down upon it is very old, and Mr. Drawbaugh need have looked only at the first drum he came across, to have got the idea.

Cross-Q. 121. In using the instrument marked "B reproduced," (tin can receiver), during the present week, have you found the operation of the instrument interfered with or stopped by the tin can slipping towards the magnet, so that the armature and magnet came in contact?

Ans. To a certain extent, yes; but that is due to the way I held the instrument, for purposes of convenience, in listening at it. It will be seen by the drawings, that this instrument was originally made to be placed upon a table, or other support, so that the person using it could bring his ear to the instrument, instead of holding the instrument to his ear, as I did. It will be noticed also, that the drawings show, that the distance from the mouth of the can to the edge of the base is the same in both instruments; while in the original instrument "B," the distance is greater than in "reproduced instrument B." I think the board has been cut off, in the latter case, merely to allow the instrument to be more conveniently handled, and to enable the user more easily to place his ear against the mouth of the tube, when the appar-

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atus is held in the hand. The can is not very tightly secured by its strap, in the reproduced instrument, and hence it slipped a little at times, with the result of occasionally interfering with the operation of the instrument; though this slipping, as I have said, was due to my handling, and could not have occurred if the instrument had been fastened to the table. During my tests at Eberly's Mills, I had the instrument "B" on a support, at a convenient height for my ear; and did not hold it in my hand, and consequently was not then troubled with the slipping of the can.

Cross-Q. 122. It appears to me that the instrument marked "B reproduced," and used in these tests, is not the same instrument, shown in Mr. Knight's drawing, marked "reproduced B drawing." Please compare the instrument and the drawing, and state what the fact is about that. I also call your attention to a statement of Mr. Hill, the Defendants' counsel, on page 1040 [1005] of Defendants' printed record.

Ans. The instrument "B reproduced," which I used, is essentially the same as that shown in Defendants' exhibit "reproduced B drawing," but differs in immaterial matters of detail, which differences will be apparent on inspection. From the statement of Defendants' counsel, which I have just heard read, I understand that the drawing while representing exactly one of the two reproduced instruments "B," mentioned by Mr. Drawbaugh, in his answer to X Q. 1328, does not precisely show the instrument "reproduced" "B" in evidence. A pair of couplers, which I put on during the tests for purposes of convenience, still remain upon the instrument.

Cross-Q. 123. What batteries were used, during the tests of the week?

Ans. Two Leclanche′ prism cells; sometimes only one was used; sometimes two; never more than two. I noticed no difference in results, whether one or two cells were used.

Recess for lunch from 1 to 2 o'clock, P. M.

Re-direct examination of Mr. Park Benjamin by Mr. Hill.

Q. Q. 124. In these recent tests, March 28th, 29th and 30th, under the conditions which you have described, you tested the several instruments named, by the transmission of articulate speech through them and the line; did you?

Ans. I did.

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Q. Q. 125. On March 29th did you test the instrument "H," as a transmitter, with the instrument "E" as a receiver, the former being located, during the test in the back room, and the latter in the front room, or the closet opening therefrom?

Ans. I did.

Q. Q. 126. What instruments were used on the "tell-tale" line during that test, to report back into the back room, what you heard through "E," in the front room?

Ans. Two Bell magneto-telephones, of the "butter-stamp" form.

Q. Q. 127. Who were with you, in the front room, during that test?

Ans. Mr. Storrow, Mr. Jacques, Mr. Paddock and Mr. Donahoe, a stenographer, and Mr. Marcus Marx, were in the room most of the time, and others came in at intervals.

Q. Q. 128. Who operated the "tell-tale" telephone, in that room, during that time?

Ans. Mr. Storrow, chiefly; in fact nearly all the time, during the tests of the instrument mentioned.

Q. Q. 129. Referring to that test of those two instruments, "H" transmitter and "E" receiver, please give such a history of it as will enable the Court to understand it, and its results fully and exactly?

Ans. To do this I shall read from notes, taken in the transmitting room, of what was transmitted to me, and verified by repetition back through the "tell-tale" line. The speech transmitted was uttered by Judge Hill, Defendants' counsel, and received by me, and was transmitted back over the "tell-tale" line by Mr. Storrow, Complainants' counsel, and received by Mr. F. W. Smith, present on behalf of Complainants, and who repeated aloud what he heard. It will be noticed occasionally, where Judge Hill's utterences involved an inquiry, I repeated them, and added an answer.

The letter H shows what Judge Hill said; the words in *italics* were repeated once; words in SMALL CAPITALS were repeated twice. The asterisks (*) indicate the number of repetitions over the "tell-tale" line, through the Bell instruments.

H. "What time did you get to bed last night?"

(I repeated, and answered: "About half-past twelve.")

H. "Did you go by the elevated railroad?"

(I repeated, and answered; "No, I walked up.")

H. "It must have been a long walk."

(I repeated, and answered; "No, it is only a mile.")

H. "Do you want some elevated railway news? I will read a report about the little girl's case, who was killed the other day; do you want that?"

(I repeated, and answered; "Yes, give us all you can.)"

H. "To get information—"

(I said; "Anything cheerful," and repeated.)

H. "I did not say, 'anything cheerful;' I began with, 'to get information;' I will begin again."

(I repeated, and answered; "Yes," when Judge Hill proceeded to read continuously, as follows; uttering a clause of a few words, and waiting until the same was repeated back through the "tell-tale" line, to the transmitting room.)

H. "To get information from the elevated railway officials, respecting affairs which the public have a right to know about, is a very difficult undertaking. The officials are particularly out of humor at present, with newspaper reporters, who persist in their inquiries, regarding the fatal accidents, that are occurring at rapid and almost regular intervals. The sad fate of the little girl—"

(The proper name transmitted here, I failed to catch. It was repeated, and I repeated it over, as I understood it, five times, finally settling on "Marie Menzel." The following word, "who," was repeated once.)

H. "—— was killed at Sixth Avenue and Twenty-third street, on Saturday evening, provoking a keen search."

(I failed to understand the last four words, and they were repeated four times for me. I still failed to catch them, and the first word was spelled, letter by letter—four times. I still missed three of the letters, and couldn't make out the word.)

H. "I am tired of repeating that pro-vok-ing.—"

(I then understood the word "provoking," and repeated it.)

H. "Keen—k-e-e n."

(I understood and repeated that correctly.)

H. "Search,—Search—s-e-a-r-c-h—s-e-a-r-c-h."

(I understood and repeated correctly.)

H. "for particulars, on the part of the reporter, has had the effect of *sealing* the mouths of *nearly all* the employés of the road, and making it more difficult than usual to get information. To-day a reporter for the *Graphic* called on Col. Hain, the general manager of the line, to learn the name and address of the brakeman on whose car the accident occurred, and what steps, if any, the Company had taken to place the blame where it belonged. The following colloquy took place: 'Has any investigation been made in the matter of Marie *Menzel?*' 'No.' 'Why not?' 'Haven't had time.' 'Is any going to be made?' 'Yes.' 'When?' 'As soon as we get time.' 'Has any statement been RECEIVED from the brakeman, regarding the matter?' The following clause is in parenthesis: 'It is customary, when accidents happen on the road, for employés knowing the facts to report them in writing;'—End of parenthesis. 'No.' 'What is the brakeman's name?' 'Don't know.' 'How is that?' 'Haven't had time to find out.' 'What *is* his address? 'Don't know.' 'Doesn't the Company know the *names or addresses* of its employés?' 'Yes, the train-master does.' The latter official was found at the station over Battery Park. The following colloquy took place between him and the reporter: 'Will you be kind enough to give me the name and address of the brakeman on whose train Marie Menzel was killed on Saturday evening last?' '*Doctor Shine will give you all the information about that.*' 'COL. HAIN *said ten minutes ago*, that the names and addresses of all the employés were known to you.' At this juncture the TRAIN-master held a long whispered conference with some subordinate official in his office. 'Can you give me the man's name?' asked the reporter when the conference seemed to be over. 'What is the use of publishing so much about the thing?' answered the train-master, evidently much annoyed. 'To learn on whose shoulders should fall the responsibility of the little girl's death.' 'The conductor's name is Zabriskie,' said the trainmaster after a moment's reflection. 'What is the brakeman's name?' 'I don't know, because he didn't respond to the order asking for *names* and addresses.' 'What order was that?' 'An order issued recently to employés to send in their names and places of residence. 'Was the brakeman a green hand?' 'No.' 'How long *has* he been employed on the road?'* 'A long time.' 'Then his name is on the pay-roll. 'What is he called there?' 'Bishop.' The reporter drew a long breath, and then began *an* attack for the first name. His efforts were in vain. Dr. Shine was next sought. He is the surgeon of the Company, and is supposed to know the names of the employés. 'Doctor, where does brakeman Bishop live?' 'Really, I don't know.' 'What is his first name?' 'I have forgotten.' 'Is it Henry?' 'Yes, it's Henry.' '*Do you know any more about the man than that?*' '*Oh, we know the men by their numbers, you know.*' 'What is his number?' 'Let's see, looking up at the ceiling.' '*Well, really, I have forgotten.* By the way, said Dr.

Shine, 'Bishop will be here about half-past twelve o'clock sharp. Come in then and get his story. The Company doesn't want to conceal anything.' The reporter was on hand promptly at the time. 'Dr. Shine has gone out,' said the girl who answered the door bell; 'will you wait? He waited a long time. At twenty minutes to two the Doctor was still absent and Bishop had not come in. It *is* understood that the Company *is* having a *device* made similar to the iron gates in use on the North River ferry boats. These are to be so arranged *between* the car platforms that an accident by falling between the cars would be impossible. Two hundred of these gates are in course of construction. The company has six hundred cars in use every day. That is the end of the article. It's title is, 'A reporter's difficult task. An illustration of the reticence peculiar to elevated railroad officials.' Amen." (At the end of this reading I left the receiving station, and Mr. F. L. Pope took my place. I remained in the receiving room and heard him repea what he heard to Mr. Storrow, who transmitted it over the "tell-tale" line. I find the following record on the notes taken in both rooms:)

H. "Mr. Pope, is that you at the instrument? I am about five feet away from it now. Shall I go farther? 'About five feet' repeated again. "*I am now about* TEN *feet away*. About ten, ten, t-e-n. Did you hear? *Did* you hear me? (Didn't get that at all.) I will now retire from the instrument A FEW FEET. (Can't get that, six times repeated.) I am now about six feet away. I am now about ten feet away. About ten feet away. I am now about ten feet away. I will read to you from the *newspaper*. WAIT *till I find* a good article." (Not heard, repeats twice more.)

"I read from the *Daily Graphic* of March 27th, 1882, as follows:

Last Wednesday in San Francisco a Mrs. Andrews *was instantly killed while walking in a prominent street* in company with her husband, upon whose arm she was leaning at the time of the fatal accident. *A business sign*—b-u-s-i-n-e-s-s—twenty-five feet long and eight feet wide, *fell from a considerable* HEIGHT. I did not say anything about "wife." I said fell from a considerable height, striking the unfortunate lady, and crushing her to the ground. Mr. A. escaped *with a few severe bruises.* The accident was the outcome of a violation of the city ordinance, which *had* become a dead letter. Is not this a warning to New York City authorities?

That is the end of the article that was read.

Do you want me to read another?"

At this point Mr. Drawbaugh came to the transmitting instrument.

The letter D indicates what Mr. Drawbaugh said into "H" as a transmitter, the italics and asterisks denoting as before the number of repetitions through the Drawbaugh and "tell-tale" lines respectively.

D. "MASSACHUSETTS FACTORY OPERATIVES. *This year's report.* (Factory, was uttered four times.) (I answered, "You are too near the instrument. Something about Court—'something before report.'" "Don't know what is before report.")

D. "*This year's—t-h-i-s*—year's report of the Massachusetts bureau of statistics of labor IS DEVOTED (four times) *more largely than usual* to subjects of purely local CONCERN. Some of the FIGURES—*f-i-g-u-r-e-s*—are, however, of general interest. The first subject discussed is the CONSTANTLY INCREASING CANADIAN FRENCH ('French' uttered three times) population OF *New England.* In the last report of the Bureau SOME VERY SWEEPING (uttered five times) and, as it now appears, very unjust remarks were made about these people."

D. "See if you can get the words you lost." (I replied, "No.")

D. "I'll give it. In the last report of the bureau *some very* SWEEPING (five times)—*s-w-e-e-p i n-g.* THEY (five times) WERE DENOUNCED (three times)—*t-h-e-y*—as *dirty*, ignorant and immoral, and in *order* to TAKE all this back—*t-a-k-e*—nearly one hundred pages are required. THEY MAY WELL FEEL PROUD—"

(I understood this to be, "feeling very well," and so answered.)

D. "That is not right. (I asked 'what is in front of very well?') '*They may well* FEEL PROUD.' Do you get that?—feel proud—*f-e-e-l*—not 'feeling' but 'FEEL PROUD., 'Feel proud' is the word—OF THE SHOWING—not 'as the showing,' but 'of the showing.' Not 'as' but 'of'—o-f—*they* MAKE HERE."

(Judge Hill here spoke into instrument "H," I remaining at instrument "E.")

H. "Mr. Benjamin, are you at the instrument now?"

(I repeated; and answered, "Yes.")

H. "Do you hear me clearly? The trouble is with Drawbaugh's voice; is it not? I thought that was the trouble. We will try to let him get through the article. I know it is very husky, and bad for the telephone, but we will try to let him get through the article, and after that I will read something to you."

(Mr. Drawbaugh now resumed his station at instrument "H," while I remained listening at instrument "E.")

ELEPHONE COMPANY,-2

D. "Mr. Benjamin, do you hear me now?"

(I repeated, and answered, "Yes.")

D. "Shall I go on with the article? Do you hear me distinctly?"

(I repeated, and answered, "Yes.")

D. "Shall I go on with the article?"

(I repeated, and answered, "Yes.")

D. "I will go on then. Now listen—they make here."

(I understood and repeated—"A late beer.)"

D. "No 'beer'—'here'—*h-e-r-e*—have you got the three words *they make here?* The three first words are 'they make here.'"

(I replied that I didn't know what they were.)

D. "'They make here.' I will go on with the rest, 'AND NATIVE (five times) NEW ENGLAND (three times) *must feel a sense of relief*—'"

(Mr. Drawbaugh here retired from instrument "H," and Judge Hill took his place, I still remaining at instrument "E.")

H. "Massachusetts factory operatives. Are you ready now, Mr. Benjamin? This year's report of the Massachusetts Bureau of Statistics of Labor is devoted more largely than usual to subjects of purely local concern. Some of the figures are, however, *of general interest.* The first subject discussed is the constantly increasing Canadian French population—not 'French,' but 'Canadian French'—In the last report of the Bureau some very sweeping, and, as now appears, very unjust remarks were made about these people. *They were denounced* as *dirty,* ignorant and immoral, and in order to take all this back; nearly one hundred pages are required. They may well feel proud of the showing they make here, and NATIVE *New England* must feel *a sense of relief at* learning that they are rapidly becoming assimilated to the rest of the population."

(Mr. Jacques now took my place at instrument "E," Judge Hill continuing at instrument "H." The notes show the following conversation between them:)

H. "*Mr. Jacques, are you at the instrument now?*" (Understood and repeated by Mr. Jacques.)

H. "DO YOU HEAR ME DISTINCTLY? (the whole sentence twice and 'distinctly' twice more.) *D-i-s-t-i-n-c-t-l-y. I will speak* A LITTLE LOWER. *See whether you hear me better* (not heard at all) *in a lower tone of voice.* Do you hear me better now? What do you think of QUEEN VICTORIA? I was too far from the instrument probably. Do you hear me better now? I will give you another sentence. How would you like to have the *bonds* that Jay Gould showed his friends the other day—*bonds*, not the 'bargain,' but bonds—b-o-n-d-s—it *is* bonds. YOU HAVE GOT IT RIGHT NOW. How would you like them?"

(This was finally understood and repeated by Mr. Jacques.)

(Mr. Drawbaugh now took his place in front of instrument "H," Mr. Jacques remaining at instrument "E.")

D. "Mr. Jacques, Drawbaugh is speaking now. Can you hear me *distinctly?* Mr. Jacques, it is getting time to take a lunch. Do you understand that? Do you feel so?"

(This was understood and repeated by Mr. Jacques, and there was a recess for lunch.)

It will be seen that I had some difficulty in understanding Mr. Drawbaugh when he read from a newspaper, although I had little trouble in recognizing what he said in conversational form. Mr. Drawbaugh's voice was more than usually husky, and certainly not in its normal condition. For, during my previous tests made at Eberly's Mills, I preferred that Mr. Drawbaugh should talk through the instruments, as I got his speech better and clearer than that of anybody else present at the time. Mr. Drawbaugh is naturally very diffident, and to read a newspaper article with long words in it before a room full of people, I think rather overtaxed him. The same article read afterwards by Judge Hill I understood very well.

Q. Q. 129. After completing the above described tests with the instruments "H" and "E," did you make a test with the instruments "H" and "A"; if so, please inform the Court of that test, as fully and accurately as you have just described the other test.

Ans. I did; and I now read from the same notes, as follows:

(In order to adjust the instruments, a series of numbers and a few words were said; and as soon as the adjustment was completed, Judge Hill proceeded as below.)

H. "I will read from the Congressional report of March 27th, in the *Graphic.* 'The bill reported from the Library Committee by Mr. Sherman, to continue the publication of the *American Archives*, was passed.

Mr. Morgan introduced a bill granting the right of way over public lands in Alabama to the St. Louis and Florida Railroad.

Mr. Allison offered a resolution—Mr. Allison, not 'Anderson'—instructing the committee on Revision of Laws to report what further legislation is necessary to define the meaning of the word "Indian Country" in the various statutes. Adopted.

Mr. Hoar introduced a bill to amend the statutes relating to copyright.

A motion by Mr. *Vest*, (repeated and spelled,) to recommit the bill admitting Dakota as a State, led to a short debate—debate not 'dispute'—on the financial record of the territory, but finally prevailed.

The bill granting the right of way for railroad purposes, through the lands of the United States Powder Depot, near Dover, New Jersey, passed.

The bill granting a pension of $50,000 per year to Mrs. Garfield, Mrs. Polk and Mrs. Tyler, from September 10th, 1881, passed. That is the end of the Senate proceedings of yesterday.' "

H. "Are you ready? I will now pass to the House proceedings.

'House of Representatives, Washington, March 27. The House adopted a resolution asking the State Department, to furnish a copy of any protocol or other papers, signed by Mr. Trescot, in solution to Chilian or Peruvian matters; also, to furnish any information in its possession *touching the prospects of the release of* American citizens, in British prisons.

Mr. *Flower* of New York—F-l-o-w-e-r—introduced a petition—'Yes,' I've been reading all the time. Are you ready to go on?—signed by 2000 New York merchants, for the passage of the Lowell Bankruptcy Bill.

The following were among the bills introduced.

To authorize the issue of $25,000,000 in fractional currency—not '$45,000,000,' but 25,000,000.

For the appointment of a commission to examine into the overflow of the Mississippi, *and report what is needed to prevent its reoccurence.*

To grant lands to Alabama, to the St. Louis, Montgomery and Florida Railroad.

To establish a Department of Industry.

To establish experimental farms in various sections of the country.

To pay the Government experts in the Guiteau case, $25 per day.

To survey the route of the Maryland and Delaware Canal.

To repeal the license tax of Commercial Agents in the District of Columbia.

Defining copyright, and to enact laws for the punishment of the violation of the rights.' That is the end of the House proceedings yesterday. Now I will try something else, if you want it.' "

H. "All right, I'm ready, are you?"

"A special Bankruptcy Commission of the New York Board of Trade and Transportation has published a broadside *comparing the Lowell bill and the Equity scheme'*—No, that's not right—'comparing the Lowell bill and the Equity scheme, now pending in Congress. To be sure, the Lowell bill makes a good show, and the Equity does not, but the latter is less important as the draft of a Bankruptcy act than as an obstacle raised for preventing the consideration of Judge Lowell's excellent bill.

The Equity scheme is dignified rather too much, when compared with the only well matured Bankruptcy proposition before the country. Why the latter is not taken up before Congress, *it* would be difficult to say, unless it be true, that Congress is partial to those measures which either are urged by the importunities of the country or like the *franking bill*—f-r-a-n-k-i-n-g—promote the personal interests of Congress, or like the apportionment act, help some political interest. If bills be judged upon their merits, the Equity scheme is not worth considering.

That is the end of the article about the Equity scheme."

Mr. Klemm now took Mr. Storrow's place at the "tell-tale" line, and Judge Hill continued reading into instrument "H."

H. "*A protest against the admission of* Dakota, was presented in the Senate yesterday, by Mr. Hale of Maine, who gave notice, that when the bill *for making* that territory a State was considered, he should propose an amendment, before the admission, until the record of the territory was clear. The allegation is, that the county of Yankton as principal, and the legislature of Dakota, as accessory, have violated the condition under which $200,000 was obtained under bonds, *to secure the construction of a railroad.* Mr. Hale said, his information was obtained from responsible citizens of Maine, who had been sufferers.

(Mr. Jacques now took my place, at instrument "E," and Mr. F. Smith spoke to him through instrument "H."

S. "Halloa, Mr. Jacques; are you ready? Do you understand what I say? Mr. Jacques, it is a lovely day. There is a great deal of news in the paper this morning, would you like some of it? I wonder if it is raining in Boston this afternoon?"

(Mr. Pope now took instrument "E," and Judge Hill spoke to him using instrument "H," as a transmitter.)

H. "Mr. Pope, do you hear me now?"

H. "Did you ever *eat* Boston baked beans and brown bread?"

H. "I will read from a newspaper article. Do you hear that? The new *wheat* regions. All estimates of the probable crop of wheat the country will produce this year, and the years immediately following, must take into account the remarkable development of the new grain fields of the far Northwest; Eastern Dakota and the adjoining portions of Manitoba are fast becoming an immense granary—'Halloa, shall I read to you from the newspaper. Well, what do say?'—Many thousands of new farms will be opened in that section this spring, and the settlers of last year almost without exception sow an *increased area of ground*. In fact, the *rule* among the *farmers*—the rule is to work as many acres as they can command the labor of men and animals to plough in season for seeding. The profits on wheat growing have proved to be so large and so trustworthy that the settlers are eager to make as large crops as possible. The experience of those who have been a few years in Dakota shows that an average net profit of $10 for every acre sown can be depended on with almost absolute certainty."

The speech received through instrument "A" was, I think, fully as good as that received through instrument "E." It is, of course, scarcely possible on these notes to indicate the cause of the repetition of words and clauses. In some cases I lost them through accidental noises occurring in the room, building or street. Sometimes there would be simultaneous talking at the receiving end of the "tell-tale" line, taking off my attention; and frequently I called for the repetition of a whole clause of several words because of my misunderstanding one in it. The percentage of words which I actually failed to understand until after numerous repetitions is exceedingly small, and most of these words were proper names. I was particularly careful to avoid guess-work, and often called for repetitions when I was reasonably certain of what the words were, by their general sound or context, because I had not heard them clearly enunciated; and I think I can say, that, taking everything into consideration, the speech which I heard, through the instruments "H" and "E," and "H" and "A," was fully as good, if not better, than any I have ever heard over the local telephone lines in this city.

Q. Q. 130. You have given an account of the demonstration of the capacity of instrument "E" as a receiver. In these recent tests, here in New York, has any demonstration been made of its capacity as a transmitting instrument; if so, please give the Court full and accurate knowledge of the facts?

Ans. On March 30th, the third day of the tests, instrument "F" was placed at the transmitting end, and instrument "A" at the receiving end. On the "tell-tale" line a Bell instrument was attached in the transmitting room and instrument "E" in the receiving room. Judge Hill spoke into instrument "F, reproduced." I received his words at instrument "A," and repeated them aloud to Mr. Marcus Marx; and he repeated them into instrument "E," and what he said was heard by Mr. F. W. Smith and Mr. Ott, and possibly some others at the Bell instrument on the other end of the "tell-tale" line. The testing of "F" and "A" required considerable conversation back and forth on the "tell-tale" line, owing to the extreme delicacy of "F" in the matter of adjustment, and this conversation was maintained intelligibly, as I know by the fact that I got intelligible answers through instrument "A" to questions which I heard Mr. Marx put through instrument "E," used as a transmitter. I also heard Mr. Marx converse for a considerable time with persons at the other end of the "tell-tale" line, through the two instruments mentioned. Subsequently I talked into the instrument "E" as a transmitter, with Mr. F. W. Smith, and also with Judge Hill, as follows: Some adjustment was first found necessary, as very loud talking by Mr. Smith at first resulted in faint tones received by me through "E" as a receiver. In the following conversation I used instrument "E" both as a transmitter and a receiver.

I talked into "E" as a transmitter, as follows: "I will read you something from a newspaper. Please repeat."

Mr. Smith answered, "Halloa. Once more. The door opened and spoiled it all. Now go on."

(The following is a note of what was uttered by Mr. Benjamin in the closet, and he understood that everything was received correctly by Mr. Smith, except when his, (Mr. Benjamin's) utterances indicated the contrary.)

"A test of the—Halloa, are you ready—A test of the underground—telegraph wires—laid in Market street—was made on Saturday—Saturday—in the presence of a number—of gentlemen from Boston, New York, Chicago and this city—one of the unfinished east rooms—one of the—one of the unfinished—unfinished—unfinished—east rooms of the new—public buildings—had been connected by five wires—with a store at Ninth and Market streets—and by a single wire—with the dynamo-electric machine—in the Grand depot—across the way—Three of the five running to Ninth street—were connected to telegraph instruments—these which were all solenoids—these which were all solenoids—solenoid—solenoid—s-o-l-e-n-o-i-d—Get that?—Halloa—Did you get that?—S-o-l-e-n-o-i-d—sol-en-oid—Yes, that is right—you have got it—Now I am going on—Halloa—you got that—are composed of one straight insulated wire—before one straight insulated wire, I said, are composed of—wrapped by another, their ends being joined—worked perfectly."

(The following is taken from Mr. Marx's notes on the same tests, taken in the back room where listening, Mr. F. W. Smith, was:)

"A test of underground telegraph wires laid in Market street was made on Saturday, in the presence of a number—a number of gentlemen from Boston, New York, Chicago—I do not get that—once more; I lost that—one of the—Don't get that—unfinished—the road of the new public buildings was then connected by five wires—being connected in a store at Ninth and Market streets; then by a single wire in the dynamo-electric machine in the Grand Depot across the way. Three of five running to Ninth street were connected with telegraph instruments (Mr. Smith says, 'Please repeat.')" These were all.

S. "It is loud but indistinct; you will have to spell it. It sounds like Alloid—No; please spell once more. A little slower and a little louder. I fail to get that."

B. "Solenoid."

A. "Yes, I'll listen; yes, that's all right."

B. "One great insulated wire—on the pole of one great insulated wire—ran by another, their ends being joined—worked perfectly."

(Judge Hill then took the Bell telephone at one end of the "tell-tale" line, and I talked into instrument "E" at the other end of that line. There was some little adjustment done, until he reported back to me that he heard me clearly; when I read to him the following article, clause by clause, which he repeated back to me in the same manner and as he heard it. The following is taken from the notes of Mr. Marx in the back room:)

"It was rumored at the hotels last evening that Mr. W. H. Vanderbilt had been taken ill very suddenly. A still later rumor had it—"

Judge Hill said, "repeat that louder." (I repeated last six words)—"that he had suffered a stroke of paralysis. An intimate friend of Mr. Vanderbilt, who was found at midnight, said that Mr. Vanderbilt went to his physician's office yesterday forenoon to consult him about a cold that he had taken, and that Mr. Vanderbilt—"

Judge Hill said, "The rest I lost because they were talking here." (I repeated part of the clause)—" when asked why he did not have his physician come to him, he answered, that he was quite well enough to go out—"

"I got that all right." (Said by Judge Hill.)

"This gentleman was to have called at Mr. Vanderbilt's house last evening, but was prevented by the rain. He said that if Mr. Vanderbilt had been stricken with serious illness he would have been likely to hear of it. He had heard of the alarming rumors, but he himself—"

Judge Hill said, "Did you say 'had no concern'?"

"Yes," I answered.

Judge Hill said, "That's what I thought you said at first"—'had no concern about them.'"

The only error in the reception of this was at the end of the last sentence, which involved a misunderstanding on the part of Judge Hill and myself. I said "He gave himself no concern," which was understood, "He himself had no concern," and so repeated back to me, when I understood it to be what I had originally said.

I read the foregoing article from the *New York Sun* of October 30th, 1881.

(The following is taken from notes made in the front room:)

"It was rumored about the hotels—last evening—last evening—Did you get that 'last evening'—Halloa—it was rumored about the hotels last evening that Mr. William H. Vanderbilt—had been taken ill very suddenly—still later rumor had it—that he had suffered—that he had suffered a stroke of paralysis.—An intimate friend of Mr. Vanderbilt—who was found at midnight—said that Mr. Vanderbilt—went to his physician's office yesterday—forenoon to consult him—about a cold he had taken—and that Mr. Vanderbilt, when asked—when asked why he did not have—why he did not have his physician come to him—answered that he was quite well enough to go out.—This gentleman was to have called—at Mr. Vanderbilt's home last evening—but was prevented by the rain.—He said that if Mr. Vanderbilt had been stricken with serious illness—he would have been likely to hear of it.—He had heard of the alarming rumors—but gave himself no concern about them.—That is all."

Adjourned until April 1st, 1882, at ten o'clock, A. M.

TELEPHONE COMPANY,-2

April 1st, 1882, *ten*, A. M.

Examination resumed, pursuant to adjournment.

Present same counsel.

Re-direct examination of Mr. Park Benjamin by Mr. Hill, continued.

The morning was occupied in verifying and copying notes.

Recess for lunch from 1 to 2 o'clock, P. M.

Examination resumed, pursuant to adjournment.

Present same counsel.

Re-direct examination of Mr. Park Benjamin by Mr. Hill, continued.

Q. Q. 131. You have given an account of the demonstration of the capacity of the Drawbaugh instruments "E" and "A" as receivers, and also of said instrument "E" as a transmitter; have you, since the cross-examination commenced, used the Drawbaugh instrument "A" as a transmitter? If so, under what circumstances, and with what results?

Ans. I have. On Monday afternoon, March 27th, 1882, the day before the recent tests began, I attached instrument "A" in the front room, and connected the line with a Tisdel magneto-telephone in the rear room of No. 4 East 14th street, New York, placing a battery in the circuit. Under this arrangement I found no difficulty in causing a person listening at the Tisdel instrument in the back room to hear what I uttered into the "A" instrument in the front room, through the line; and the conversation back and forth was for some time successfully maintained between us. I should have repeated this experiment during the recent tests, if I had not been fearful that the very thin wooden diaphragm "A" might become warped through the warmth and moisture of my breath. Mr. Drawbaugh regarded this as possible, and therefore I thought best not to use the instrument, as indicated. I will, however, if Complainants' counsel desires it, repeat this test at any future time.

The instrument "A," I understand, was constructed for use as a receiver, and, of course, when so employed, the diaphragm is not liable to become warped through the agency mentioned.

Q. Q. 132. From your various tests of the instrument "E" as a transmitter and as a receiver, and of the instrument "A" as a transmitter and as a receiver, and of the instrument "H" as a transmitter, state whether these instruments severally are, or are not, complete, practical electric speaking telephone instruments, for the transmission of spoken speech over electric circuits by means of electricity ?

Ans. I think that they are, unquestionably.

Q. Q. 133. Assume that Drawbaugh's instrument "A" was constructed in 1874, and take into consideration the comparison you have already made between this instrument and the apparatus shown in Bell's patent of March 7th, 1876, also your tests of said instrument "A," and state which of the two devices was the first practical working electric telephone for transmitting articulate speech ?

Ans. Drawbaugh's instrument "A." This instrument I have proved by a series of tests, now twice repeated under strict conditions, to be a good, practical, working electric speaking telephone. Even if Bell's device in his patent of March 7th, 1876, answered to this description, which it does not, as I have proved by making instruments in accordance with the patent, testing them and finding them utterly inoperative, still, under the assumption in the question, Drawbaugh's instrument "A" would be first in invention by more than one year.

Q. Q. 134. Assuming that Drawbaugh's instruments "D" and "E" were made in January and February, 1875, and having in view the same considerations to which I called your attention in the last question, please institute the same comparison, as to the device shown in Bell's patent of March 7th, 1876, on the one hand, and Drawbaugh's instruments "D" and "E," on the other hand.

Ans. I have proved Drawbaugh's instrument "E" to be a good, practical working electric speaking telephone, both as a transmitter and as a receiver, during both of the series of tests which I have made. I proved the same of Drawbaugh's instrument "D," which is constructed in almost a similar manner to Drawbaugh's "E," during my tests made at Eberly's Mills, and would have re-demonstrated the fact here in New York had not the instrument become accidentally injured in the interval, in the manner which I have already fully explained.

Even if the apparatus shown in Bell's patent of March 7th, 1876, is an operative one, which I have proved not to be the case, then, under the assumption in the question, Mr. Drawbaugh's instruments "D" and "E" were made about a year earlier, and at that time were capable of transmitting and receiving articulate speech through an electric circuit.

It would in my opinion be perfectly possible to place these two identical instruments ("D" being repaired) on any telephone line, and use them successfully as and for the purpose for which Bell hand telephones of the "butter-stamp" form are now commonly employed, under which conditions I think that very nearly, if not fully, as good results would be obtained as with said last mentioned Bell instrument.

Q. Q. 135. Bell's second patent, dated January 30th, 1877, lays particular stress on dispensing with a battery; please compare it, in that respect, with Drawbaugh's instruments "D" and "E"?

Ans. Drawbaugh's instruments "D" and "E" need no battery for their operation, both being magneto-telephones embodying a permanent magnet; so that in this respect they have the same advantage which Bell's device of 1877 has. No battery, it will be remembered, was used in my recent test, when I talked through Drawbaugh's instrument "E" and the "tell-tale" line to Mr. F. W. Smith and Judge Hill, in turn, who listened at a Bell "butter-stamp" instrument, and talked back to me over the same line.

Q. Q. 136. You mentioned the fact that Mr. F. L. Pope listened in the front room at instrument "A" or "E," or both; after listening did he make any remarks indicating his satisfaction, or want of satisfaction?

Ans. I was present in the room when Mr. Pope listened at the two instruments named, and I instructed the stenographer present, on behalf of the Defendants, to be particularly careful in noting down exactly what Mr. Pope said, if he should say anything at all, with regard to them. On the stenographer's notes I find the following, which accords with my recollection of what Mr. Pope said.

After hearing Judge Hill read to him the article already quoted in one of my previous answers, beginning "Last Wednesday in San Francisco, a Mrs. Andrews," which Mr. Pope heard through instrument "E," the words being spoken into instrument "H" at the other end of the line, Mr. Pope said: "I had no trouble at all in hearing anything spoken through Drawbaugh's instrument, and it compares favorably with any telephone that I ever heard. Words that were indistinct was the fault of the transmitter, and not of the receiver."

Mr. Pope also listened at instrument "A" to speech transmitted through instrument "H" and the line. During the course of the article on the new wheat regions, quoted in one of my previous answers, Mr. Pope said: "That is good enough. Let the other man try it now." I asked him, "Don't you think it (meaning instrument "A") is as good as "E"?" Mr. Pope answered, "That is first-rate." Mr. Pope then continued listening, and after another quite long section of the same article had been read to him—said section being quoted in one of my previous answers—said: "That is enough." I asked him, "How is that for a receiver?" (meaning instrument "A.") He answered, "That is very good indeed."

Q. Q. 137. State whether, during your recent tests here, you made any test of Drawbaugh's instrument "F reproduced" as a transmitter and if so, what instrument or instruments were used as receivers in connection with it?

Ans. I did. Instruments "E," "A," and "reproduced" "B," also Bell and Tisdel magneto instruments were used as receivers with it.

Q. Q. 138. State whether, during your recent tests, and while using "reproduced" "F" as a transmitter, and "E," "A," "reproduced" "B," the Tisdel instrument or the Bell instrument as a receiver, words, numbers or entire sentences were successfully transmitted through the line, and heard and understood by you?

Ans. There was no instance in any of the arrangements of instruments mentioned, when I failed to hear and understand articulate speech through instrument "F," the line and the receiving instrument, while listening at the last.

Necessarily, however, on account of the varying construction of the different instruments used as receivers, the proportion of words understood to that of words lost, as well as the relative clearness of articulation, varied. Using the comparatively crude instrument "B reproduced" as a receiver, I recognized and repeated words and parts of series of irregular numbers·

With instrument "A," the results obtained were almost phenomenal, in that I could distinctly recognize conversational speech, even in quite long sentences, although, strangely enough, I find difficulty in understanding selections read aloud into the transmitter from a newspaper.

Here are some sentences, which I read from the notes, which I heard distinctly through "F" and "A," and caused to be repeated back through the "tell-tale" line to the room from which they were transmitted, and where the notes were taken by Mr. Marx.

"What shall I do now? Shall I read to you something?"

"I will read again."

"Now listen while I talk. Do you hear that?"

"How plainly can you hear me?"

"Is now almost at its height."

"For his action in the Lamson case"

I have taken these sentences at random from the notes made in the back room, and I introduce them here merely to show the extent of the sentences that I clearly heard through "F" and "A."

The instruments "F" and "E" were not used together during the tests, although I tried them before the session on the morning of March 30th, and obtained through "F" and "E" rather better results than I afterwards obtained through "F" and "A." As "E" was subsequently fully tested in other connections, I did not think it necessary to include this trial among the tests. When "F" was used as a transmitter with a Tisdel magneto instrument as a receiver, sentences and words were received a little, though not much, better. Here are some of the sentences heard and repeated by me, and taken down by the stenographer in the front room:

"Have you heard of Judge Wallace's appointment? How do you like it?"

"Shall I read an article to you now?"

"How far can you understand what I say?"

I was, and am still, of the opinion that the Tisdel hand instrument used was somewhat out of adjustment, owing to rough handling, as it did not receive speech as clearly as the other instruments of the same kind which I used in my previous tests at Eberly's Mills. I took the Tisdel instrument off the line, after using it for quite a short time with "F" as a transmitter, and substituted a Bell instrument, through which I received in the front room the following sentences spoken into "F" in the back room.

The following are some of the sentences heard:

"Dan Drawbaugh is standing by my side."

"Do you like a Bell receiver better than a Tisdel?"

"Do you get it better now than before?"

"Do you think you can hear reading?"

"I will read something from the paper."

"I said, 'Repeat what you read, so that I can see whether you get it right or not.'"

"Why the devil can't you hear me when I read as well as when I talk?"

The whole test of this instrument "F" with a Bell instrument was, in fact, a constant trial for adjustment. Some of the results were very striking. Several times I heard short sentences, such as "Do you hear me now?" or others of a conversational nature, with absolute clearness and distinctness of enunciation. At times again the sounds would be very faint and far off, although the inflection of the voice could always be recognized. At one time the adjustment was such that the sound emitted by the receiving instrument was so loud as to make it painful to hold the instrument to the ear. These sounds I continued to hear coming from the receiver, even when I held the latter off at arms length. Of course, when these sounds were so exceedingly loud, articulation could not be clearly distinguished, although it was possible to recognize frequently the inflections of the voice. When I couldn't understand the words transmitted through instrument "F," the sound that reached me at the receiving instrument very much resembled the speech of Edison's phonograph. Vocal sounds were there, and the shape of the words, so to speak, could be distinguished, but the articulation wasn't clear enough for certain recognition of the words.

I think these tests demonstrated very conclusively the remarkable delicacy required in the adjustment of "F"; for the reason that the capacity of the instrument seems to range between the production of sounds loud enough to be heard at three feet distance, perhaps, from the receiving instrument, to those barely audible in the latter; and the change from one extreme to the other is effected by the movement of an adjusting-screw over an infinitesimal fraction of an inch. The difficulty of hitting an exact adjustment between these extremes, which shall give the requisite loudness, and at the same time the greatest possible clearness of articulation, will, I think, now be evident; although there is apparently a wide range of adjustment on each side of this best one, when the instrument will transmit articulate speech with sufficient loudness and clearness for practical purposes.

Q. Q. 139. Along towards the close of the test with Drawbaugh's instrument reproduced "F" as a transmitter, in the back room, and the Bell magneto instrument as a receiver in the front room, on the third day of the recent tests here, you complained through the "tell-tale," that the person who was speaking into instrument "F," was speaking too loud, whereupon said person, during the remainder of the tests with those two instruments on the line, spoke in a tone but slightly louder than a whisper; that is to say, in a very low tone, would only be audible a very few feet in the open air. When commencing to use this tone, he told you through the instrument, that he was speaking not much above a whisper, and thereafter, he continued to speak in that tone to the end of the test.

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[*The examiner certifies that he was present at the time, and that the above statement, as to the tone of voice used by the person operating the instrument reproduced "F" towards the close of the tests on the third day, is substantially correct.*]

Q. Q. 140. Now, after the person speaking into "F," adopted, and while he was using this low tone of voice, but little above a whisper, in the transmitting instrument reproduced "F," did you hear any words and sentences come clearly through the line? If so, will you give an account of it, and state some of the sentences which you so heard?

Ans. After the sounds which I received through the instruments "F reproduced" and the Bell apparatus became very loud, as I mentioned in my previous answer, I could not tell whether the continued excess of loudness was due to the person shouting in the transmitter, or to the peculiar adjustment of that instrument. Consequently, when I continued to receive the speech too loud, I kept sending back instructions through the "tell-tale" line, for the person speaking into the transmitter to use a lower tone of voice. I read from the notes of Mr. Donahoe taken in the front room, where I was, the following conversation received by me through the "F" and Bell instruments, and repeated, and answers sent back through the "tell-tale" line.

Paragraphs marked H. indicate the speech I heard. Paragraphs marked B. indicate the answers I sent back through the "tell-tale" line.

"H. I am speaking very low indeed. Can you hear me read in this tone? What do you think about it?

B. Try it.

H. Well, what do you think about it?

B. Try it. Don't speak so loud.

H. Well, what do you think about it now?

B. That's better.

H. I am speaking; do you hear me?

B. Go on and read—

H. (Not understood.)

B. Repeat that, please.

H. (Again not understood.)

B. I didn't get the last part of it.

H. (Again not understood.)

B. No, the instrument breaks.

H. I said, I am speaking not much above a whisper.

B. I got that clearly.

H. (Not understood.)

B. Too loud; it will take my ear off.

H. (Not understood.)

B. Go on, and read very low.

H. I want to see whether you hear. Do you hear?

B. Yes.

H. Well, shall I read now?

B. Yes, go ahead very low.

H. I read from the *New York Tribune* of yesterday.

B. Go on.

H. (Not understood.)

B. I didn't get all of that. Try it again.

H. I said: 'Repeat what I read, so that I can see whether you get it right or not.'

H. Well, now I will read.

H. (Not understood.)

B. Repeat.

H. (Not understood.)

B. Repeat again.

B. Go ahead with your reading.

H. (Not understood.)

B. No.

H. (Not understood.)

B. No.

H. Tell the man at the telephone to speaker louder to Mr. Ott."

(This last remark was by way of instruction to Mr. Marx, who was transmitting my answers through instrument "F" and the "tell-tale" line, to Mr. Ott, who was then listening at the Bell instrument at the other end of that line.)

"H. Well, I am going to read a little. Do you hear that?

B. Go on.

H. (Not understood.)

B. No.

H. I will read something about Ben Butler.

H. (Not understood.)

B. No.

H. Benjamin F. Butler, of Massachusetts.

H. (Reads something which he repeats, as requested, four times, and is still not understood.)

H. Why the devil can't you hear me when I read, as well as when I talk ?

H. Halloa.

H. (Says something which is repeated twice but is not understood.)

H. Do you hear that ?

B. No.

H. (Says something, which is repeated twice, but not understood.)

H. I am not talking louder than above a whisper.

H. Well, you got that pretty straight.

H. (Not understood.)

B. No.

H. It is expected.

B. Got "it is expected." Did not get the rest.

H. Of the telephone.

H. (Not understood.)

B. No.

H. (Not understood.)

B. No.

H. (Not understood.)

B. No.

H. (Not understood.)

B. No.

H. Well, can you hear me now ?

B. Yes.

H. (Not understood.)

B. No.

H. It is expected that.

B. Heard 'it is expected that.' The rest sounds like 'Judge Blatchford.'

H. (Not understood.)

B. Say it again.

H. Who is talking into the other machine ?

B. Marx is.

Adjourned until Monday, April 3d, 1882, at ten o'clock, A. M.

Monday, April 3d, 1882, *ten o'clock,* A. M.

Examination resumed, pursuant to adjournment.

Present same counsel.

Re-direct examination of Mr. Park Benjamin by Mr. Hill continued.

Q. Q. 141. State whether any and what tests you made on March 28th, 29th, or 30th, with the Drawbaugh instruments "reproduced" "C," or "reproduced" "I," or either of them, and what were the results?

Ans. On March 28th, Drawbaugh's instrument "reproduced" "C" was attached to the line, in the back room, and I listened at Drawbaugh's instrument "reproduced" "I," attached to the same line, in the front room. I heard words and sentences, while so listening, and repeated the same aloud as I so heard them; in order that they might be subsequently verified by the aid of the "tell-tale" line.

It should not be understood, that I received speech uninterruptedly through "C" and "I," or as clearly and distinctly as I afterwards received it through "H" and "A," or "H" and "E," for example, but I did clearly recognize, understand and repeat spoken words and sentences, and thus demonstrated beyond any question the capability of the apparatus to transmit and receive articulate speech by the electric current.

Q. Q. 142. During your recent tests, on any of said three days last mentioned, did you use the Drawbaugh instrument "O"? If so, in what manner, and with what results?

Ans. I did. Instrument "O" was attached in the rear room, and I attached various receivers to the end of the line in the front room, and there listened. The following is taken from notes made in the front room, by a stenographer, of the speech received and repeated by me at that end of the line. Instrument "O" having been attached in the back room, and a Tisdel magneto instrument being applied in the front room, I listened at the latter, and heard as follows:

"H. Yes, I get you distinctly. Do you get me distinctly now?

H. Benjamin, do you hear me now?

B. Yes.

H. Repeat what I say. This is the instrument "O" on the line. Shall I read you a newspaper article?

B. Yes.

H. I will read from the *Boston Daily Advertiser*, of March 27th—not March 27, but March 22nd. Now listen. 'The New York Court experiences much difficulty in attempting to suppress policy-shops, a form of lottery in which Judge Cowing, who addresses the jury—'"

(The Tisdel instrument was now taken off the receiving end of the line, and the Bell hand magneto instrument put on in its place, when I heard as follows:)

"H. Yes. Shall I read again? 'The New York Courts experience much difficulty in attempting to suppress policy-shops, a form of lottery in which Judge Cowing, in addressing the jury, declares, gives not even a shadow of a chance to those who patronize them. Three cases in succession have resulted in a disagreement of the jury, and the Judge confesses that these shops would become soon an unbearable evil if—

B. Repeat.

H. —evil if complaints ended in failure to secure a verdict. The statute and the jurymen evidently both need amending.' That is all of that article."

(Instrument "A" was now put on as a receiver.)

"H. What instruments have you on now?

I will count a few numbers to get the right sound and distance—1-2-3-4-5-6-7-8-9-10. Do you hear that?

H. That is right now. Now I will read from a newspaper. 'General Grant and his wife arrived at the White House to-night on their visit to the President. John Russell Young, the newly appointed minister to China, came with them. Owing to the President's numerous engagements he finds it impossible to give a reception to the Massachusetts—now in the city.'

H. 'It appears to be as certain as anything of the kind can be—'

B. No.

H. '—That Senator Henry M. Teller, of Colorado, is to be appointed Secretary of the Interior. When it was first intimated among the knowing ones that the Western man, who had not been mentioned in connection with a Cabinet position, was to be given that department, there was at once much curiosity in the matter. While the Senator does not affirm or deny the truth of the report, the matter has been pretty thoroughly canvassed during the few days, and the conclusion is that there is no doubt about it. Mr. Teller is now serving his second term, and is nearly at its end. He will go into the Cabinet.'

B. No.

H. He will go into the Cabinet.

B. No.

H. 'If he goes into the Cabinet—'

B. No.

H. 'If he goes into the Cabinet—'

B. No. That last was too weak. Make it stronger.

B. No.

B. No.

H. It will not be—That was not right. 'If he goes into the Cabinet he may not—'

B. Repeat.

H. 'He may not see.

H. He may not seek a good connection—may not seek a re-election. On the other hand his chances of re-election are good.'

B. Try it again.

B. No.

B. Give the whole clause.

H. 'It may affect his chances of re-election—'

B. Something.

B. Not right.

H. 'He may think his chances of re-election improved. He is a man of fair, but not distinguished, ability, very positive in his opinions, an industrious business man. His views on questions are pretty well known. Where he appears disposed to be just, he is not favorable to the proposition that has lately received attention, and appears to be growing in favor. He is strongly opposed to the measure.'

B. Repeat.

H. 'He is strongly opposed to the measure for giving the Indians lands in severalty—for giving the Indians lands in severalty.'

B. That sentence begins with the words "last winter."

H. Now I will go on with the next sentence."

Q. Q. 143. In the ordinary business of the electric speaking telephone, as now known and used for business purposes, is it required to transmit newspaper articles, or is it mainly used for conversational purposes, asking and answering questions?

Ans. Mainly for conversational purposes. I don't know of any more severe test that can be applied to the instrument than that of transmitting newspaper articles; for the reason that such a test not only involves the accurate transmission by the apparatus of the articulate sounds uttered into it, but, to a large extent, the acuteness and readiness of the person receiving to recognize them. It is a well-known fact, I believe, that in ordinary conversational speech but a comparatively small percentage of the words in the language are used. These words become so familiar to the ear that we can recognize and understand them, even when greatly mispronounced, by a foreigner for instance; and under this same analogy a telephone, which would serve all practical purposes for conversation, might easily be found wanting in capacity to make clear to the listener proper names or words not in common conversational use. Nobody talks as a newspaper article reads, unless a previously prepared speech, or something of that kind, is being uttered. And obviously the number of unusual words employed by a writer in deliberately preparing an article is very much greater than those commonly used in every day talk. So also, in hearing an article read to him, a person listening loses greatly the aid of the inflections of the voice, which occur in conversation. In fact, the difficulty of understanding, in the two cases, is nearly as apparent when the words are simply spoken aloud in the person's hearing. Almost anyone, no matter how uneducated, can make himself intelligible in conversation, while to read a newspaper article, or in fact anything written, correctly, so as to convey its entire sense, as well as the proper sound of the words, requires a certain degree of skill. So far as my experience has gone with the telephone system in this city, and I have repeatedly talked over the lines, I very much doubt if an article as long as that, which I heard through Drawbaugh's instruments "H" and "E," could ordinarily be transmitted with as few repetitions and errors.

Q. Q. 144. Is it, or not, true that different persons possessing ordinarily good hearing differ considerably from each other in capacity to accurately hear and understand through a speaking telephone?

Ans. Undoubtedly; I think people differ just as much in their capacity to hear, as they do in their capacity to see or to speak; and I have found in my own case, and, so far as I can learn, the general experience is about the same, that even some little practice with the instrument is required to get the best results. I have met people, however, who apparently didn't hear through any telephone with any degree of certainty; and I have had others listening in turn with me at the same instrument who said that they couldn't distinguish what was said, while I myself heard and recognized every word. This happened in using Bell instruments.

Q. Q. 145. Mention any possible sources of error in the recent tests not properly chargeable to the working of the instruments themselves?

Ans. First, errors resulting from failure to catch and distinguish words, due to noises produced by people moving or speaking in the neighborhood of the instrument, or to the passing of heavy vehicles in the street. The sounds I obtained were frequently impaired by these causes. Second, involuntary bodily movements of the person listening, such as a chance cough, or impairment of hearing due to a cold, or not happening at the moment to have the instrument properly held to the ear. Third, the recorded results of the tests would be, and I think are to some extent, affected by errors in transmission through the "tell-tale" line. The words which I spoke aloud as I received them were repeated into the "tell-tale" line by one person, received by another, and taken down by a third; so that mistakes in understanding might readily occur, especially at the receiving end of that line. As a matter of fact, there were several times when from one cause or another repetitions were required through the "tell-tale" line. I think all of these disturbing causes should be taken into consideration and given proper weight in estimating the final result of the tests.

Q. Q. 146. On one occasion, when Mr. Pope went to the receiving instrument in the front room, and after he had been listening some time and reporting what he heard, the line went suddenly out of operation, to the surprise of the parties in the back room who were transmitting, and after several ineffectual efforts to re-establish communication with Mr. Pope through the line, somebody was sent to the front room to investigate the matter, and it was then discovered that Mr. Pope had accidentally short-circuited the line in some way. Do you know anything about that?

Ans. I think I was in the rear room when that happened, and Mr. Pope at that time was using Drawbaugh's instrument "E" on the test line, in the front room. I instructed the messenger to tell Mr. Pope to look at the uncovered wires, which connected the test line with the instrument, and see whether these were not in contact, thus short-circuiting the line and cutting the current off the instrument. I understood that he so found them, and at once rectified the difficulty. We afterwards wrapped the wires around the case of the instrument and fastened them with string to prevent a recurrence of the accident. The same thing happened to me once while I was using the instrument "E." I think we fastened the wires with string, as stated, on the afternoon of the second day, or morning of the third day, before beginning.

Q. Q. 147. In all these tests of the Drawbaugh instruments, on March

28th, 29th and 30th, what was demonstrated as to their capacity, respectively, to transmit by means of the electric current, the three characteristics or essential conditions of spoken speech; to wit, the variations in "quality," "pitch" and "loudness"?

Ans. In my opinion these tests have demonstrated conclusively the entire capability of all of Mr. Drawbaugh's instruments experimented with to transmit "pitch," "loudness" and "quality" of sound.

Q. Q. 148. In connection with the instrument "F," which requires a very delicate adjustment, did anything occur to confirm the opinion in which I believe the experts on both sides agreed, that an instrument which makes and breaks the electric circuit by means of the sound-waves will not, while so doing, transmit spoken speech intelligibly?

Ans. Yes; on some occasions, while adjusting instrument "F," especially while testing it with the Bell instrument as a receiver, so slight a contact was produced between plate and carbon that the motion of the diaphragm under the influence of the voice would, at times, cause complete separations of said plate and carbon, these separations occurring at very rapid intervals. When this happened the sounds received were entirely unintelligible, being a mere series of noises, often very loud and abrupt.

Q. Q. 149. While you were using the Drawbaugh instruments on the test line did you at any time recognize, through the instruments, the difference in the voices of the persons transmitting in the back room, or the fact that one person had been substituted for another at the transmitting instrument?

Ans. Yes, I recognized quite clearly, for example, the difference between the voices of Mr. Hill and Mr. Drawbaugh, and on one occasion when Mr. Drawbaugh took the place of Mr. Hill at the transmitter, I discovered the fact by the difference in their voices without any other knowledge. I did not make such full tests on this point during the regular trials as I did during some previous experiments, which I conducted while we were repairing the instrument. Then I caused two persons to talk and count into the same instrument alternately, and I found I could distinguish their voices, so as to tell afterwards what each person had said. I did this using instruments "E" and "H," and "E" and a Klemm transmitter; also, I think, with instrument "A" and a Klemm transmitter, and with some others that I don't recall.

[*Mr. Hill offers in evidence the following newspaper articles, and parts of* *newspaper articles, which were used during the tests, the same to be marked respectively:*

"Exhibit	Reporter's Difficult Task,"	*Graphic,*	March 27, 1882.
"	Mrs. Andrews' Death,"	"	" 27, 1882.
"	Massachusetts Factory Operatives,	"	" 27, 1882.
"	Congressional Report,"	"	" 27, 1882.
"	Equity Scheme,"	*Boston Daily Advertiser,*	" 22, 1882.
"	Admission of Dakota,"	"	" 22, 1882.
"	New Wheat Regions,"	"	" 22, 1882.
"	New York Courts,"	"	" 22, 1882.
"	General Grant Personal,"	"	" 22, 1882.
"	General Press Dispatches,"	"	" 22, 1882.
"	Railroad Coal Exchange,"	"	" 22, 1882.
"	Jeannette Dispatch,"	"	" 22, 1882.
"	Senate Proceedings, Mar. 21,"	"	" 22, 1882.
"	House Proceedings, Mar. 21,"	"	" 22, 1882.
"	Recall of Mr. Lowell,"	*N. Y. Tribune,*	" 30, 1882.
"	Annual Conflict,"	"	" 30, 1882.
"	Southern Education,"	"	" 30, 1882.
"	Postmaster General Howe,"	"	" 30, 1882.
"	Benj. F. Butler,"	"	" 30, 1882.
"	Judge Blatchford,"	"	" 30, 1882.
"	Our Washington Dispatches,"	"	" 30, 1882.
"	Underground Telephone Wires,"	The *N. Y. Sun,*	October 30, 1881.
"	Mr. Vanderbilt's Illness,"	"	October 30, 1881.

Re-cross examination by Mr. Storrow:

Re-cross-Q. 150. You read some passages from the long-hand notes of Mr. Marx, and the short-hand notes of Mr. Donahoe. Please let me see those notes from which you read?

Ans. Here they are.

[*Witness hands the notes to Complainants' counsel.*

Complainants' counsel requests the examiner to mark them for identification, and to furnish Complainants' counsel with a copy of them at Complainants' expense.

Defendants' counsel states that notes were taken also on the part of Complainants in both the front and back rooms, and he requests Complainants'

ELEPHONE COMPANY,-2

counsel to furnish him, Defendants' counsel, with a copy of said notes at Defendants' expense.]

Examination taken, reduced to writing, and by the witness subscribed and sworn to before me, this third day of April, 1882.
FRED. M. OTT,
Examiner.

PARK BENJAMIN.

Mr. Hill inquires whether Messrs. Watson and Bell are available for cross-examination at this time.

Mr. Storrow states that those gentlemen are living abroad; that he has heard a rumor that both of them are expected to be in this country in the course of a month; that he understands that Mr. Hill has a right to cross-examine both of them if, and when, they do return, at any stage of the case, and that when he learns of their return, he will notify Mr. Hill for that purpose.

Mr. Hill states that he reserves that right in closing his testimony.

Mr. Hill requests Complainants' counsel to reproduce the tests which are said to have been made at Boston with instruments embodying Professor Bell's alleged invention of the telephone in its earlier form, and if possible, with the identical instruments used in that test. He refers to that test of which evidence has been given on the part of the Complainants, as having been made at No. 40 *State street, Boston, Massachusetts, and elsewhere, for the purpose of demonstrating the capacity of those earlier forms of instruments to transmit articulate speech. And Mr. Hill desires an opportunity to have his expert present at such tests, and, if he shall then elect to examine his expert as to such tests, he wishes to reserve the right so to do.*

Mr. Storrow states, that said instruments all have membrane diaphragms, and were made about three years ago; that they have been used in various suits; and that many, or all of them, have become broken; but that he has intended to invite the Defendants to witness tests of the character referred to, and will do so.

Mr. Hill states, that, with the reservations above noted, Defendants now close the evidence in support of their answer.

This deposition has been begun within the time limited for Defendants to close their testimony, and it is now agreed that it shall stand with the same effect as if completed within that time.

AMERICAN BELL TELE

Dauphin County, } ss:
State of Pennsylvania. }

I hereby certify that the foregoing depositions of witnesses, on behalf of Respondents, were begun at Harrisburg, Dauphin county, aforesaid, on the nineteenth day of April, A. D., 1881, and continued by adjournment, to the times and places set forth, in the foregoing record; and that the several witnesses were duly qualified by me, and subscribed their several depositions in my presence, as above set forth.

Witness my hand and seal, this 28th day of April, 1882.

FRED. M. OTT,
Examiner.

ELEPHONE COMPANY,-2

AMERICAN BELL TELEPHON

HONE COMPANY,-3

United States Circuit Court,

SOUTHERN DISTRICT OF NEW YORK.

AMERICAN BELL TELEPHONE CO. ET AL.

v.

THE PEOPLE'S TELEPHONE CO. ET AL.

EVIDENCE FOR COMPLAINANTS.

Vol. I.—EVIDENCE.

BOSTON:
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1882.

AMERICAN BELL TELEPHON

COMPLAINANTS' CASE.

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Circuit Court of the United States,

SOUTHERN DISTRICT OF NEW YORK.

IN EQUITY.

AMERICAN BELL TELEPHONE COMPANY ET AL.
v.
THE PEOPLE'S TELEPHONE COMPANY ET AL.

BILL OF COMPLAINT.

To the Honorable the Justices of the Circuit Court of the United States for the Southern District of New York:

The American Bell Telephone Company, a corporation
duly established under the laws of the Commonwealth of
Massachusetts, and the Metropolitan Telephone and Telegraph
Company, a corporation duly established under the
laws of the State of New York, bring this their bill of
complaint against the People's Telephone Company, a
corporation organized under the laws of the State of New
York, Joseph Loth, Julius Bien, Marcus Marx, Auguste
H. Girard, John N. Goodwin, Frank A. Klemm, and
Ernest Marx, all of the city and State of New York; 1
Edgar W. Chellis, of Harrisburg, in the State of Pennsylvania,
Richard C. McCormick, of the Territory of
Arizona, Henry D. Cook, Jr., of the city of Washington,
in the District of Columbia, Max L. Gutmann, of
Rochester, in the State of New York, Moritz Loth, of
Cincinnati, in the State of Ohio, and Simon Wolf, of
Washington, in the District of Columbia. And thereupon
your orators complain and say, that before the seventh
day of March, 1876, Alexander Graham Bell, then of

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2 Salem, in said Commonwealth, being the original and
first inventor of a new and useful improvement in telegraphy,
which was never known or used before his invention
thereof, and which had not at the time of his application
been in public use or on sale for more than two years,
made application according to law for Letters Patent of
the United States to be granted to him therefor, upon
which application, due proceedings being had in all respects,
said Letters Patent were on the seventh day of
March, 1876, granted, issued and delivered to said Alexander
3 Graham Bell, signed by the Secretary of the Interior
and countersigned by the Commissioner of Patents and
numbered 174,465, whereby there was secured to said
Alexander Graham Bell, his heirs, administrators or assigns,
for the term of seventeen years from the seventh
day of March, 1876, the full and exclusive right and liberty
of making, constructing, using and vending to others to be
used, the said improvement, a description whereof is given
in the words of the said Bell, in the schedule annexed to
said patent, and forming a part thereof, as by said patent,
4 numbered 174,465, or a copy thereof here in court to be
produced, will fully appear.

That before the thirtieth day of January, 1877, the said
Alexander Graham Bell, being the original and first inventor
of another new and useful improvement in electric
telegraphy, which was never known or used before his invention
thereof, and which had not at the time of his application
been in public use or on sale for more than two
years, made application according to law for Letters Patent
of the United States to be granted to him therefor; upon
5 which application, due proceedings being had in all respects,
said Letters Patent were, on said thirtieth day of January,
1877, granted, issued and delivered unto said Bell, signed
by the Secretary of the Interior and countersigned by the
Commissioner of Patents, and numbered 186,787, whereby
there was secured to said Bell, his heirs, administrators or
assigns, for the term of seventeen years from the said
thirtieth day of January, 1877, the full and exclusive right

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and liberty of making, constructing, using and vending to others to be used, the said improvement, the description whereof is given in the words of said Bell in the schedule 6
annexed to said last-named patent, and forming a part thereof, as by said patent, numbered 186,787, or a copy thereof, here in court to be produced, will fully appear.

That said Alexander Graham Bell assigned said Letters Patent, numbered respectively 174,465 and 186,787, to Gardiner G. Hubbard, trustee, by deed of assignment dated July 9, 1877, and recorded at the Patent Office July 28, 1877, liber R^{21}, page 399 of Transfers of Patents. That said Gardiner G. Hubbard, trustee, assigned said Letters Patent, numbered respectively 174,465 and 186,787, 7
to the Bell Telephone Company, by assignment dated July 20, 1878, and recorded at the Patent Office, Oct. 3, 1878, liber Y^{22}, page 460 of Transfers of Patents.

That said Bell Telephone Company has granted the same to your orator, the American Bell Telephone Company, by an instrument in writing, dated June 22, 1880, and recorded at the Patent Office, June 24, 1880, liber I^{25}, page 282 of Transfers of Patents.

That the sole right to manufacture electro-speaking telephones under said patents thereby became and still is 8
vested in the said American Bell Telephone Company; that the only right granted to or possessed by any persons other than the said American Bell Telephone Company under said patents has been and is the right to use telephones procured from said American Bell Telephone Company, and its predecessors, upon payment of stated royalties under said two patents to the said American Bell Telephone Company.

That by license under said American Bell Telephone Company, the Metropolitan Telephone and Telegraph 9
Company, a corporation organized under the laws of the State of New York, has acquired the sole and exclusive right to use and to license others to use telephones within a territory which includes all the States of New York and New Jersey within thirty-three miles of New York City

Hall, and all of Monmouth County, New Jersey, and all of
Long Island, and is now engaged in the business of supply-
ing electric speaking telephones and erecting telephone
lines in said territory; which telephones it receives from
10 said American Bell Telephone Company, and for the use
of which it pays a yearly license fee and royalty to said
American Bell Telephone Company, and receives a yearly
royalty and license fee from its sub-licensees.

That electric speaking telephones had never been pub-
licly known or used before the grant of said patent, and were
first publicly made known and first introduced into public
use by said Bell and his licensees under said Bell patent,
and but for the unlawful acts of the defendants and
their associates, hereinafter complained of, your orators
11 would be in the full and exclusive enjoyment of said rights.

Your orators further show, that after the grant of said
Letters Patent, the inventions therein described and
claimed, or substantial and material parts of the same, em-
bodied in instruments known as Bell telephones, and in
instruments known as Blake transmitters, were, before
July, 1877, introduced into general public use by the
said Bell, the said Hubbard, trustee, the said Bell Tele-
phone Company and your orators. That many thousands
of persons have put the said invention into daily use
12 under the authority and license of the said Hubbard and
your orators and their predecessors and those holding
rights or licenses under them, and have paid for such
use of said inventions the amount fixed by the owners of
said patents as a reasonable compensation therefor, such
payments amounting in the aggregate to many thousands
of dollars. That telephone exchanges now exist in more
than two hundred and seventy-five towns and cities of the
United States, and in every State thereof, and exist in sub-
stantially every city in the United States having more than
13 15,000 inhabitants, and in many smaller places; and all
said exchanges use telephones licensed by your orators, the
American Bell Telephone Company, and its predecessors,
as owners of said Bell patents, and pay royalty therefor

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to your said orators. That the fact that said Bell was the original and first inventor of said inventions, and that the patents above named are good and valid patents, have been generally recognized and acknowledged by those who have used the inventions and the public generally, in all parts of the United States, and the claims of the said Bell, Hubbard, and your orators and their said prede- 14
cessors to the exclusive right to the said inventions under said patents have been generally acknowledged and acquiesced in. That from time to time several persons have attempted to make, sell and use telephones, or parts thereof, embracing said inventions, but that in such cases said Hubbard while owner of, and your orators, and their said predecessors, since they have owned said patents, have immediately, upon hearing of such acts or attempts, notified such parties to desist therefrom, and that such parties have generally, upon receiving such notices, complied therewith, 15
and acquiesced in and recognized as valid the claims of said Hubbard and your orators under said patents; and said Bell, said Hubbard and your orators have always asserted and maintained, and but for the wrongful acts of the defendants would and have hitherto almost universally enjoyed the sole and exclusive right to practise said inventions: that they have not acquiesced in any infringement of their exclusive rights; and that the said exclusive rights of your orators are of great value to them.

That there are now in use more than 100,000 electric 16
speaking telephones licensed by and paying royalty to your orators, the American Bell Telephone Company; that the owners of said Bell patents, and those who now are or heretofore have been licensed by them, have devoted great time and attention and large sums of money to the development of the telephone and the introduction thereof into extensive use, and to the proper construction of the most suitable telephone lines and systems, and telephonic appliances, and have constructed many thousand miles of telephone lines for use with telephones owned by your orators, 17
the American Bell Telephone Company, and licensed by it

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for such use, and that nothing which the defendants, or F. A. Klemm, A. G. Tisdel, and D. A. Drawbaugh (hereinafter named) have done, has contributed in any substantial way to the development of the telephone, or the introduction thereof into use.

That in the year 1878 Addison D. Hard, of Boston,
electrician, infringed said Bell patents by making and
selling telephones, or by making and selling the material
18 and substantial parts thereof for the purpose of being put
together and used as telephones; that thereupon the said
Bell Telephone Company brought their bill in equity
against him, in the Circuit Court of the United States for
the District of Massachusetts; that an injunction was
issued against him to desist from such infringement; and
afterwards, and after hearing, the defendant was adjudged
in contempt for violating said injunction, and was ordered
to pay a sum of money into court, which sum was afterwards,
to wit, Feb. 4, 1879, ordered to be paid, and was
19 paid to said Bell Telephone Company.

That in the year 1878 one Jerome C. Redding also infringed said patents, and a bill in equity was brought against him in said court to restrain said infringement, and no defence was made, and an injunction issued, and said Redding desisted from further infringement.

That in the year 1878 one Jesse H. Bunnell, manufacturing
electrician, did, in the city of New York, in like
manner infringe said Bell patents; that thereupon the said
Bell Telephone Company brought their bill in equity
20 against him in the Circuit Court of the United States for
the Southern District of New York; that he appeared
thereto by counsel; that thereafter he submitted to the
claims of the plaintiff; and that on the eighth day of
February, 1879, an injunction was issued against him,
restraining him from further infringement of said patents,
and no further proceedings have been had in said cause.

That in the year 1878 Charles E. and William H. Jones, manufacturing electricians, did, in the city of Cincinnati, in like manner infringe said Bell patents; that thereupon the

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said Bell Telephone Company brought their bill in equity 21
against them in the Circuit Court of the United States for
the Southern District of Ohio, on said two patents; that
they appeared thereto by counsel; that thereafter they submitted
to the claims of the plaintiff; and that on the thirteenth
day of December, 1878, a decree and injunction was
issued against them, declaring the validity of said two Bell
patents, and restraining them from further infringement
thereof, and ordering an account of damages and profits;
and no further proceedings have been had in said cause.

That in the year 1880, Pearce & Jones, manufacturing 22
electricians, did in the city of New York infringe said
Bell patents, by making and selling instruments of the
form and character known as magneto-telephones, and
which operated by varying the electro-motive force by
magnetic induction, and by making instruments of the
form and character known as battery telephonic transmitters,
which operated by varying the resistance of a circuit
supplied with electro-motive force from a battery; that
thereupon your orators brought their bill in equity against
them in the Circuit Court of the United States for the 23
Southern District of New York, and moved for a preliminary
injunction on said two patents; that they appeared
thereto by counsel, and asked for additional time to prepare
affidavits in defence to said motion; that the Court thereupon
ordered an injunction or restraining order to issue,
and allowed said defendants further time to file affidavits,
with leave to have a hearing thereon on a day named; that
on said day named, to wit, Aug. 10, 1880, the said
defendants appeared by counsel and declined to contest
said case further, and submitted to a decree declaring the 24
validity of said two patents, and perpetually enjoining
said defendants from infringing the same, and ordering an
account of damages and profits; and that such decree was
made by order of said Court, on or about the tenth day of
August, A. D. 1880; and such injunction was ordered
and issued accordingly by order of said Court, on the
eleventh day of September, A. D. 1880; and no further
proceedings have been had in said cause.

That in the year 1880, the Eaton Telephone Company,
25 a corporation established under the laws of the State of
New York, did in the city of New York in like manner
infringe said Bell patents, by making and selling instruments
known as magneto-telephones or telephonic battery
transmitters as aforesaid; that thereupon your orators
brought their bill in equity against it and others in the
Circuit Court of the United States for the Southern District
of New York on said patents, and moved for a preliminary
injunction; that said motion came up for hearing
on Aug. 10, 1880; that thereupon said defendants appeared
26 by counsel and asked for further time to file affidavits in
defence to said motion, which time was allowed them until
Sept. 15, 1880; and on said day said defendants declined
to file and did not file affidavits, and declined to contest
said motion, and thereupon a preliminary injunction was
ordered and issued against them restraining them, their
agents and servants, from infringing said patents; and no
further proceedings have been had in said cause.

And at or about the same time your orators the American
Bell Telephone Company brought their bill in equity on
27 said two patents in the Circuit Court of the United States
for the District of Massachusetts, against Albert Spencer,
an agent and employé of said Eaton Telephone Company,
and against Enoch Waite, a user of telephones made by
said Eaton Telephone Company; said Waite declined to
contest said suit; said Spencer appeared by counsel and
asked for and obtained time to prepare and file affidavits,
and thereafter declined to file affidavits, and submitted to a
preliminary injunction in like manner as said Eaton Telephone
Company did as aforesaid.

28 That in the year 1880, one J. L. Lazelle, a manufacturer
of electrical apparatus in the city of New York, did,
in the city of New York, in like manner infringe said
patents by making and selling magneto-telephones called
the Lazelle telephone, and by making and selling battery
transmitting telephones, called the Little Gem Transmitters;
that thereupon your orator brought its bill in equity against

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said Lazelle, in the Circuit Court of the United States for the Southern District of New York, on said patents, and moved for a preliminary injunction; that said motion came up for hearing on the day of October, 1880; that the said 29
defendant made default, and thereupon an injunction was ordered and issued against him, restraining him, his agents and servants, from infringing said patents; and no further proceedings have been had in said cause.

That all said orders and decrees stand in full force and effect.

That none of said parties so enjoined as aforesaid have been licensed under said Bell patents, and, as your orators believe, they have entirely refrained from making and selling and using telephones, or in any way infringing said patents 30
since the making of said decrees respectively.

That the said exclusive rights of said Bell, and your orators and their predecessors as his assigns and grantees, have never been openly or publicly violated, except at one time and in the year 1878, by the Western Union Telegraph Company, and by the Gold and Stock Telegraph Company, and by the American Speaking Telephone Company, said three corporations having associated themselves together for that purpose; that said Bell Telephone Company brought its bill in equity in the Circuit Court of the United States for 31
the District of Massachusetts, against Peter A. Dowd, an agent of said associated companies, engaged in the business of using their infringing telephones, and in said suit complained of the defendant that he had infringed the fifth claim of said patent 174,465; and also complained that he had infringed the third, sixth, seventh and eighth claims of said patent 186,787; the said associated corporations assumed the defence of said suit, and employed in said defence their counsel and experts learned in the law and skilled in the art; in said suit evidence was 32
taken and completed by the complainants in chief, and by the defendant in defence, and by the complainants in reply; and thereupon, upon consideration of said proof, and the opinions of their professional advisers, the defendant and

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said corporations became satisfied that said Bell was the
true, original and first inventor of the electric speaking
telephone, and the inventions covered by said patents;
whereupon they submitted to the said claims of the com-
plainants, and agreed to desist from further infringements,
33 and have since desisted from further infringements, and
placed and caused to be placed all telephones within their
power or control under license under said Bell patents, and
paid, or caused to be paid, the usual and customary yearly
royalties therefor habitually charged by the assigns of said
Bell to other parties for like uses, and agreed that they
would not thereafter make electric speaking telephones,
and would not thereafter use electric speaking telophones,
except such as should be made and furnished to them by
your orators or the assigns of said Bell, and under license
34 under said Bell patents, and that for the use of the same
they should pay not less than the usual and accustomed
royalties from time to time charged to others by your
orators.

And your orators show that the telephones made by your
orators and the infringing telephones of the defendants are
small instruments, and easily concealed, and easily used
in private, and easily transferred from one person to an-
other, so that it is generally extremely difficult for your
orators to detect all instances of such use and extremely
35 difficult to prove the use thereof by persons not licensed by
your orators, and the extent of such use, and would be
extremely onerous and burdensome for your orators to
bring separate suits against each user to restrain said in-
fringing use; and so, if the defendants, or any of them,
shall be allowed to continue to manufacture and supply
such instruments for use during the pendency of this suit,
your orators will be wholly without adequate remedy in
the premises.

Yet the defendants, well knowing the premises and
36 the exclusive rights of your orators as aforesaid, but con-
triving to injure your orators and to deprive them of the
benefit and advantage which might and otherwise would

accrue to them from said inventions, without the license or consent of your orators, and in infringement of the said patents, have, as your orators are informed and believe, made, sold and used telephones embracing the inventions secured to your orators in said Letters Patent, or substantial and material parts of them, and have used the several improvements secured to your orators by said patents, and are still using the said several improvements at the city of 37 New York, and divers other places within said district, and have furnished electric speaking telephones made by them to a considerable number of persons within this district, to be connected up, and used as electric speaking telephones for the transmission of articulate speech, by and according to the method secured to said Bell and to your orators by said patents, and still continue so to do; but precisely how long the defendants have made, sold and used the said several improvements, and to what extent they have made, sold and used them, your orators, for want of 38 a discovery thereof, do not know and cannot set forth, and they pray that the defendants may be compelled to set forth the same in their answer.

Your orators, upon information and belief, aver and charge that F. A. Klemm and A. G. Tisdel claimed to have made certain alleged improvements in electric speaking telephones, and applied for patents therefor; that the defendants Klemm, Wolf, Ernest Marx, and Moritz Loth acquired the ownership of said alleged inventions; that thereafter patents of the United States issued on said appli- 39 cations, or some of them, to wit, patent 227,270, dated May 4, 1880, to said four defendants on an improvement in telephonic battery transmitters, alleged to have been invented by said Klemm, and patent 227,861, dated May 18, 1880, to the same persons, on an improvement in magneto telephones, alleged to have been invented by said Tisdel; that after said purchase of said inventions the said defendants, being well aware that any electric speaking telephone apparatus which would embody said improvements would infringe your orators' said patents, and particularly the first 40

Bell patent 174,465, and thereafter, hearing that one Daniel
Drawbaugh, of or near Harrisburg, Pa., claimed that
he had made some experiments relating to electric speaking
telephones (which experiments if made were incomplete,
imperfect, unfruitful, and were long before abandoned),
entered into an arrangement with him to set up
and claim that he was the first inventor of the speaking
telephone, and to make application for a patent therefor.
And thereafter alleging and pretending that said Drawbaugh
41 was the original and first inventor of the electric speaking
telephone, and that electric speaking telephones had not
before such application been in public use or on sale for
more than two years with the knowledge and consent of
said Drawbaugh, they did, on or about the twenty-first day
of July, 1880, induce him to make and cause to be filed in
the Patent Office of the United States, an application for
a patent to issue to them as assignees of said Drawbaugh
as the first and original inventor of the electric-speaking
telephone, the said defendants well knowing at the time
42 that electric-speaking telephones had been in public use by
your orators and the licensees of your orators for more
than two years before said application; all of which claims
and pretences your orators charge to be wholly unfounded
and untrue.

And further to carry out their plans, the said defendants,
or some of them, did associate with themselves the other
individual defendants, and did, on or about the thirty-first
day of August, 1880, form or undertake to form a corporation,
under the laws of the State of New York, having
43 its principal place of business and office in the city of
New York, with a nominal capital of $5,000,000, called
"The People's Telephone Company," of which, by the
articles of association, the defendants, Edgar W. Chellis,
Joseph Loth, Julius Bien, Marcus Marx, Auguste H.
Girard, John N. Goodwin, Richard C. McCormick, Henry
D. Cook, Jr., and Max L. Gutmann, are declared to be
and in fact became the trustees and directors, for the declared
purpose of manufacturing, selling and using telephones,
under and in accordance with what they pretend

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are the inventions and improvements of said Klemm, Tisdel and Drawbaugh. 44

Your orators aver and charge that the infringing telephones made and sold and threatened to be made and sold by the defendants conform to the improvements and forms alleged to have been devised by said Klemn and Tisdel before they knew of said Drawbaugh's alleged inventions, and do not copy or conform to the forms experimented with by said Drawbaugh as of his own invention.

And your orators aver that said pretended inventions of said Drawbaugh (if ever made by him) have not been 45
by him, or any one claiming under him, introduced into public use, and that knowledge thereof has been withheld from your orators, and from the public, except so far as they have been disclosed within the three months last past by certain newspaper publications.

Your orators aver and charge that the defendants, or some of them, caused to be published the following newspaper articles, or furnished for publication the matter therein contained, on or about the date of the publication thereof:

[*From the Cincinnati Commercial of July* 22, 1880.] 46

"TELEPHONE COMBINATION.

"*Special to Cincinnati Commercial.*

"WASHINGTON, D. C., July 21. — An application for a patent was filed to-day that, in consequence of its vastness of interest, as well as wealth of prospect, renders it a subject of national interest. A company of leading business men had been formed, that has bought up all the telephone patents antedating those now in use, and known as the Bell, Gray and Edison patents. The company is composed of leading business men from all parts 47
of the country, Cincinnati being largely represented and interested. The cash capital of the company is $5,000,000, with headquarters in New York, and in about sixty days they will open up the telephone, which will certainly result in the driving out of all telephones in the market,

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save the ones they hold, or else the compelling the Gray,
Bell and Edison lines to pay the new company a munificent
royalty. It appears from the testimony now on file
and in the possession of the new company, which is conclusive
48 and exhaustive, that the inventor of the telephone
is a poor mechanic, living near Harrisburg, Pa., named
Daniel Drawbaugh. Owing to his poverty, he was unable
to push his patent on the market. The new company have
secured and are sole possessors of this invention, antedating
those now in use. They are alse owners of four patents
for telephones issued to Mr. Klemm, of New York.
A large number of capitalists were here to-day to see the
filing of the application, and they assert, with a positiveness
that is almost convincing, that it will not be long till
49 they have entire charge of the telephones, not only in this
country but in the world, and that they will be able to
establish lines by which messages can be transmitted for
almost a song."

"Mr. Lipman Levy, of the law firm of Moulton, Johnson
& Levy, of Cincinnati, was here to-day in the interest of
the Cincinnati parties, who, as already stated, are among
the most prominent financial men of our city."

[*From the New York Journal of Commerce of Monday, Aug.* 23, 1880.]

50 "A New Telephone Company. — A company has recently
been formed in this city with a capital of $5,000,000,
for the purpose of manufacturing telephones. The company
is to be known as The People's Telephone Company,
and a number of leading capitalists in this city and Cincinnati
are interested in it. The telephones are to be manufactured
under the patents of Frank A. Klemn and Abner
G. Tisdel, and the application for patents of David
Drawbaugh, of Eberly's Mills, Cumberland County, Pa.,
filed July 21, 1880. It is claimed by those interested in
51 the new enterprise that Drawbaugh is really the inventor
of the telephone, and had completed one years before Professor
Bell or any one else had manufactured one. He

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was, however, in very humble circumstances, and his neighbors who knew of his experiments looked upon him as a harmless lunatic. He continued improving his original telephone, and it is claimed that the one which the new company proposes to furnish is superior to any now in use. The company has fitted up a factory in Brooklyn, and in three months will be prepared to supply 1,000 of the new telephones. As soon as operations are actively commenced, 52
it is expected that legal proceedings will be begun against the new company by the Gold and Stock Telegraph Company, which holds most of the existing patents, and a long and interesting legal fight is anticipated."

Your orators have requested the said defendants to acknowledge their rights in the premises, and to desist and refrain from the said acts, and from disregarding and infringing your orators' said rights, and to account with and pay to your orators what is justly due to your orators by reason of said infringement. 53

But now so it is, may it please your Honors, that the defendants wholly refuse so to do; but, on the contrary, continue and threaten to continue said infringement of the rights of your orators aforesaid, and particularly threaten to make and put out other like instruments, and thereby cause irreparable injury to your orators' lawful business. All which is contrary to equity and good conscience.

To the end, therefore, that the said defendants may if they can show why your orators should not have the relief herein prayed, and may upon their oaths, and according to their 54
best and utmost knowledge, remembrance, information or belief, full, true, direct and perfect answer make to all and singular the matters hereinbefore stated and charged, as fully and particularly as if the same were here repeated, and they especially interrogated as to each and every of said matters, and more especially may answer, discover and set forth whether during any and what period of time, and whether at said New York or elsewhere, and when and where they used said improvements, or either of them;

AMERICAN BELL TELEPHO

55 and whether they manufactured or sold any electric
speaking telephones or apparatus to transmit speech by
electricity, or the various parts of such telephones, and how
many they have made or sold, and to whom they have sold
the same, and how the said telephone and the several parts
of the same are constructed and used.

And your orators show that they are entitled to restrain
all further use of telephones which have been or shall be
manufactured and disposed of by the defendants or either
of them, and to receive and collect from each user thereof
56 a suitable sum as and for damages and profits in consequence
of and growing out of such use by each person who
has used the same; and not waiving said rights, but wholly
insisting thereon, and asserting that they intend to pursue
and enforce said rights against said users, your orators aver
that the defendants are also liable to pay to your orators
other sums as and for profits by them actually realized by
and from said infringement and unlawful acts. Wherefore
your orators pray that the defendants may be decreed to
account for and pay over to your orators all such gains and
57 profits resulting to them from said infringements; and may
be restrained, together with their servants and agents, by
an injunction, to be issued out of this honorable Court, or
by one of your Honors, according to the law in such case
provided, from making, selling or using the said improvements,
patented as aforesaid, or either of them; and that
they may also be enjoined and restrained as aforesaid, during
the pendency of this suit, and for such other and further
relief in the premises as the nature of the case may
require and to your Honors shall seem meet.

58 May it please your Honors to grant unto your orators
not only a writ of injunction but also a writ of *subpœna*,
to be directed to the said defendants and each of them,
commanding them and each of them, at a certain time and
under a certain penalty, therein to be limited, personally
to be and appear before your Honors and this honorable
Court then and there to answer unto this bill of com-

PHONE COMPANY,-3

plaint, and to do and receive what to your Honors shall seem meet in the premises.

AMERICAN BELL TELEPHONE CO.
W. H. FORBES, *President*.

METROPOLITAN TELEPHONE AND TELEGRAPH CO.
W. H. FORBES, *President*. 59

DICKERSON & DICKERSON,
Solicitors.
E. N. DICKERSON,
CHAUNCEY SMITH,
J. J. STORROW,
Of Counsel.

UNITED STATES OF AMERICA,
STATE OF MASSACHUSETTS, } SS.
SUFFOLK COUNTY, Oct. 19, 1880.

Personally appeared William H. Forbes, above named, 60
and, having been duly sworn, doth depose and say, that he is president of said American Bell Telephone Company, and of said Metropolitan Telephone and Telegraph Company, and of said Bell Telephone Company; that he has read the foregoing bill and knows the contents thereof; that all the matters therein stated as to the acts of said three corporations he knows to be true; that all other matters therein stated he believes to be true; and believes the said Bell to be the true, first and original inventor of the improvements in said two patents set forth and claimed; 61
and that the same had not been in public use or on sale two years before his respective applications for said two patents.

Sworn to before me,
[SEAL] GEO. WILLIS PIERCE,
Notary Public.

Filed Oct. 20, 1880.

REPLICATION.

CIRCUIT COURT OF THE UNITED STATES,

SOUTHERN DISTRICT OF NEW YORK.

IN EQUITY.

62 AMERICAN BELL TELEPHONE COMPANY ET AL.

v.

PEOPLE'S TELEPHONE COMPANY ET ALS.

The replication of the above-named complainants to the answer of the People's Telephone Company, Marcus Marx, Auguste H. Girard, John N. Goodwin, Frank A. Klemm, Richard C. McCormick, Julius Bien and Simon Wolf.

These repliants, saving and reserving unto themselves all
and all manner of advantage of exception to the manifold
63 insufficiencies of the said answer, for replication thereunto
say that they will aver and prove their said bill to be true, certain and sufficient in the law to be answered unto; and that the said answer of the said defendants is uncertain, untrue and insufficient to be replied unto by these repliants; without this, that any other matter or thing whatsoever in the said answer contained material or effectual in the law to be replied unto, confessed and avoided, traversed or denied, is true.

All which matters and things these repliants are and will
64 be ready to aver and prove as this honorable Court shall
direct, and humbly pray as in and by their said bill they have already prayed.

DICKERSON & DICKERSON,
Complainants' Solicitors.

Filed Feb. 7, 1881.

AMERICAN BELL TELEPHO

PHONE COMPANY,-3

United States Circuit Court,

SOUTHERN DISTRICT OF NEW YORK.

IN EQUITY.

American Bell Telephone Co. et al.
v.
People's Telephone Co. et als.

EVIDENCE FOR COMPLAINANTS.

TAKEN PURSUANT TO THE SIXTY-SEVENTH RULE OF THE SUPREME COURT OF THE UNITED STATES, IN EQUITY, AS AMENDED, BEFORE ME,

CHARLES H. SWAN, *Examiner.*

Boston, Feb. 16, 1881.

Present: James J. Storrow, Esq., *of Counsel for Complainants;*
Lewis Abraham, Esq., *of Counsel for such Defendants as have been served with Subpœna in this cause, or have heretofore appeared or answered.*

Counsel for complainants offers in evidence the following documentary evidence: —

An Office copy of Letters Patent No. 174,465, granted Alexander Graham Bell, March 7, 1876, and marked "Exhibit Bell Patent, No. 174,465."

An Office copy of Letters Patent No. 186,787, granted Alexander Graham Bell, Jan. 30, 1877, and marked "Exhibit Bell Patent, No. 186,787."

A certified copy of assignment, Alexander Graham Bell to Gardiner G. Hubbard, dated July, 1877, recorded in Book R^{21}, page 399, of Assignments of Patents.

A certified copy of assignment, Gardiner G. Hubbard to Bell Telephone Company, dated July 20, 1878; recorded Book Y^{22}, page 460, of Assignments of Patents.

A certified copy of assignment, Bell Telephone Company to American Bell Telephone Company, dated June 22, 1880; recorded Book I^{25}, page 285, of Assignments of Patents; marked "Exhibit Assignments."

[*Defendants' counsel admits the execution of the above assignments.*]

A certified copy of the charter of the American Bell Telephone Company, and a certified copy of the certificate of its organization, from the secretary of the Commonwealth of Massachusetts.

Complainants' Counsel also puts in evidence the instruments: "Complainants' Exhibit Klemm Battery Telephone, E. L. Bradley," and "Complainants' Exhibit Tisdel Magneto Telephone, E. L. Bradley," heretofore filed in this case, and referred to in the affidavit of Edward L. Bradley, and in the affidavit of Charles R. Cross, heretofore filed in this case, to be used upon an application for a preliminary injunction.

DEPOSITION OF CHARLES R. CROSS.

Direct Examination by JAMES J. STORROW, Esq., *of Counsel for Complainants.*

Int. 1. State your name, age, residence, and occupation.

Ans. Charles R. Cross; I am thirty-two years old; I live in Boston, and am Thayer Professor of Physics in the Massachusetts Institute of Technology.

Int. 2. State how long and to what extent you have been engaged in the study of the physical sciences; and to what extent, if at all, you have been accustomed to make experiments in the several branches of physics, especially those relating to electricity and acoustics.

Ans. I have been an instructor at the Institute of Technology

PHONE COMPANY,-3

during the past ten years, and during that time I have been constantly engaged in the study of various branches of physics. During the past eight years I have especially investigated the subjects of acoustics and certain branches of electricity. In the prosecution of my studies during this time I have constantly been engaged in the experimental study of the subjects mentioned, and have been practically familiar with all the apparatus ordinarily used by scientific men in the investigation of sound and electricity.

Int. 3. What attention have you given to the speaking telephone and to its principles and mode of operation?

Ans. I have been familiar with the rise and development of the speaking telephone from its very beginning, having been in frequent communication with Professor Bell ever since the winter of 1873–4. I am familiar with Mr. Bell's patents, have investigated with great care the theory upon which these patents are based; and am practically familiar with the construction and use of the various forms of instruments constructed in accordance with said patents. During the past two years, I have conducted a very extensive series of experiments relating to the different branches of telephony, in the capacity of expert for the Bell Telephone Company.

Int. 4. State whether or not you have testified as a witness in any cases in the courts of the United States upon the principles of the invention embodied in patents, and in machines or apparatus.

Ans. I have done so frequently.

Int. 5. You say you have been familiar with Mr. Bell's patents. State whether or not among these patents are those which have been introduced in evidence in this case marked "Exhibit Bell Patent No. 174,465," and "Exhibit Bell Patent No. 186,787."

Ans. The patents No. 174,465 and No. 186,787 are among those which I have had frequent occasion to examine.

Int. 6. Referring to the patent No. 174,465, will you explain the mode of operation of the apparatus referred to in the fifth claim of the patent; explaining, as far as may be necessary, the character of sounds, their action upon the apparatus, and the manner in which the apparatus operates to produce the results which are ascribed to it in the patent?

Ans. The sensation of sound is produced by the action upon the ear of the vibrating particles of air which are set into a vibratory, or to-and-fro motion, by the vibrations of the sounding body. The primary impulse given by the sounding body to those particles of air immediately in contact with it, is gradually transmitted from particle to particle, in consequence of the elasticity of the air, or other medium through which the sound passes. In consequence of the mode of action of the elasticity of the air, the motion originally communicated to the particles of air in contact with the sounding body is not transferred instantaneously to all the other particles; but in consequence of their *inertia*, as the sounding body vibrates to and fro, a similar movement is impressed upon one after the other of the particles surrounding it. This to-and-fro motion of the vibrating body generates a similar minute to-and-fro motion of the air particles, so that they are alternately crowded more closely together, and separated more widely from each other, thus producing alternate condensations and rarefactions in the air. It is to these alternate condensations and rarefactions that the term "sound wave" is given. It will be observed that each particle vibrates to and fro in a straight line in the direction in which the wave motion is propagated. If we consider that the vibration of the air particles is produced immediately by the vibration of the sounding body, we see that the motions of the air particles must be a perfect copy of the motions of the particles of the vibrating body. Such vibrations may differ in three separate ways, viz., in the extent of the path of the vibrating particle, in the frequency of its vibration, and in the character of its vibration. It is evident, in the first place, that the vibrating particle may, in its to-and-fro motion, traverse a longer or shorter path; in the second place, it may traverse this path a greater or less number of times in each second, that is, its rate of vibration may differ; in the third place, while traversing its path it may move according to different laws of acceleration or retardation of its velocity: for example, its acceleration during a part of its course may be, andin some cases is constant, or the rate of acceleration may constantly change, and the law of its change may vary in different ways. To the changes in motion thus caused, what I have called the peculiar character of the vibration is due. If we consider these three kinds of variation, in their effect upon the senses, we find that variations in the extent of the path or amplitude of vibration of the particle determine, other things being the same, the loudness of the sound; the variations in the frequency of vibration determine the pitch of the sound; and variations in the character of the vibration determine what is known as the quality, or *timbre* of the sound.

In the statements which I have just made I have spoken of the motion of a single particle; but it is evident, from the mode of transmission of sound, that all of the particles of the air through which the sound is conveyed partake of the various characteristics of vibration which I have discussed.

I have used the term "quality or *timbre*"; quality is that peculiarity of a sound by which, independently of its pitch or loudness, we are enabled to determine the instrument by which the sound is produced; thus, for example, the note of a violin differs from the note of a flute in quality, even though the two are the same in pitch and loudness.

It is well known to scientific men that these differences in quality, which, as I have said, are due to differences in the character of the motions of the vibrating particle, are produced acoustically by the combination of a number of separate or partial tones, which can be shown to be produced when a particle is in vibration; and which partial tones differ in number, in pitch and in intensity or loudness, in accordance with differences in the character of the motion of the vibrating air particles.

The lowest of these partial tones is called the "fundamental," the other and higher notes "overtones." Hence it is evident that the quality of a sound depends upon the relative pitch, intensity and number of partial tones present. In a very few exceptional cases only the fundamental is present, and what is called a simple sound is produced. In general, the pitch of a note is determined by the fundamental, the overtones determining the quality. These facts, constituting what is known as Helmholtz's Theory of Quality, were first discovered by the physicist whose name the theory bears. The human voice owes its peculiar quality to the presence of great numbers of these partial tones; and very slight changes in the partial tones will produce very considerable changes in the voice.

From what I have said thus far, it will be seen, that in order to reproduce articulate speech, we must be able to reproduce, in the air, vibrations which shall possess all these characteristics of pitch, intensity and quality; and which shall, moreover, possess those same characteristics of pitch, intensity and quality; that is, of rate of vibration, amplitude of vibration, and character of vibration, which are possessed by the vibrating particles which are set in vibration directly by the organs of speech. If we can determine the speed and direction of motion of an air particle at each instant, and hence, also, the extent of its path, we can evidently impress upon it all three of the characteristics that I have mentioned; and hence can produce any desired sound at will.

In Mr. Bell's patent No. 174,465, a method is described by which the motions which are produced in the air at one place, the transmitting station, can be reproduced by an electrical method of intercommunication at the receiving station. By means of his invention he is able, by the use of certain electrical apparatus, to impress upon the particles of air at a distant place, the receiving station, motions substantially identical with those which are immediately impressed by the voice upon the particles of air at the transmitting station.

According to the specification, he effects this result by the use of the transmitter, which takes up from the air at the transmitting station the motions which are impressed upon it by the voice of the speaker, and the vibrating portion of which transmitter moves in substantial accordance with the movements of the air particles themselves. This transmitter, being connected with a line wire joining the two stations between which speech is to be transmitted, is enabled, by its electrical connection with that wire, to produce in it electrical variations which correspond to and are similar in form to the motions of the movable part of the transmitter, and hence to the motions of the air particles which have actuated the movable part of the transmitter. These electrical variations, in their turn, set in motion a movable part of a receiving instrument with which the line wire is connected, and in their turn produce in this movable part of the receiver vibrations corresponding to and similar in form to those electrical vibrations by which they are produced, and hence to the motions of the air particles at the transmitting station. The movable part of the receiving instrument, thus vibrating, impresses upon the air at the receiving station vibrations similar in form and corresponding to its own motions.

The motions thus produced in the air particles at the receiving station are therefore evidently similar in form, and correspondent to the original vibrations impressed upon the air at the transmitting station by the voice of the speaker at that station. This being the case, it is evident, from what I have said, that the sound uttered by the speaker at the transmitting station will be reproduced at the receiving station.

It appears from these facts that Mr. Bell's apparatus consists essentially of a transmitter adapted to take up the vibrations of the air at the transmitting station; a line wire connecting the transmitting with the receiving station, together with a battery or some other form of electrical apparatus, which is capable of furnishing a supply of electricity; which line wire shall serve to transmit the electrical variations produced by the transmitter from one station to the other; and a receiver which, actuated by the electrical variations thus transmitted by the line wire, shall be caused to reproduce the motions of the transmitter and of the air particles by which that transmitter is actuated. It is true that the receiving instrument may not always reproduce the vibrations of the air particles at the transmitting station in every minute detail, but the instrument is a speaking telephone only so far as it is adapted to reproduce those motions with substantial fidelity; and its practical construction and reproduction must be such that these vibrations shall be substantially reproduced.

It is evident that when the transmitter is in operation, variations in the electrical current may take place in three ways, — there may be a variation in either the direction of the current; the rate or violence of change of the current; and the frequency of change of the current: and from these three kinds of variations similar variations in the direction, rate and frequency of change of the motion of the movable part of the receiver will result. And hence, from these different electrical variations, differences in the quality, intensity and pitch of the sound produced by the receiving instrument will follow. Therefore, to reproduce articulate speech or any other sound in all its characters of pitch, intensity and quality, it is necessary that the movable portion of the receiving instrument should be constantly under the guidance of, and controlled by, the movable portion of the transmitting instrument; and in case this constant control is not exercised, and in precisely that degree in which it ceases to be exercised, the instrument becomes incapable of transmitting articulate speech.

No form of transmitter which operates by making and breaking an electrical circuit can possibly transmit articulate speech, or any other sound in its different characteristics of pitch, intensity and quality; for the reason that the constant control of which I have spoken is not exercised in such an instrument. With any circuit-breaking instrument the loudness and quality of the sound produced at the receiving station are dependent solely upon the physical construction and action of the receiving instrument itself, and of the battery or other source of electricity by which the transmitter is acted upon. The intensity and quality of the sound produced at the receiving station are therefore, with such an instrument, entirely independent of the intensity and quality of the original sound produced at the transmitting station. It is for this reason that an instrument of this class, such as, for example, the well-known Reis instrument, is incapable of transmitting either intensity or quality; and hence is incapable of transmitting articulate speech.

As will be seen from what I have already said, the Reis transmitter, or any other transmitter which operates by making and breaking the circuit, is capable of transmitting pitch, and pitch only.

There is also another reason which prevents a Reis transmitter, or other circuit-breaking instrument, from transmitting articulated speech; this is the effect of the interruptions of the current, in producing a loud and disagreeable noise in the receiver, which, of itself, would be sufficient to overpower and obliterate those fine shades of variation upon which differences in quality depend.

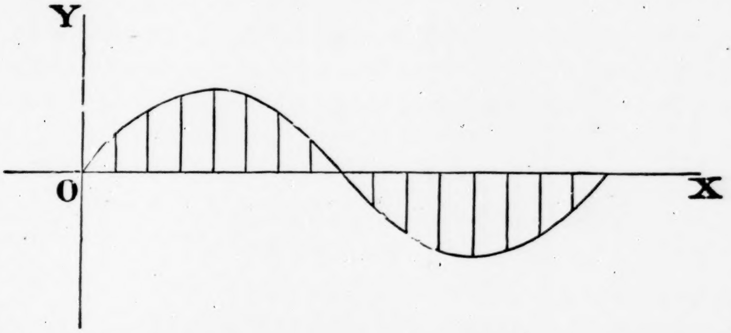
In fact this noise is so marked, that an ordinary battery transmitter can be used as a telephonic call by so operating it as to cause it to actually make and break the electrical circuit. Under these circumstances, the noise which proceeds from the receiving instrument, which, when the transmitter is used in a normal and proper manner, can be heard only by one close to the instrument, is capable of being heard throughout a large room.

Int. 7. You speak of the sound waves, and explain the mode in which they are produced. Do you understand that the actual existence of these sound waves has been demonstrated, or is accepted as a fact by scientific men?

Ans. The existence of such sound waves has been accepted as a fact by scientific men for several hundred years. Within a few years past, they have been visibly shown to exist by a method which demonstrates the existence of alternate condensations and rarefactions to the eye.

Int. 8. Has any method of representing such waves been adopted; and if so, what is it?

Ans. It is customary among physicists to represent the motions of the particles of a sound wave, and also the variations in condensation and rarefaction at different points in a sound wave by a graphical method. I can best illustrate this by reference to a diagram which I produce, to be incorporated in my answer.



The curve in the diagram is what is called a sinusoidal curve, such as corresponds to the sound waves produced by a simple sound, consisting of a single note without overtones. (Such a sound can be produced by a tuning-fork, mounted on a resonant case, and bowed in a manner suitable for this purpose.) O X is divided into a number of equal spaces to represent equal periods of time. The length of these spaces is purely arbitrary. The distances from O to the beginning of any one of these divisions in all its characters of pitch, intensity and quality, it is necessary that the movable portion of the receiving instrument should be constantly under the guidance of, and controlled by, the movable portion of the transmitting instrument; and in case this constant control is not exercised, and in precisely that degree in which it ceases to be exercised, the instrument becomes incapable of transmitting articulate speech.

No form of transmitter which operates by making and breaking an electrical circuit can possibly transmit articulate speech, or any other sound in its different characteristics of pitch, intensity and quality; for the reason that the constant control of which I have spoken is not exercised in such an instrument. With any circuit-breaking instrument the loudness and quality of the sound produced at the receiving station are dependent solely upon the physical construction and action of the receiving instrument itself, and of the battery or other source of electricity by which the transmitter is acted upon. The intensity and quality of the sound produced at the receiving station are therefore, with such an instrument, entirely independent of the intensity and quality of the original sound produced at the transmitting station. It is for this reason that an instrument of this class, such as, for example, the well-known Reis instrument, is incapable of transmitting either intensity or quality; and hence is incapable of transmitting articulate speech.

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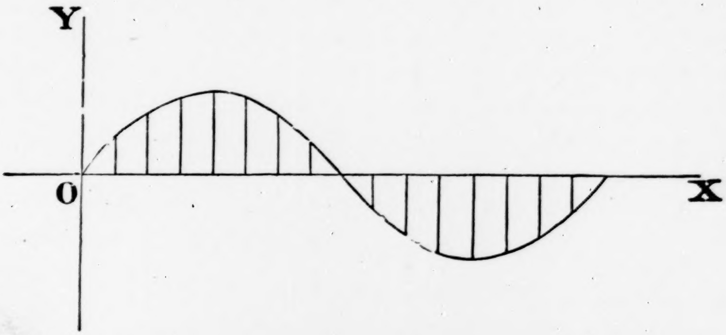

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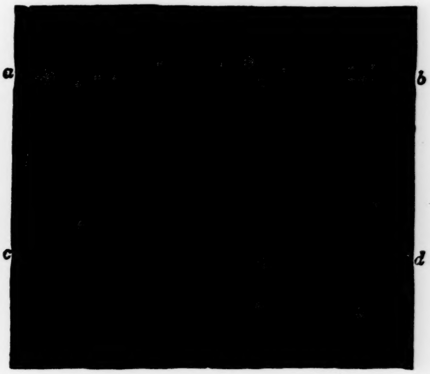
It is from this habit of graphical expression that a vibration is commonly spoken of among physicists as having "form"; form of vibration is a phrase used to signify the "character" of a vibration, as I have explained it.

It must be remembered that this curve does not represent the path of the moving particle; that always moves to and fro in a straight line. This curve is merely a convenient form of expressing to the eye the character and variation of the motion.

Int. 9. If you can produce from any scientific work a diagram representing the manner in which overtones are combined with a fundamental to give quality to sound different from that due to the fundamental alone, and representing the form given to the curve as the result of all the vibrations, will you do so, stating the source from which you derive it, and explaining, as far as you think necessary, the diagram?

Ans. The following diagram, taken from Mayer on "Sound," p. 153, represents the motion of a particle under the influence of sound waves: —

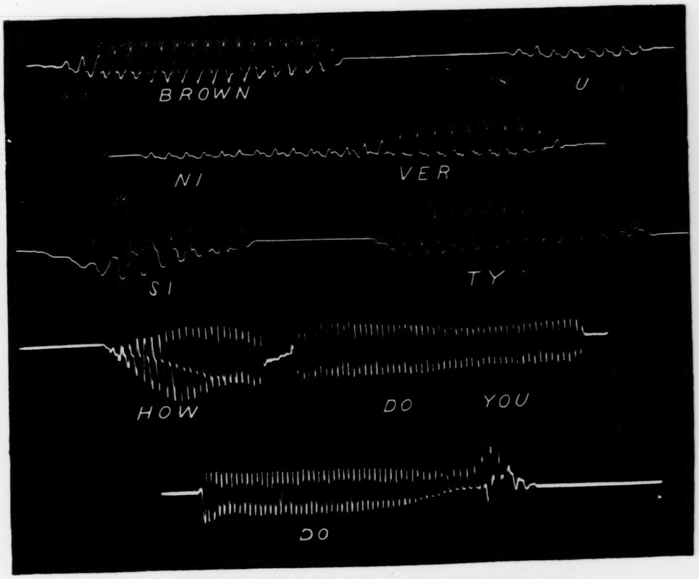


The curves *a b* represent six sound waves of six simple sounds. When these are sounded together as fundamental and overtones, and with relative intensities corresponding to the amplitude of the curves, as drawn, so as to produce a sound having the quality due to this combination, the vibrational "form," as it is called, of the sound perceived by the ear is represented by the curve at *c d*. The set of vibrations which constitutes one complete vibration is shown twice between *c* and *d*. The entire "form" or character of this curve can be determined and controlled, as already stated, by determining or controlling for each point the length of the abscissa and of the ordinate for that point, or in other words, determining or controlling the elements of time or frequency, amplitude or intensity, and direction; but it is obvious that it will require very many measurements of abscissas and ordinates to determine or control the "form" of each complete set of vibrations.

The curve representing one set of vibrations is about three inches long; and it is apparent, even to a casual observer, that by taking the ordinates as little as one eighth of an inch apart, we should miss the little twists which most strikingly represent to the eye the "quality" or the effect of the overtones in this vibrational form, and which are equally important to the "quality" of the sound as perceived by the ear; and as in the articulate speech of a woman there are twenty-four thousand of these *complete* sets in a minute, it will be obvious that in order to reproduce this vibration the control must be exercised not merely twenty-four thousand times a minute, but really without any interruption or cessation whatever.

Int. 10. If observations have been made upon the curves produced by spoken words, and you can produce a diagram representing the results of such observations, will you do so, giving the authority from which they are made?

Ans. The minute changes which took place during articulation are well shown in a series of curves made by Prof. E. W. Blake, Jr., of Brown University, and described in "Silliman's Journal" for July, 1878. These curves were produced by reflecting a ray of light from a mirror, so attached to the plate of a speaking telephone that the vibrations of this plate were communicated to the mirror. The reflected ray is caused to act photographically upon a sensitized plate of glass, the mirror at the same time being caused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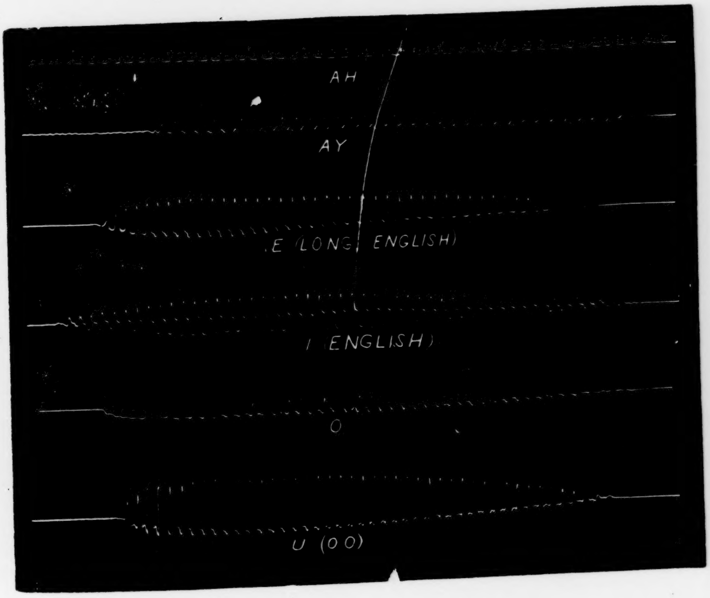
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AY
E (LONG ENGLISH)
I (ENGLISH)
O
U (OO)

to vibrate by the action of the voice upon the telephone plate. On rapidly moving the plate of glass in a direction at right angles to that in which the reflected ray was caused to vibrate by the vibrations of the mirror, a photographed representation of the complex vibrations of the mirror was produced. In Prof. Blake's figures the vibrations characteristic of different vowels, and the rapidly changing vibrations produced in the case of a spoken sentence, are very beautifully shown. According to the statement made by Prof. Blake in the article referred to, the vibrations are magnified in the accompanying cuts one hundred and twelve times. Notwithstanding the accuracy of Prof. Blake's drawings, the mere thickness of the lines in the wood-cut is sufficient to obliterate many of the more delicate variations in those vibrations which characterize articulate speech.

Int. 11. Referring again to the first Bell patent (No. 174,465) to which your attention has been called, will you state what the moving parts are which you have referred to as being put in motion by sound waves or by variations of current produced by sound waves?

Ans. In Fig. 7 the transmitter possesses a movable armature, *c*, one end of which is hinged, while the other is so attached to a membrane at *a* that when this membrane is set in vibration by the utterance of a sound into the cone A, the armature shall be caused to take up the vibrations of the membrane. By the vibration of this armature, as it approaches nearer to or recedes from the pole of the electro-magnet *b*, in accordance with the well-known laws of magneto-electric induction, electrical undulations or waves are produced in and transmitted by the line wire *e*. The receiving instrument which is in electrical connection with the line wire possesses an electro-magnet, *f*, whose magnetic strength varies in accordance with the electrical variations produced in the line wire, in the manner described. In front of this electro-magnet of the receiver and opposite its pole is a vibratory armature of inductive metal hinged at *k* and connected at *i* with a membrane stretched over the larger end of the cone L, so that variations in the magnetic strength of the electro-magnet *f*, produced by electrical variations in the line wire *e*, produce vibrations in the armature *h*, and consequently in the attached membrane, so that this attached membrane vibrates in correspondence with the motions of the membrane of the transmitting instrument, and therefore in correspondence with the vibrations of a voice by which the membrane of the transmitter is actuated. I should have said that the vibrating armatures of both the transmitting and receiving instruments are of iron or other inductive metal; and I would also call attention to the fact that the hinged end of each of these vibratory armatures is in magnetic connection with that pole of the electro-magnet which is farthest from the vibrating part of the armature itself; this mode of connection serving to increase to a certain degree the magnetic strength of the apparatus.

Int. 12. Will you explain a little more in detail the function of the battery represented in Fig. 7 of the Bell patent of which you have been speaking, and the manner in which the undulations in the current are produced in the apparatus represented in that figure; and in what way the undulatory current acts in the receiving instrument to produce the proper results?

Ans. The magnets *b* and *f* in Fig. 7 are electro-magnets having soft iron cores, which cores are magnetic only when a current of electricity is passing through the coils surrounding them. The object of the battery shown in Fig. 7 is simply to produce this current, which shall cause the cores to be kept magnetized. The armature *c* of the transmitter, which is of iron or other inductive metal, will, as it moves to and fro, alternately increase and diminish the magnetic strength of the magnet *b*. These variations of magnetic strength will correspond to the various changes in motion of the vibrating armature. In accordance with the well-known laws of magneto-induction, as discovered by Faraday, every change in the magnetic strength of the core of the electric magnet *b* will produce corresponding changes in the current of electricity which passes through the line wire *e*. These variations in the strength of the current will cause corresponding variations in the magnetic strength of the electro-magnet *f*, and these variations in the strength of the magnet will act immediately upon the vibratory armature at *h*. An increase of strength in the magnet *f* will cause the armature to approach to the magnet, while diminution of magnetic strength will allow the armature, under the influence of the tension of the membrane to which it is attached, to recede farther from the pole *f*. Hence, under the influence of the varying magnetic strength of *f*, the vibratory armature at *h* will execute vibrations corresponding to these changes in magnetic strength, and therefore corresponding to the changes in the electric current in the line wire *e*, to the changes in the magnetic strength of the magnet *b*, and therefore corresponding to the variations in the motion of the vibratory armature at *c*, when moved by the vibrations of the membrane with which it is in contact. The membrane of the receiving instrument at *i* will therefore vibrate in correspondence with the membrane *a* of the transmitting instrument.

Int. 13. Do you find any method suggested in the patent as an alternative one to that you have described for producing the variations or undulations in the current between the transmitter and receiver; if so, will you quote from the specification the language which refers to such other mode?

Ans. It was well known to electricians, long before the date of Mr. Bell's first patent, that the strength of electrical current can be varied, either by increasing its electro-motive force, or by diminishing the resistance of the circuit, in accordance with the well-known law of Ohm, $\text{Current} = \frac{\text{Electromotive force}}{\text{Resistance.}}$

In the apparatus which I have described, Mr. Bell explains a method of producing these electrical undulations by varying the electro-motive force of the current. He also clearly recognizes the possibility of producing such undulations by varying the resistance of the circuit. In his specification, No. 174,465, I find the following: —

> "Electrical undulations may also be caused by alternately increasing and diminishing the resistance of the circuit. . . . The internal resistance of a battery is diminished by bringing the voltaic elements nearer together, and increased by placing them farther apart. The reciprocal vibration of the elements of a battery, therefore, occasions an undulatory action in the voltaic current. The external resistance may also be varied. For instance, let mercury or some other liquid form part of a voltaic circuit; then the more deeply the conducting wire is immersed in the mercury or other liquid, the less resistance does the liquid offer to the passage of the current. Hence the vibration of the conducting wire in mercury or other liquid included in the circuit, occasions undulations in the current. The vertical vibrations of the elements of a battery in the liquid in which they are

immersed, produce an undulatory action in the current, by alternately increasing and diminishing the power of the battery."

Int. 14. If electricians have been in the habit of stating the law to which you have referred in algebraic terms, will you give the form of expression which has been used, explaining the symbols; and state how long that law has been known, and whether or not it is one which has been found of use in the practical application of electricity?

Ans. The law of Ohm is usually expressed by a formula $C = \frac{E}{R}$, in which C is the strength of the current, E, the electro-motive force, that is the force producing the current; and R, the total resistance of the circuit. Ohm's law was, if I recollect rightly, first stated by him about the year 1830. For the last thirty years its importance has been fully recognized by physicists, and it has been applied by constructors of electrical apparatus in determining the dimensions and arrangement of the different parts of such apparatus.

Int. 15. State whether or not, in your judgment, the substitution of one of these ways of varying the current for the other, changes substantially the character of the described apparatus as an apparatus for transmitting sounds; or changes substantially the method by which sounds are transmitted or reproduced.

[*Objected to by counsel for defendants as incompetent, on the ground that the question involves, in part, a question of law and a legal construction of the patent of Bell.*]

Ans. Speaking as a scientific man, I should say that it does not.

Int. 16. If you have examined the two instruments which have been produced in evidence, marked respectively Exhibits "Klemm Battery Transmitter" and "Tisdel Magneto Telephone," and find them adapted to be used for any purpose when connected in electrical circuit with a battery, state what you find their purpose to be.

Ans. I find that the instruments referred to are, from their construction and method of operation, adapted, when suitably connected with a battery, to transmit articulate speech.

Int. 17. State whether so not, in your judgment, when so connected and used for that purpose, they constitute an apparatus substantially like that described in the Bell patent of which you have been speaking, and referred to in the fifth claim, and which will operate in transmitting sounds by substantially the same method; and whether or not, in your judgment, they embody, when so used, the invention described in said patent and referred to in said claim?

[*Same objection as to Int.* 15.]

Ans. The apparatus to which I have referred in my last answer, Exhibits "Klemm Battery Transmitter" and "Tisdel Magneto Telephone," when connected and so operated as to transmit articulate speech, use the method invented by Mr. Bell, and described in his specification No. 174,465, for transmitting vocal or other sounds telegraphically, by causing electrical undulations similar in form to the vibrations of the air accompanying such sound. The instruments in question most certainly embody the invention which Mr. Bell describes in his specification referred to; and when used in the transmission of articulate speech, constitute an apparatus which is substantially that described by Prof. Bell.

Int. 18. Will you compare these instruments, when so connected and used, with Mr. Bell's apparatus to which you have referred, pointing out the functions and mode of operation of the several parts; and if you find that these instruments differ specifically from the Bell apparatus, explain the nature of the differences, and give your judgment as to their affecting the substantial likeness of this apparatus to the Bell apparatus, and its method of operation.

Ans. In Mr. Bell's patent No. 174,465 I find a transmitting instrument, a receiving instrument, a line wire connecting these and a battery or other source of electricity. In the apparatus described the transmitter possesses a movable part which is capable of being set in vibration by the agency of the voice. This movable part is so arranged that it shall cause electrical variations in the current traversing the line wire. The receiver is so arranged that the variations of current referred to shall communicate motion to a movable part, which shall in its turn communicate motion to the air about it. As I have already shown, at some length, the vibrations of this movable portion, when actuated by the sound waves produced by the voice, correspond to these in form; and by their action upon the receiving instrument cause it to vibrate in a similar manner, and hence

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produce corresponding vibrations in the air about the receiver. The function of the transmitter, it is evident, is simply to produce in the line wire electrical undulations similar in form to the vibrations of the air particles through whose agency they are produced. The function of the receiver is simply to translate, so to speak, the electrical undulations produced by the transmitting instrument and conveyed to the receiving instrument by the line wire, into vibrations of the air at the receiving instrument. Mr. Bell indicates that these electrical undulations may be produced either by varying the electromotive force of the current, or by varying the resistance of the circuit.

In the exhibits specified I find a transmitter and a receiver, which, when placed in electrical connection with each other by means of a line wire, and provided with a battery as a source of electricity, are adapted to transmit, and will transmit articulate speech from one station to another.

In the Klemm battery transmitter, I find an instrument which, from its construction, is adapted to produce, and when properly operated by the voice, will produce electrical undulations in the current traversing the circuit, similar in form to the air waves by which these electrical variations are produced.

In the Tisdel receiver, I find an instrument which is adapted to produce vibrations in the air, similar in form to vibrations originally produced in the air, at the transmitting station, by the voice; as I have already explained. The defendants' apparatus, like the Bell apparatus, contains a transmitter, which from its construction is adapted to produce electrical undulations as described, and a receiver which is adapted to retranslate these electrical undulations into vibrations of the air.

The Klemm battery transmitter adopts one of the methods mentioned by Mr. Bell, as suitable for the production of electrical undulations similar in form to the air waves produced by the voice; namely, by varying the resistance of the circuit. The precise method adopted in the Klemm transmitter for varying the resistance of the circuit is different from the particular method referred to by Mr. Bell, inasmuch as it utilizes the property of variation in resistance with variation in pressure possessed by various substances.

In my opinion, however, the adoption of one rather than another particular method of varying the resistance of the circuit does not materially affect the substantial likeness of the apparatus of Mr. Bell and the defendants, or its method of operation.

Int. 19. Will you state whether the fact to which you refer, that the resistance of substances may be varied by pressure, was one known before the date of Mr. Bell's patent, and recognized in the construction of electrical apparatus; and if you can refer to any electrical works of authority, where this fact is referred to, will you do so, and quote the references to the fact?

Ans. It was known long before the date of Mr. Bell's patent, that the resistance of a circuit is varied, without being broken, by variations in the intimacy of contact or amount of pressure between two electrodes in contact, from one to the other of which a current is passing. This fact was noted and recorded by Du Moncel in his book, "Applications de l'Electricité," Vol. II., page 246, edition of 1856, published at Paris in that year. In "Comptes Rendus," for July, 1874, a communication from the same writer described some experiments as to the resistance offered to the current in passing from one electrode to another, in the case where one was a good conductor and the other a poor conductor, and showed that a moderate increase of pressure at the contacts would materially increase the conductivity and thereby the current; and he gave his explanation for this phenomenon.

In Du Moncel, "Applications de l'Electricité," ed. 1856, Vol. I., p. 246, I find the following: —

> "Une chose assez curieuse, et qui paraît être au premier abord en contradiction avec la théorie que l'on s'est faite de l'électricité, c'est que la plus ou moins grande pression exercée entre les pièces de contact des interrupteurs influe considérablement sur l'intensité du courant qui les traverse. Cela tient souvent à ce que les métaux de l'interrupteur ne sont pas toujours dans un état parfait de décapage au point de contact, mais peut-être aussi à une cause physique encore mal appréciée. Ce qui est certain, c'est que, dans les interrupteurs où la pièce mobile de contact est sollicitée par une force extrêmement minime, le courant éprouve souvent des affaiblissements assez notables pour faire manquer la réaction électrique qu'on attend d'eux."

Which I translate as follows: —

"A somewhat curious fact, which at first sight appears to be in

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contradiction to the views ordinarily received as to the action of electricity, is that the greater or less pressure exercised between the contact pieces of interrupters has an important influence upon the strength of the current which traverses them. This often happens because the metal of the interrupter is not perfectly free from rust at the point of contact, but perhaps also because of a physical cause as yet but little appreciated. This is certain, that with interrupters in which a movable contact piece is acted upon by a very slight pressure, the current often sustained such an enfeeblement as to cause a failure in the electrical action which was expected."

The same writer describes in "Comptes Rendus" for July 6, 1874, a series of experiments in which he measured the current in a circuit, part of which consisted of a platinum electrode and a piece of wood, more or less damp, kept in constant contact, but with varying pressure, and says, page 41, in an article entitled "Récherches sur les transmissions électriques a travers les corps ligneux," as follows: —

"Les expériences que j'avais à faire pour avoir une constatation exacte des effets produits, étaient assez délicates, car une foule de causes étrangères peuvent intervenir, et changer les résultats fournis. Ainsi le dégré de serrage des plaques metalliques de communication avec le bois, son isolement plus ou moins parfait du sol et des murs de l'appartement, où l'on expérimente, la grandeur des surfaces mises en communication avec le circuit métallique, la masse du bois, l'état plus ou moins humide de l'air du cabinet expériences, le contact fortuit des doigts sur les fils de communication avec le galvanometre, et l'état d'isolement de ces fils sont autant de causes qui peuvent modifier les résultats que l'on obtient.

. . . .

6. "Que le dégré de la pression de la plaque de platine contre le bois a telement influé sur l'intensité du courant ainsi transmis, qu' étant de 12 dégrés avec un serrage maximum elle est devenue à zéro quand la plaque était abandonné a son propre poids, et a 5 dégrés seulement avec un faible serrage."

This I translate as follows: —

"The experiments that I have had to make in order to have an exact proof of the effects produced were very delicate, because a number of foreign elements might enter and change the results. Thus *the amount of pressure upon the metallic plates in communication with the wood* is more or less perfect insulation from the earth or the walls of the room, the size of the surfaces put in communication with the metallic circuit, the mass of the wood, the greater or less humidity of the air, the accidental contact of the fingers with the wires leading to the galvanometer, and the condition of the insulation of these wires were causes which might modify the results that would be obtained.

. . . .

"6. That the amount of the pressure of the platinum plate against the wood has so much influence on the strength of the current thus transmitted, that from twelve degrees, with a maximum pressure, it became reduced to zero when the plate was pressed only by its own weight, and to five degrees only with a slight pressure."

In Du Moncel's "Traité de Telegraphie Electrique," Paris, 1864, Part IV., page 559, in speaking of apparatus designed to establish electrical contact, the author says,

"L'expérience montre que plus la pression des contacts est grande, plus est énergique l'intensité du courant qui les traverse," that is, in English, "Experiment shows that the greater the pressure of the contact pieces, the stronger is the current passing through them."

This fact was also constantly acted upon in the practical use of electrical apparatus; care was always taken that contacts should be firm and with considerable pressure, for otherwise the full and desired strength of current was not obtained.

Int. 20. In the Exhibit Klemm Magneto Telephone the magnet, as I understood it, is a permanent magnet and differs somewhat in form from the electro-magnet shown in the Bell receiver. State whether or not these differences affect the substantial likeness of the two instruments in respect to their function and mode of operation, and the work they do in the transmission of sounds.

Ans. They do not, since the function of the battery represented in Fig. 7, of Mr. Bell's specification, is merely to keep the cores of the electro-magnets magnetic. When permanent magnets are employed the permanent magnetism of such magnets is substituted for the magnetization produced by the battery current.

Int. 21. Will you refer to the second Bell patent No. 186,787, which has been produced in evidence, and describe briefly so much of the apparatus therein described as is referred to in the fifth, sixth and eighth claims, pointing out the functions or results which are attributed to the parts of the apparatus referred to in those claims?

Ans. Claim 5 relates to the special form of magnet suited for use in an electric telephone; the coil being placed about the end or ends of the magnet nearest the plate. The object of thus placing the coil is to render the magnet quicker in its working, that is, more ready to respond with the requisite rapidity to the variations in the strength of the current passing through the coil. A magnet with the coil thus placed responds more quickly by changes in its strength to slight changes in the strength of the current, and hence it is better adapted for use in the speaking telephone than a magnet in which the coil surrounds the whole length of the magnet, and which consequently acts more slowly.

In claim 6 is mentioned the sounding box, which is combined with the telephone. This sounding box has an important influence in screening the plate of the instrument from the effect of extraneous sounds. The thin air space in front of the plate also exercises an important influence.

In claim 8 I find mentioned the combination of a permanent magnet, with coils upon its end or ends, as described, with a plate of iron or other material, capable of inductive action. The use of the plate of iron, in connection with the magnet, as described in a system of electric telephony, furnishes a most excellent method of causing the electrical and magnetic variations of the apparatus to produce corresponding vibrations in the air.

Int. 22. Referring to the defendants' instruments which have been introduced in evidence, will you compare them with the apparatus described in the patent last referred to, and state how far, if at all, you find them to embrace the features or combinations described in the patent and referred to in the claims above specified?

Ans. In the defendants' magneto-telephone, I find a magnet with a coil upon the end nearest the plate, as described in claim 5. This magnet is placed within a sounding box, as described in claim 6. I find, also, a permanent magnet, as described in claim 8. The mouthpieces of both instruments are so arranged as to leave a thin space filled with air in front of the vibrating plate.

Int. 23. Do you find in the defendants' Klemm battery transmitter that the diaphragm is protected from the action of extraneous sound by a box substantially like that described in the Bell patent?

Ans. I do find that it is thus protected.

Int. 24. I find, in the second Bell patent, a statement that the same instrument is used both as a transmitter and a receiver; and I understand that the electrical portion of the apparatus described in Bell's first patent is the same both in the transmitter and receiver. Will you state whether the exhibit marked "Klemm Magneto Telephone" is, when properly connected in line with another instrument of the same kind, capable of being used as a transmitter as well as a receiver?

[*Objected to as immaterial and as not relating to any issue in this case.*]

Ans. It is.

Int. 25. You referred, I believe, to the fact that in the Klemm battery transmitter the reduced space is present, shown in front of the plate in Bell's second patent. State whether or not you also find in that transmitter the reduced orifice which admits the sound waves to the plate directly at its centre.

Ans. I do.

Int. 26. Please to examine the instrument complainants' Exhibit Tisdel Magneto Telephone, and look particularly at the armature tongue there found; and state how it is connected with the magnet; and what kind of effect that magnetic connection between the armature plate and the magnet has upon the condition of the armature plate, and upon the operation of the apparatus.

Ans. In the instrument mentioned the armature tongue is attached to that pole of the magnet opposite the pole which carries the soft iron pole piece and coil. The armature tongue is attached by means of a screw; and on account of the flexibility of the tongue the portions of this nearer its extremity are capable of vibrating when acted upon either by the diaphragm or the magnet.

The effect of the attachment of the armature tongue to the pole of the magnet is to so polarize it that that portion of the tongue which is opposite the pole piece and coil shall be of an opposite polarity to that of the pole piece itself. The effect of this polarization, provided it has any practical effect, would be to cause slightly stronger currents in the coil than would otherwise be produced.

Int. 27. Please to examine the two Bell patents, which you have already referred to, and state whether you do or do not find in either of them a speaking telephone apparatus, in which the armature tongue is polarized by magnetic connection with the uncovered leg

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of the operating magnet, the other end of which carries the operating coil; and, if you do, point out where you find that feature.

Ans. In Mr. Bell's first patent, No. 174,465, Fig. 7 represents an instrument of this kind. The armatures marked *c* and *h* respectively, in that figure, are fastened loosely at one extremity of the magnets *d* and *k*, so that they can vibrate readily, and so that the vibrating tongues shall be opposite the other pole of the corresponding magnet. These armatures are evidently polarized by induction; and, in consequence, tend to produce greater variations of the current in the coils than would be produced if they were not thus polarized.

Int. 28. In your twenty-sixth answer you indicate that part of the Tisdel instrument which is enclosed in the coil, as a soft iron pole piece mounted on one pole of the permanent steel magnet. Please state what effect that arrangement has on the condition of the said soft iron core, and whether or not you find such an arrangement for the same purpose in either of said Bell patents; and if so, point out the figure which shows it.

Ans. The soft iron pole piece, from its position in connection with the permanent magnet, is constantly polarized, without the necessity of connecting the coil with a battery. A magnet made in this way is much quicker in its action; and, owing to this increased sensitiveness, much better fitted for use in a speaking telephone than if the coil covered a greater portion of the magnet.

This construction of a pole piece surrounded by a coil in contact with and continually polarized by a permanent magnet is shown in Fig. 5 of Mr. Bell's second patent No. 186,787.

Int. 29. I observe that the said Tisdel instrument contains an armature tongue which operates upon or is operated by the electromagnet; and also a diaphragm of insignificant inductive capacity, which acts upon the air or is acted upon by sound waves in the air, according as the instrument is used as a receiver or transmitter.

Will you please state what connection the vibrations of the one have upon the vibrations of the other, if any, and how that connection is secured, if it exists?

[*Objected to as leading; assuming a condition and state of facts by counsel; and not interrogative; and assuming the operation of the device without any demonstration.*]

Ans. The armature tongue is so placed in relation to the diaphragm, that a small piece of rubber which is attached to the tongue (being inserted in a hole drilled in the tongue) shall constantly be in contact with the diaphragm. Hence the armature tongue is, in consequence of this attachment, forced to follow the motions of the plate in its vibration, when the instrument is used as a transmitter; and the plate is forced to follow the vibrations of the armature tongue when the instrument is used as a receiver.

In the instrument exhibited, the armature seems to be mounted so that the rubber shall always be in contact with the plate throughout its whole vibration.

[*Adjourned.*]

FEB. 17.

Cross Examination by LEWIS ABRAHAM, Esq., *of Counsel for Defendants as aforesaid.*

Cross-Int. 30. In answer to Int. 3, in your examination in chief, you say you are practically familiar with the construction and use of the various forms of instruments made in accordance with the Bell patents. Please describe the various forms to which you refer.

Ans. I refer to instruments in general in which the "undulatory current" produced through the action of the voice upon the transmitter is used to reproduce this motion in the receiver. As special forms of the instrument constructed and operated in accordance with the claims of Prof. Bell, I would mention, among others, those represented in Fig. 7 of Mr. Bell's first patent, and those represented in the various figures of Mr. Bell's second patent; also the various forms of microphone transmitter as used by Berliner, Edison, Hughes, Blake and others.

Cross-Int. 31. Are the speaking telephones now in general use built in exact accordance with the specifications and claims of patent No. 174,465, without any additions or improvements either of Bell or others?

Ans. There have been various improvements upon the particular form of apparatus shown in Fig. 7 of that patent; and certain modifications in the precise manner of varying the resistance of the circuit, in cases when this one of the two methods mentioned by Mr.

Bell for producing the undulatory current is used; but all of these variations are intended to accomplish more perfectly the result mentioned in claim 5 of said patent, and operate in the manner there set forth.

[*Answer objected to as not responsive, and the question is repeated.*]

Cross-Int. 32. [*Cross-Int.* 31 *reread.*]

Ans. They are not.

Cross-Int. 33. You state also in your answer to Int. 3, that during the last two years, in the capacity of expert for the American Bell Telephone Company, you have conducted a series of experiments relating to the different branches of the telephone. Please state when your employment commenced, and what duties you have performed as an employé of that company.

Ans. I was first employed by the company in the spring of 1879, in connection with one of the patent cases then in progress; since that time I have been employed by them quite frequently in connection with various cases. I have also frequently been consulted by them with regard to improvements and modifications in the operation of the telephone.

Cross-Int. 34. Are you generally retained as expert for the American Bell Telephone Company?

Ans. They have frequently called upon me when issues have arisen involving the discussion of scientific facts. As I know nothing about the legal operations of the company beyond those specific cases in which I have been asked to testify, I can give no more definite reply than what I have already indicated.

Cross-Int. 35. In whose behalf and at whose request have you testified as a witness in the cases of the courts of the United States, or in cases in the United States Patent Office, upon the principles of inventions embraced in patents or apparatus relating to what is known as the telephonic art?

Ans. At the request of the attorneys of the American Bell Telephone Company, and in behalf of that company.

Cross-Int. 36. Please name, as nearly as you can recollect, the several cases in which you have testified on behalf of that company, either in the courts or before the Patent Office.

Ans. I have testified in connection with the Dowd case, in 1879; and with cases involving the alleged inventions of Messrs. Chinnock, Eaton, and others; I have also given affidavits in connection with the People's Telephone Company, Messrs. Pearce and Jones, and a number of others. The only interference controversies I have testified in relation to, in the Patent Office, relate to certain improvements embodied in the instrument known as the Blake transmitter.

Cross-Int. 37. Referring to claim 5, in patent No. 174,465, do you understand that the electric undulations therein claimed are similar in form, and pass over the line wire similar in form from end to end of said wire, to the form of the sound waves that set the transmitter in motion?

Ans. I do.

Cross-Int. 38. Please explain what you denominate as "continuous voltaic current." Does such a current flow as a continuously uninterrupted flash along the wire without any reference to what distance there is between the *termini*, without any aberration, undulation, pulsation or sinuosity?

Ans. By a "continuous voltaic current," I understand such a current as flows through a conducting wire connecting the two poles of an ordinary galvanic battery. On making or breaking, or in any way electrically altering the battery, conducting wire, or any part of the circuit, electrical changes are of course produced whose nature and the rapidity of whose propagation depend, among other things, on the electrical condition, size, length, etc., of the conducting wire. But when a steady condition of flow has been reached, this flow will continue unchanged so long as the conditions of the circuit remain unchanged. Such a current would be a continuous current.

Cross-Int. 39. In your last answer you speak relatively of the length of the circuit wire. Please approximate the maximum length over which you say a continuous current can practically pass, without any aberration or change.

Ans. Under the conditions supposed, of freedom from disturbing influences, acting to produce an electric change in the circuit, I do not see any limit to the length of the wire.

Cross-Int. 40. In practice, are not all circuit wires affected by atmospheric or other influences?

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Ans. I suppose that there is always a certain influence from disturbing causes; sometimes it is too slight to be detected; sometimes it is so considerable as to produce great annoyance.

Cross-Int. 41. You have testified very learnedly and at great length, on the law of physics relating to the transmission of ordinary sounds. If I correctly understand you, each sound wave acts on an elastic particle of air, and moves it or expands it forward, which, in turn, acts upon its next adjacent particle, and so on continuously, similarly affecting successive adjacent particles, that in consequence of their *inertia* or normal state of rest, they rebound in a direction contrary to that in which they were first impelled by the force of sound; and that, therefore, there is a constant and successive to-and-fro motion imparted to these chains of connecting air particles.

Please explain, if I am correct; and if not, the particular method in which chains of air particles transmit sound from point to point, and thence to a finality.

Ans. Your supposition is correct, so far as the propagation of the original forward motion of each particle, that is, so far as the production of a condensed wave is concerned. The backward motion of the particles is brought about in the following manner: When the sounding body in the course of its vibration moves backward, its motion tends to produce a partial vacuum, the neighboring particles rush in to fill up this space, producing in their turn a diminished pressure a little farther on, and in this way the backward motion or rarefied wave is propagated.

Cross-Int. 42. Is the transmission between these particles a continuity of repeated physical blows, or an expansion and contraction of the several particles of air or their interstices?

Ans. The modern theory of gases which is universally accepted among scientific men supposes all gaseous pressure to be caused by the perpetual "bombardment" of the walls of the containing vessel by the gaseous molecules. By "bombardment," I mean a series of blows very rapid and forcible, produced at almost infinitesimal intervals by the molecules of the gas as they strike against each other, and the vessel containing them.

Cross-Int. 43. Is the sound wave you allude to, and place in inverted commas, in your answer to Int. 6, a sinuous, curved, bent, or simply a plane and rectilinear motion.

Ans. The particles composing the sound wave move to and fro in straight lines in the direction in which the sound progresses. A graphical representation of this sound wave is a sinuous line constructed as I have explained in my answer to Int. 8.

Cross-Int. 44. In further answer to said interrogatory, you say that all the particles of air through which the sound progresses partake of the various characteristics which you have previously named. What are these characteristics? Does each particle in succession partake of all these characteristics?

Ans. The three characteristics of the motion of the air particle mentioned are stated in my answer to Int. 6, in the sentence beginning, "It is evident in the first place" [page 22 of this printed record]. The variations in the sound produced are pitch, intensity, and quality or *timbre.* Each particle in succession partakes in its motion of the three characteristics mentioned.

Cross-Int. 45. Further on you speak of difference in quality being due to difference in character of the motions. Describe the different character of motions to which you refer. Please explain fully the course, direction and contour of these motions; whether spherical, curvilinear, angular or otherwise.

Ans. The motions of the air particles are always to and fro in the same straight line. Difference in quality depends upon the manner in which the rate, frequency and direction of this to-and-fro motion change. This fact will be more clearly understood by reference to the figure given in my answer to Int. 9. Any one of the series of upper curves represents graphically, as previously described, a simple sound of a certain quality. The lower curve represents graphically the complex sound of a different quality. The curves in question are simply graphical or geometrical statements of the algebraic equation which represents the more or less complex motion of the vibrating air particle As I have already said, the motion of the particle itself is always a rectilinear to-and-fro motion.

Cross-Int. 46. In what manner have you demonstrated that the receiving instrument in a telephone moves in exact unison with the

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movements of the several particles of air that have been set in motion at the starting point?

Ans. The only practical demonstration that I know of this perfect correspondence between the motions of the two, lies in the fact that the receiver is practically able to reproduce the various characteristics of the voice itself.

Cross-Int. 47. Are not the diaphragms of the transmitting and receiving instruments, as described in the Bell patents, at right angles, or nearly so, to the line wire?

Ans. In Fig. 7 of the first patent, the diaphragms are substantially at right angles to the line wire. In the diagrams on sheet 2 of the second patent, the diaphragms are parallel to the general direction of the line wire.

Cross-Int. 48. Do I understand you to say that no form of transmitter which operates by making and breaking an electric current, can possibly transmit articulate speech; and that any transmitter which operates by making and breaking an electric circuit is capable of transmitting pitch, and pitch only?

Ans. That is my statement.

Cross-Int. 49. You have testified to the receiving instruments, as described in the Bell patents, vibrating or moving in correspondence with the sound motions propelled or carried over a line of wire; and you have particularly referred to a membrane stretched over the larger end of the cone L. Please state the thickness of this membrane, and at what degree of thickness would it cease to give responsive vibrations.

Ans. I have used membranes as thin as goldbeater's skin; and in some auxiliary experiments I have used a thin soap film, not more than from $\frac{1}{300000}$ to $\frac{1}{500000}$ of an inch thick. Of course this last was not directly in a telephone. The thickest membrane I have ever used was heavy sheepskin. I do not know at what limit of thickness the membrane would cease to respond to sounds of ordinary intensity.

Cross-Int. 50. At what degree of thickness would the membrane, or what is known as the diaphragm, in a transmitting telephone, fail to convey forward on a line wire sound waves or sound impulses?

Ans. Prof. Bell has used heavy iron boiler plate as a diaphragm, and found it sufficiently responsive to transmit the voice. I know of no experiments in which diaphragms thicker than this have been used.

Cross-Int. 51. Do you know of any speaking telephones in common use, built in exact accordance with the specification and claims of patent No. 186,787, without any additions or improvements either by Prof. Bell or others?

Ans. The box telephone, which I think is still occasionally used, is built in accordance with that patent. The only alteration is that the speaking tube, marked E in the figures, is greatly reduced in length. I mean to indicate by this answer, simply that I do not know that the box telephone is entirely disused; although various improvements have caused the original form to be superseded.

Cross-Int. 52. Do not the telephones placed upon the market by the American Bell Telephone Company, and the Metropolitan Telephone and Telegraph Company, consist of and combine several other improvements and inventions besides those of Prof. Bell?

Ans. They do.

Direct Examination resumed.

Int. 53. Please to look at the instrument now shown you, and tell me whether it is or is not the instrument commonly known as the "Bell hand magneto-telephone"; whether it is or is not the form of magneto-telephone commonly put out by the American Bell Telephone Company, except that this particular instrument has been cut open to show its interior.

Ans. It is.

Int. 54. Will you state about how long, so far as your knowledge extends, hand telephones of this particular form, style and construction have been put out for general commercial use by Mr. Bell and his licensees? I mean to include in this question instruments with wooden handles as well as hard rubber handles, if you have ever known of any such distinction in material.

Ans. My impression is that I first knew of their use either late in 1877 or early in 1878.

Int. 55. Please state whether any patented invention relating to telephones or improvements in telephone is embodied in

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that instrument, other than those set forth in the two Bell patents (No. 174,465 and No. 186,787), the dates of which are stamped on the face of it; and if you know of any other such patents, please name them.

Ans. I do not find in the instrument exhibited any patented improvements beyond those mentioned.

[*The instrument referred to is put in evidence and marked " Complainants' Exhibit Bell Hand Magneto-Telephone."*]

CHAS. R. CROSS.

Attest: CHAS. H. SWAN, *Examiner.*

Counsel for defendants calls upon counsel for complainants for copies of the agreements dated March 20, 1879, and May 8, 1880, referred to in the assignment of the Bell Telephone Company, dated June 2, 1880, and now in evidence as an exhibit; and requests that the same be filed in evidence.

Complainants put in evidence Office copy of patent No. 235,635, dated Dec. 21, 1880, issued to Frank A. Klemm, assignor, by mesne assignments, to the People's Telephone Company, of New York; application filed Nov. 18, 1879.

Also Office copy of patent No. 227,861, dated May 18, 1880, issued to Abner G. Tisdel, assignor to Frank A. Klemm, Ernest Marx, Simon Wolf and Moritz Loth; application filed May 18, 1880.

Also certified copy Patent Office Digest of assignments, agreements, etc., up to Dec. 18, 1880, under or relating to Letters Patent granted to, or inventions of, Daniel Drawbaugh, Frank A. Klemm and Abner G. Tisdel, relating to telephones.

Also certified copies either already filed or herewith filed in this cause of the following:

Agreement Klemm *et al.*, March 6, 1880.

Agreement Klemm *et al.*, March 8, 1880.

Deed Klemm *et al.*, to The People's Telephone Company, dated Sept. 4, 1880.

Deed Mary S. Marx *et al.*, to People's Telephone Company, dated Oct. 11, 1880.

Deed Drawbaugh to Klemm *et al.*, dated July 21, 1880.

Articles of association of The People's Telephone Company, dated Aug. 30, 1880, filed in the office of the clerk of the city and county of New York.

Counsel for defendants gives notice that he will hereafter call upon counsel for complainants for certain documents and agreements referred to in said defendants' answer in this cause, especially those referred to in paragraph 8 in said answer.

The complainants offer to call Edward L. Bradley.

Whereupon it is admitted and agreed by the respondents that said Bradley would testify as he has already testified in the annexed affidavit heretofore filed in this cause; it is also admitted by the complainants that the interviews with Klemm, Marx, and others were had at the express request of the complainants, in whose employ he was at the time, and thereupon cross-examination is waived, and it is agreed that said affidavit, with the foregoing admissions by the complainants, shall stand as the testimony of the said Bradley, subject to all legal objections to its relevancy and effect.

Whereupon the complainants rest their case.

LEWIS ABRAHAM,
for Respondents.
J. J. STORROW,
for Complainants.

AFFIDAVIT OF EDWARD L. BRADLEY.

CITY AND COUNTY OF NEW YORK, ss.

I, Edward L. Bradley, on oath depose and say: —

My name is Edward L. Bradley, age forty-two, residence Jersey City, New Jersey. I am familiar with electric speaking telephones. I produce herewith as part of this affidavit, a magneto telephone, which I have marked "Complainants' Exhibit Tisdel Magneto Telephone, E. L. Bradley." I also produce herewith, as part of this affidavit, a battery transmitting telephone, which I have marked "Complainants' Exhibit Klemm Battery Telephone, E. L. Brad-

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ley." On or about June 11, 1880, I purchased of Frank A. Klemm, personally, at his residence, No. 234 West 4th Street, New York, a pair of magneto telephones, of which said Exhibit Tisdel Telephone is one. On that occasion Mr. Klemm told me that he and those associated with him intended to make, and put out for use by the public generally, electric speaking telephones, and to establish by themselves and those whom they would supply with telephones, telephonic exchanges; that he was making said telephones at his said premises; that he was endeavoring to perfect a battery-transmitting telephone, to be also sold and put out in the same way. I annex hereto a copy of the bill for said magneto telephones, and will produce the original at the hearing of the case for which this affidavit is taken. On July 31, 1880, I also purchased of said Klemm, at his said residence, the said Exhibit Klemm Battery Telephone. I annex a copy of the bill for said instrument, and will produce the original at the hearing. He told me then that this was the kind that he and his associates intended to put out. That he expected to supply such telephones for use as electric speaking telephones in Harlem and elsewhere, in New York City. That such telephones, both battery and magneto, furnished by him and his associates, were in use in New York City and at Harlem, and that they were arranging to sell them to be used in other parts of the United States. That a line equipped with said telephones, furnished by him, could be found at the place of Mr. Groesman, No. 211 Canal Street, New York City. I went to said Groesman's place, No. 211 Canal Street, and there found one station of a telephone line, and talked over it. On Sept. 11, 1880, I again saw Mr. Klemm at his said residence. He told me that a company got up for the purpose was about to manufacture and sell electric speaking telephones like those I had purchased of him; that he was interested in said company; that Mr. Richard McCormick, of New York, was its president, Mr. Loth, of Cincinnati, was treasurer, and that Mr. Marx, of New York, was its manager; that an executive office for it was being fitted up at No. 4 East 14th Street, New York; that as soon as arrangements could be completed, they should endeavor to establish exchanges and sell telephones. I understood from him that they had applied for patents on some alleged inventions of Drawbaugh. The building No. 4

East 14th Street, New York, has at the street door a sign, "People's Telephone Co." Up one flight of stairs there is an office with the same name on the door. About the middle of September, 1880, I called at that office and found Mr. Marcus Marx there. In conversation he told me that The People's Telephone Co. had begun to furnish telephones and were putting in a few, but he refused to tell me where. He handed me a business card, which is as follows: "The People's Telephone Co. Marcus Marx, manager, New York. Office, 4 East 14th Street." I have the original ready to be produced. I asked him to let me see one of the telephones they were putting in and he said he would do so later. I called on him again on Sept. 25, 1880, at the same office. He declined to show me any telephones, or to tell me where he or his company had put them up, or to give me any information about the subject, stating as a reason that he knew I was employed by the Bell Telephone Company.

E. L. BRADLEY.

Sworn to before me this twelfth day of October, 1880.

RICHARD E. O'BRIEN,
[SEAL] *Notary Public, Kings' County.*
(Cert. filed in N. Y. C.)

NEW YORK, June 11, 1880.

MR. CASH,
To F. A. KLEMM, DR.

1 pair telephones	$14 00

Rec'd payment,

F. A. KLEMM.

NEW YORK, July 31, 1880.

MR. CASH,
To F. A. KLEMM, DR.

To (1) telephone transmitter	$9 00

Rec'd payment,

F. A. KLEMM.

AMERICAN BELL TELEPHO

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2 Sheets—Sheet 1.

A. G. BELL.

TELEGRAPHY.

No. 174,465. Patented March 7, 1876.

Fig. 1.

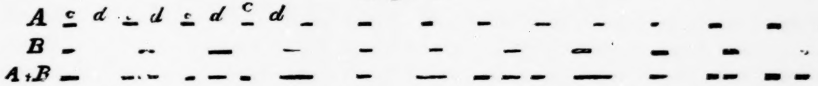


Fig. 2.

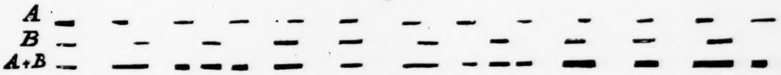


Fig. 3

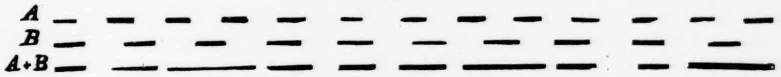


Fig. 4.

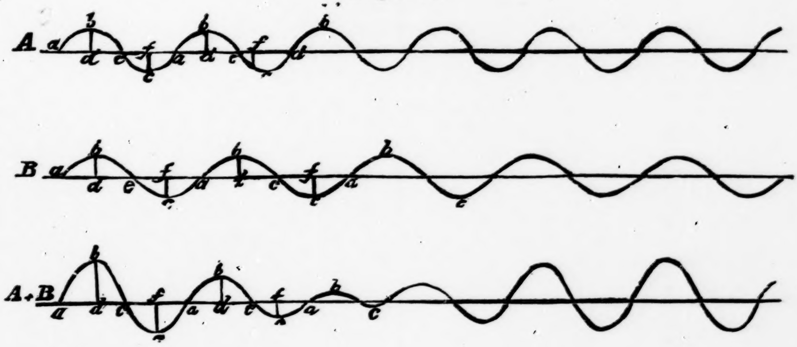
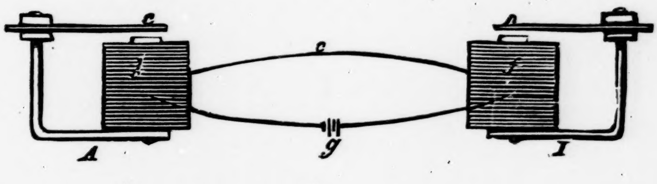

A
B
A+B
a
b
c
d
e
f

Fig. 5.



Witnesses:

Ewell A. Dick

W. J. Hutchinson

Inventor:

A. Graham Bell

by attys Pollok & Bailey

EPHONE COMPANY,-3

2 Sheets—Sheet 2

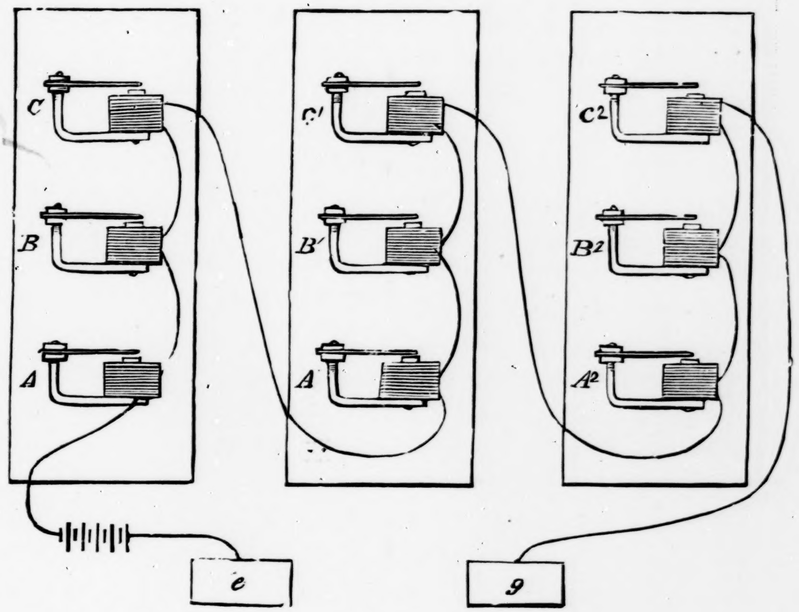
A. G. BELL.

TELEGRAPHY

No. 174,465.

Patented March 7, 1876

Fig. 6.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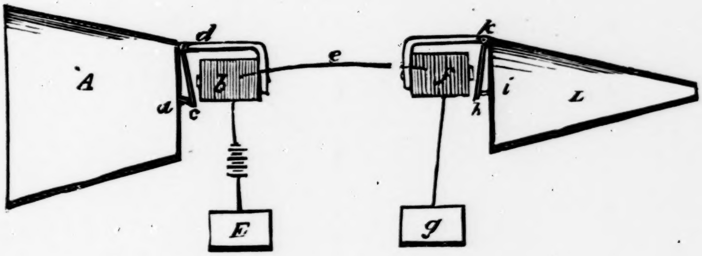
A2
e
g

Fig. 7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Witnesses:

Ewell Dick.
H. J. Hutchinson

Inventor:

A. Graham Bell
by atty Pollok & Bailey

AMERICAN BELL TELEPHO

EPHONE COMPANY,-3

UNITED STATES PATENT OFFICE.

ALEXANDER GRAHAM BELL, OF SALEM, MASSACHUSETTS.

IMPROVEMENT IN TELEGRAPHY.

Specification forming part of Letters Patent No. 174,465, dated March 7, 1876; application filed Febuary 14, 1876.

To all whom it may concern:

Be it known that I, ALEXANDER GRAHAM BELL, of Salem, Massachusetts, have invented certain new and useful Improvements in Telegraphy, of which the following is a specification: —

In Letters Patent granted to me April 6, 1875, No. 161,739, I have described a method of, and apparatus, for transmitting two or more telegraphic signals simultaneously along a single wire by the employment of transmitting instruments, each of which occasions a succession of electrical impulses differing in rate from the others; and of receiving instruments, each tuned to a pitch at which it will be put in vibration to produce its fundamental note by one only of the transmitting instruments; and of vibratory circuit-breakers operating to convert the vibratory movement of the receiving instrument into a permanent make or break (as the case may be) of a local circuit, in which is placed a Morse sounder, register, or other telegraphic apparatus. I have also therein described a form of autograph-telegraph based upon the action of the above-mentioned instruments.

In illustration of my method of multiple telegraphy I have shown in the patent aforesaid, as one form of transmitting instrument, an electro-magnet having a steel-spring armature, which is kept in vibration by the action of a local battery. This armature in vibrating makes and breaks the main circuit, producing an intermittent current upon the line-wire. I have found, however, that upon this plan the limit to the number of signals that can be sent simultaneously over the same wire is very speedily reached; for, when a number of transmitting instruments, having different rates of vibration, are simultaneously making and breaking the same circuit, the effect upon the main line is practically equivalent to one continuous current.

In a pending application for Letters Patent, filed in the United States Patent Office Feburary 25, 1875, I have described two ways of producing the intermittent current — the one by actual make and break of contact, the other by alternately increasing and diminishing the intensity of the current without actually breaking the circuit. The current produced by the latter method I shall term, for distinction sake, a pulsatory current.

My present invention consists in the employment of a vibratory or undulatory current of electricity in contradistinction to a merely intermittent or pulsatory current, and of a method of, and apparatus for, producing electrical undulations upon the line-wire.

The distinction between an undulatory and a pulsatory current will be understood by considering that electrical pulsations are caused by sudden or instantaneous changes of intensity, and that electrical undulations result from gradual changes of intensity exactly analogous to the changes in the density of air occasioned by simple pendulous vibrations. The electrical movement, like the aerial motion, can be represented by a sinusoidal curve or by the resultant of several sinusoidal curves.

Intermittent or pulsatory and undulatory currents may be of two kinds, accordingly as the successive impulses have all the same polarity or are alternately positive and negative.

The advantages I claim to derive from the use of an undulatory current in place of a merely intermittent one are, first, that a very much larger number of signals can be transmitted simultaneously on the same circuit; second, that a closed circuit and single main battery may be used; third, that communication in both directions is established without the necessity of special induction-coils; fourth, that cable despatches may be transmitted more rapidly than by means of an intermittent current or by the methods at present in use; for, as it is unnecessary to discharge the cable before a new signal can be made, the lagging of cable-signals is prevented; fifth, and that as the circuit is never broken a spark-arrester becomes unnecessary.

It has long been known that when a permanent magnet is caused to approach the pole of an electro-magnet a current of electricity is

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induced in the coils of the latter, and that when it is made to recede a current of opposite polarity to the first appears upon the wire. When, therefore, a permanent magnet is caused to vibrate in front of the pole of an electro-magnet an undulatory current of electricity is induced in the coils of the electro-magnet, the undulations of which correspond, in rapidity of succession, to the vibrations of the magnet, in polarity to the direction of its motion, and in intensity to the amplitude of its vibration.

That the difference between an undulatory and an intermittent current may be more clearly understood I shall describe the condition of the electrical current when the attempt is made to transmit two musical notes simultaneously — first upon the one plan and then upon the other. Let the interval between the two sounds be a major third; then their rates of vibration are in the ratio of 4 to 5. Now, when the intermittent current is used the circuit is made and broken four times by one transmitting instrument in the same time that five makes and breaks are caused by the other. A and B, Figs. 1, 2, and 3, represent the intermittent currents produced, four impulses of B being made in the same time as five impulses of A. *c c c*, &c., show where and for how long time the circuit is made, and *d d d*, &c., indicate the duration of the breaks of the circuit. The line A and B shows the total effect upon the current when the transmitting instruments for A and B are caused simultaneously to make and break the same circuit. The resultant effect depends very much upon the duration of the make relatively to the break. In Fig. 1 the ratio is as 1 to 4; in Fig. 2, as 1 to 2; and in Fig. 3 the makes and breaks are of equal duration. The combined effect, A and B, Fig. 3, is very nearly equivalent to a continuous current.

When many transmitting instruments of different rates of vibration are simultaneously making and breaking the same circuit the current upon the main line becomes for all practical purposes continuous.

Next, consider the effect when an undulatory current is employed. Electrical undulations, induced by the vibration of a body capable of inductive action, can be represented graphically, without error, by the same sinusoidal curve which expresses the vibration of the inducing body itself, and the effect of its vibration upon the air; for, as above stated, the rate of oscillation in the electrical current corresponds to the rate of vibration of the including body — that is, to the pitch of the sound produced. The intensity of the current varies with the amplitude of the vibration — that is, with the loudness of the sound; and the polarity of the current corresponds to the direction of the vibrating body — that is, to the condensations and rarefactions of air produced by the vibration. Hence, the sinusoidal curve A or B, Fig. 4, represents, graphically, the electrical undulations induced in a circuit by the vibration of a body capable of inductive action.

The horizontal line *a d e f*, &c., represents the zero of current. The elevations *b b b*, &c., indicate impulses of positive electricity. The depressions *c c c*, &c., show impulses of negative electricity. The vertical distance *b d* or *c f* of any portion of the curve from the zero-line expresses the intensity of the positive or negative impulse at the part observed, and the horizontal distance *a a* indicates the duration of the electrical oscillation. The vibrations represented by the sinusoidal curves B and A, Fig. 4, are in the ratio aforesaid, of 4 to 5 — that is, four oscillations of B are made in the same time as five oscillations of A.

The combined effect of A and B, when induced simultaneously on the same circuit, is expressed by the curve A+B, Fig. 4, which is the algebraical sum of the sinusoidal curves A and B. This curve A+B also indicates the actual motion of the air when the two musical notes considered are sounded simultaneously. Thus, when electrical undulations of different rates are simultaneously induced in the same circuit, an effect is produced exactly analogous to that occasioned in the air by the vibration of the inducing bodies. Hence, the co-existence upon a telegraphic circuit of electrical vibrations of different pitch is manifested, not by the obliteration of the vibratory character of the current, but by peculiarities in the shapes of the electrical undulations, or, in other words, by peculiarities in the shapes of the curves which represent those undulations.

There are many ways of producing undulatory currents of electricity, dependent for effect upon the vibrations or motions of bodies capable of inductive action. A few of the methods that may be employed I shall here specify. When a wire, through which a continuous current of electricity is passing, is caused to vibrate in the

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neighborhood of another wire, an undulatory current of electricity is induced in the latter. When a cylinder, upon which are arranged bar-magnets, is made to rotate in front of the pole of an electro-magnet, an undulatory current of electricity is induced in the coils of the electro-magnet.

Undulations are caused in a continuous voltaic current by the vibration or motion of bodies capable of inductive action; or by the vibration of the conducting-wire itself in the neighborhood of such bodies. Electrical undulations may also be caused by alternately increasing and diminishing the resistance of the circuit, or by alternately increasing and diminishing the power of the battery. The internal resistance of a battery is diminished by bringing the voltaic elements nearer together, and increased by placing them farther apart. The reciprocal vibration of the elements of a battery, therefore, occasions an undulatory action in the voltaic current. The external resistance may also be varied. For instance, let mercury or some other liquid form part of a voltaic circuit, then the more deeply the conducting-wire is immersed in the mercury or other liquid, the less resistance does the liquid offer to the passage of the current. Hence, the vibration of the conducting-wire in mercury or other liquid included in the circuit occasions undulations in the current. The vertical vibrations of the elements of a battery in the liquid in which they are immersed produces an undulatory action in the current by alternately increasing and diminishing the power of the battery.

In illustration of the method of creating electrical undulations, I shall show and describe one form of apparatus for producing the effect. I prefer to employ for this purpose an electro-magnet, A, Fig. 5, having a coil upon only one of its legs *b*. A steel-spring armature, *c*, is firmly clamped by one extremity to the uncovered leg *d* of the magnet, and its free end is allowed to project above the pole of the covered leg. The armature *c* can be set in vibration in a variety of ways, one of which is by wind, and, in vibrating, it produces a musical note of a certain definite pitch.

When the instrument A is placed in a voltaic circuit, *g b e f g*, the armature *c* becomes magnetic, and the polarity of its free end is opposed to that of the magnet underneath. So long as the armature *c* remains at rest, no effect is produced upon the voltaic current, but the moment it is set in vibration to produce its musical note a powerful inductive action takes place, and the electrical undulations traverse the circuit *g b e f g*. The vibratory current passing through the coil of the electro-magnet *f* causes vibration in its armature *h* when the armature *c h* of the two instruments A I are normally in unison with one another; but the armature *h* is unaffected by the passage of the undulatory current when the pitches of the two instruments are different.

A number of instruments may be placed upon a telegraphic circuit, as in Fig. 6. When the armature of any one of the instruments is set in vibration all the other instruments upon the circuit which are in unison with it respond, but those which have normally a different rate of vibration remain silent. Thus, if A, Fig. 6, is set in vibration, the armatures of A^1 and A^2 will vibrate also, but all the others on the circuit will remain still. So if B^1 is caused to emit its musical note the instruments B B^2 respond. They continue sounding so long as the mechanical vibration of B^1 is continued, but become silent with the cessation of its motion. The duration of the sound may be used to indicate the dot or dash of the Morse alphabet, and thus a telegraphic dispatch may be indicated by alternately interrupting and renewing the sound. When two or more instruments of different pitch are simultaneously caused to vibrate, all the instruments of corresponding pitches upon the circuit are set in vibration, each responding to that one only of the transmitting instruments with which it is in unison. Thus the signals of A, Fig. 6, are repeated by A^1 and A^2, but by no other instrument upon the circuit; the signals of B^2 by B and B^1; and the signals of C^1 by C and C^2 — whether A, B^2, and C^1 are successively or simultaneously caused to vibrate. Hence by these instruments two or more telegraphic signals or messages may be sent simultaneously over the same circuit without interfering with one another.

I desire here to remark that there are many other uses to which these instruments may be put, such as the simultaneous transmission of musical notes, differing in loudness as well as in pitch, and the telegraphic transmission of noises or sounds of any kind.

When the armature *c*, Fig. 5, is set in vibration the armature *h* responds not only in pitch but in loudness. Thus, when *c* vibrates with little amplitude, a very soft musical note proceeds

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from *h*; and when *c* vibrates forcibly the amplitude of the vibration of *h* is considerably increased, and the resulting sound becomes louder. So, if A and B, Fig. 6, are sounded simultaneously, (A loudly and B softly,) the instruments A^1 and A^2 repeat loudly the signals of A, and B^1 and B^2 repeat softly those of B.

One of the ways in which the armature *c*, Fig. 5, may be set in vibration has been stated above to be by wind. Another mode is shown in Fig. 7, whereby motion can be imparted to the armature by the human voice or by means of a musical instrument.

The armature *c*, Fig. 7, is fastened loosely by one extremity to the uncovered leg *d* of the electro-magnet *b*, and its other extremity is attached to the centre of a stretched membrane, *a*. A cone, A, is used to converge sound-vibrations upon the membrane. When a sound is uttered in the cone the membrane *a* is set in vibration, the armature *c* is forced to partake of the motion, and thus electrical undulations are created upon the circuit E *b e f g*. These undulations are similar in form to the air vibrations caused by the sound — that is, they are represented graphically by similar curves. The undulatory current passing through the electro-magnet *f* influences its armature *h* to copy the motion of the armature *c*. A similar sound to that uttered into A is then heard to proceed from L.

In this specification the three words "oscillation," "vibration," and "undulation," are used synonymously, and in contradistinction to the terms "intermittent" and "pulsatory." By the term "body capable of inductive action," I mean a body which, when in motion, produces dynamical electricity. I include in the category of bodies capable of inductive action — brass, copper, and other metals, as well as iron and steel.

Having described my invention, what I claim, and desire to secure by Letters Patent, is as follows:

1. A system of telegraphy in which the receiver is set in vibration by the employment of undulatory currents of electricity, substantially as set forth.

2. The combination, substantially as set forth, of a permanent magnet or other body capable of inductive action, with a closed circuit, so that the vibration of the one shall occasion electrical undulations in the other, or in itself, and this I claim, whether the permanent magnet be set in vibration in the neighborhood of the

conducting-wire forming the circuit, or whether the conducting-wire be set in vibration in the neighborhood of the permanent magnet, or whether the conducting-wire and the permanent magnet both simultaneously be set in vibration in each other's neighborhood.

3. The method of producing undulations in a continuous voltaic current by the vibration or motion of bodies capable of inductive action, or by the vibration or motion of the conducting-wire itself, in the neighborhood of such bodies, as set forth.

4. The method of producing undulations in a continuous voltaic circuit by gradually increasing and diminishing the resistance of the circuit, or by gradually increasing and diminishing the power of the battery, as set forth.

5. The method of, and apparatus for, transmitting vocal or other sounds telegraphically, as herein described, by causing electrical undulations, similar in form to the vibrations of the air accompanying the said vocal or other sounds, substantially as set forth.

In testimony whereof I have hereunto signed my name this twentieth day of January, A. D. 1876.

ALEX. GRAHAM BELL.

Witnesses:

Thomas E. Barry,
P. D. Richards.

PHONE COMPANY,-3

2 Sheets—Sheet 1.

A. G. BELL.

ELECTRIC TELEGRAPHY.

No. 186,787. Patented Jan. 30, 1877.

Fig. 1.

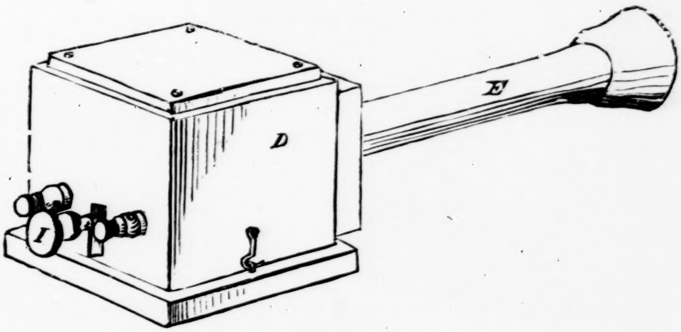


Fig. 2.

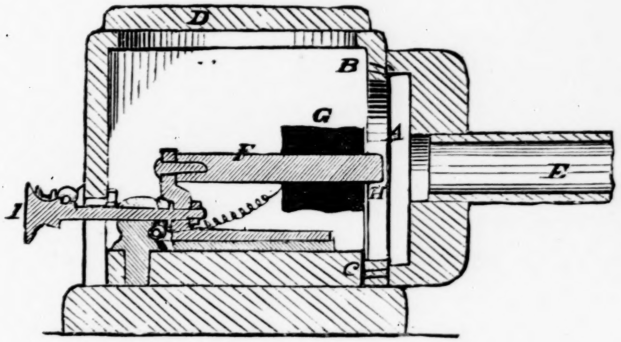
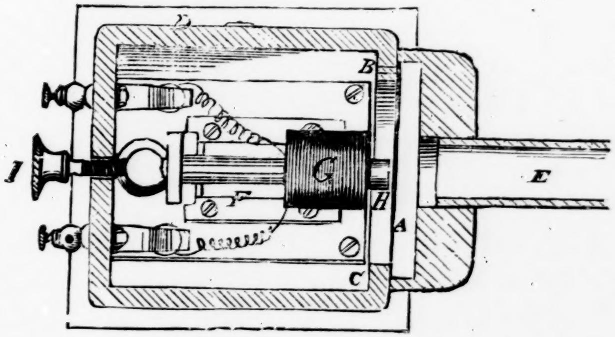


Fig. 3.



Attest:

A. Pollok

Ewell A. Dick

Inventor

Alexander Graham Bell

AMERICAN BELL TELEPHON

PHONE COMPANY,-3

2 Sheets—Sheet 2.

A. G. BELL.

ELECTRIC TELEGRAPHY.

No. 186,787. Patented Jan. 30, 1877.

Fig. 4.

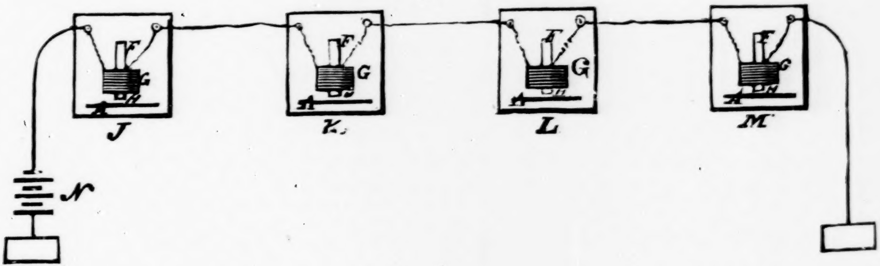


Fig 5.

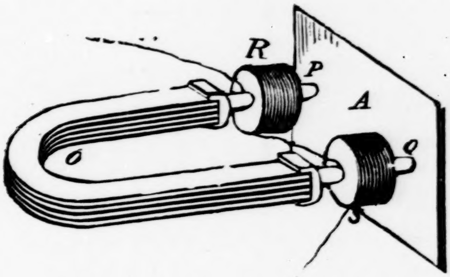
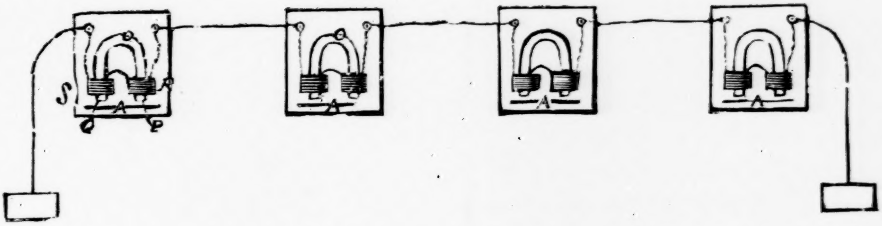


Fig. 6.



Attest:

A. Pollok

Ewell A Dick

Inventor:

Alexander Graham Bell

AMERICAN BELL TELEPHON

UNITED STATES PATENT OFFICE.

ALEXANDER GRAHAM BELL, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN ELECTRIC TELEGRAPHY.

Specification forming part of Letters Patent No. 186,787, dated January 30, 1877; application filed January 15, 1877.

To all whom it may concern:

Be it known that I, ALEXANDER GRAHAM BELL, of Boston, Massachusetts, have invented certain new and useful Improvements in Electric Telephony, of which the following is a specification:

In Letters Patent granted to me the 6th day of April, 1875, No. 161,739, and in an application for Letters Patent of the United States now pending, I have described a method of and apparatus for producing musical tones by the action of a rapidly-interrupted electrical current, whereby a number of telegraphic signals can be sent simultaneously along a single circuit.

In another application for Letters Patent now pending in the United States Patent Office I have described a method of and apparatus for inducing an intermittent current of electricity upon a line-wire, whereby musical tones can be produced and a number of telegraphic signals be sent simultaneously over the same circuit, in either or both directions; and in Letters Patent granted to me March 7, 1876, No 174,465, I have shown and described a method of an apparatus for producing musical tones by the action of undulatory currents of electricity, whereby a number of telegraphic signals can be sent simultaneously over the same circuit, in either or in both directions, and a single battery be used for the whole circuit.

In the applications and patents above referred to, signals are transmitted simultaneously along a single wire by the employment of transmitting-instruments, each of which occasions a succession of electrical impulses differing in rate from the others, and are received without confusion by means of receiving-instruments, each tuned to a pitch at which it will be put in vibration to produce its fundamental note by one only of the transmitting-instruments. A separate instrument is therefore employed for every pitch, each instrument being capable of transmitting or receiving but a single note, and thus as many separate instruments are required as there are messages or musical notes to be transmitted.

My invention has for its object, first, the transmission simultaneously of two or more musical notes or telegraphic signals along a single wire in either or both directions, and with a single battery for the whole circuit without the use of as many instruments as there are musical notes or telegraphic signals to be transmitted; second, the electrical transmission by the same means of articulate speech and sound of every kind, whether musical or not; third, the electrical transmission of musical tones, articulate speech, or sounds of every kind, without the necessity of using a voltaic battery.

In my patent No. 174,465, dated March 7, 1876, I have shown as one form of transmitting-instrument a stretched membrane, to which the armature of an electro-magnet is attached, whereby motion can be imparted to the armature by the human voice, or by means of a musical instrument, or by sounds produced in any way.

In accordance with my present invention I substitute for the membrane and armature shown in the transmitting and receiving instruments alluded to above a plate of iron or steel capable of being thrown into vibration by sounds made in its neighborhood.

The nature of my invention and the manner in which the same is or may be carried into effect will be understood by reference to the accompanying drawings, in which —

Figure 1 is a perspective view of one form of my electric telephone. Fig. 2 is a vertical section of the same, and Fig. 3 is a plan view of the apparatus. Fig. 4 is a diagram illustrating the arrangement upon circuit.

Similar letters in the drawings represent corresponding portions of the apparatus.

A in said drawings represents a plate of iron or steel, which is fastened at B and C to the cover or sounding-box D. E represents a speaking-tube, by which sounds may be conveyed to or from the plate A. F is a bar of soft iron. G is a coil of insulated copper wire, placed around the extremity of the end H of the bar F. I is an adjusting-screw, whereby the distance of the end H from the plate A may be regulated.

The electric telephones J, K, L, and M are placed at different stations upon a line, and are arranged upon circuit with a battery, N, as shown in diagram, Fig. 4.

I have shown the apparatus in one of its simplest forms, it being well understood that the same may be varied in arrangement, combination, general construction, and form, as well as material of which the several parts are composed.

The operation and use of this instrument are as follows:

I would premise by saying that this instrument is and may be used both as a transmitter and as a receiver — that is to say, the sender of the message will use an instrument in every particular identical in construction and operation with that employed by the receiver, so that the same instrument can be used alternately as a receiver and a transmitter.

In order to transmit a telegraphic message by means of these instruments, it is only necessary for the operator at a telephone (say J) to make a musical sound in any way in the neighborhood of the plate A — for convenience of operation, through the speaking-tube E — and to let the duration of the sound signify the dot or dash of the Morse alphabet, and for the operator who receives his message (say at M) to listen to his telephone, preferably through the speaking-tube E. When two or more musical signals are being transmitted over the same circuit all the telephones reproduce the signals for all the messages; but as the signals for each message differ in pitch from those for the other messages, it is easy for an operator to fix his attention upon one message and ignore the other.

When a large number of despatches are being simultaneously transmitted it will be advisable for the operator to listen to his telephone through a resonator, which will re-enforce to his ear the signals which he desires to observe. In this way he is enabled to direct his attention to the signals for any given message without

AMERICAN BELL TELEPHO

being distracted or disturbed by the signals for any other messages that may be passing over the line at the time.

The musical signals, if preferred, can be automatically received by means of a resonator, one end of which is closed by a membrane, which vibrates only when the note with which the resonator is in unison is emitted by the receiving-telephone. The vibrations of the membrane may be made to operate a circuit-breaker, which will actuate a Morse sounder or a telegraphic recording or registering apparatus.

One form of vibratory circuit-breaker which may be used for this purpose I have described in Letters Patent No. 178,399, June 6, 1876. Hence by this plan the simultaneous transmission of a number of telegraphic messages over a single circuit in the same or in both directions with a single main battery for the whole circuit and a single telephone at each station is rendered practicable. This is of great advantage in this, that for the conveyance of several messages, or signals, or sounds over a single wire simultaneously, it is no longer necessary to have separate instruments correspondingly tuned for each given sound, which plan requires nice adjustment of the corresponding instruments, while the present improvement admits of a single instrument at each station, or, if for convenience several are employed, they are all alike in construction, and need not be adjusted or tuned to particular pitches.

Whatever sound is made in the neighborhood of any telephone — say at J, Fig. 4 — is echoed in fac-simile by the telephones of all the other stations upon the circuit; hence this plan is also adapted for the use of the transmitting intelligibly the exact sounds of articulate speech. To convey an articulate message it is only necessary for an operator to speak in the neighborhood of his telephone, preferably through the tube E, and for another operator at a distant station upon the same circuit to listen to the telephone at that station. If two persons speak simultaneously in the neighborhood of the same or different telephones, the utterances of the two speakers are reproduced simultaneously by all the other telephones on the same circuit; hence by this plan a number of vocal messages may be transmitted simultaneously on the same circuit, in either or both directions. All the effects noted above may be produced by the

EPHONE COMPANY,-3

same instruments without a battery by rendering the central bar F H permanently magnetic. Another form of telephone for use without a battery is shown in Fig. 5, in which O is a compound permanent magnet, to the poles of which are affixed poll-pieces of soft iron, P Q, surrounded by helices of insulated wire R S.

Fig. 6 illustrates the arrangement upon circuits of similar instruments to that shown in Fig. 5.

In lieu of the plate A in above figures, iron or steel reeds of definite pitch may be placed in front of the electro-magnet O, and, in connection with a series of such instruments of different pitches, an arrangement upon circuit may be employed similar to that shown in my patent No. 174,465, and illustrated in Fig. 6 of Sheet 2 in said patent. The battery, of course, may be omitted.

This invention is not limited to the use of iron or steel, but includes within its scope any material capable of inductive action.

The essential feature of the invention consists in the armature of the receiving-instrument being vibrated by the varying attraction of the electro-magnet so as to vibrate the air in the vicinity thereof in the same manner as the air is vibrated at the other end by the production of the sound. It is, therefore, by no means necessary or essential that the transmitting-instrument should be of the same construction as the receiving-instrument. Any instrument receiving and transmitting the impression of agitated air may be used as the transmitter, although, for convenience and for reciprocal communication, I prefer to use like instruments at either end of an electrical wire. I have heretofore described and exhibited such other means of transmitting sound, as will be seen by reference to the proceedings of the American Academy of Arts and Sciences, Volume XII.

For convenience, I prefer to apply to each instrument a call-bell. This may be arranged so as to ring, first, when the main circuit is opened; second, when the bar F comes into contact with the plate A. The first is done to call attention; the second indicates when it is necessary to readjust the magnet, for it is important that the distance of the magnet from the plate should be as little as possible, without, however, being in contact. I have also found that the electrical undulations produced upon the main line by the vibration of the plate A are intensified by placing the coil G at the end of the bar F nearest the plate A, and not extend it beyond the middle, or thereabout.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The union upon, and by means of, an electric circuit of two or more instruments, constructed for operation substantially as herein shown and described, so that, if motion of any kind or form be produced in any way in the armature of any one of the said instruments, the armatures of all the other instruments upon the same circuit will be moved in like manner and form, and if such motion be produced in the former by sound, like sound will be produced by the motion of the latter.

2. In a system of electric telegraphy or telephony, consisting of transmitting and receiving instruments united upon an electric circuit, the production, in the armature of each receiving-instrument, of any given motion by subjecting said armature to an attraction varying in intensity, however such variation may be produced in the magnet; and hence I claim the production of any given sound or sounds from the armature of the receiving-instrument by subjecting said armature to an attraction varying in intensity, in such manner as to throw the armature into that form of vibration that characterizes the given sound or sounds.

3. The combination, with an electro-magnet, of a plate of iron or steel, or other material capable of inductive action, which can be thrown into vibration by the movement of surrounding air or by the attraction of a magnet.

4. In combination with a plate and electro magnet, as before claimed, the means herein described, or their mechanical equivalents, of adjusting the relative position of the two so that, without touching, they may be set as closely together as possible.

5. The formation, in an electric telephone such as herein shown and described, of a magnet with a coil upon the end or ends of the magnet nearest the plate.

6. The combination, with an electric telephone such as described, of a sounding box, substantially as herein shown and set forth.

7. In combination with an electric telephone, as herein described,

the employment of a speaking or hearing tube for conveying sounds to or from the telephone, substantially as set forth.

8. In a system of electric telephony, the combination of a permanent magnet with a plate of iron or steel, or other material capable of inductive action, with coils upon the end or ends of said magnet nearest the plate, substantially as set forth.

In testimony whereof I have hereunto signed my name this 13th day of January, A. D. 1877.

A. GRAHAM BELL.

Witnesses:
HENRY R. ELLIOTT,
EWELL A. DICK.

AMERICAN BELL TELEPHON

PHONE COMPANY,-3

BELL TO HUBBARD, TRUSTEE. — ASSIGNMENT OF PATENT RIGHT.

Liber R^{21}, p. 399. [Record, page 20.]

To all whom it may concern:

Whereas, Alexander Graham Bell, of Boston, in the county of Suffolk and State of Massachusetts, did obtain three several Letters Patent of the United States, for an improved system of telegraphy, telephony and telephonic apparatus, which Letters Patent bear date respectively, March seventh, A. D. eighteen hundred and seventy-six, and numbered 174,465, June sixth, A. D. eighteen hundred and seventy-six, and numbered 178,399, and January thirtieth, A. D. eighteen hundred and seventy-seven, and numbered 186,787.

And whereas, Gardiner G. Hubbard, of Cambridge, in the county of Middlesex and State of Massachusetts, trustee, is desirous of acquiring an interest therein; now this indenture witnesseth that for a valuable consideration, viz , one dollar and other valuable consideration to me in hand paid, the receipt of which is hereby acknowledged, I have assigned, sold and set over, and by these presents do assign, sell and set over unto the said Gardiner G. Hubbard, trustee, all the right, title and interest I have in the above described invention, as secured to me by Letters Patent, for, to and in the United States and Territories, and in no other place or places. The same to be held and enjoyed by the said Gardiner G. Hubbard, trustee, for his own use and behoof, and for the use and behoof of his legal representatives, to the full end of the term for which said letters were granted, as fully and entirely as the same would have been held and enjoyed by me had this assignment and sale not been made.

In testimony whereof, I have hereunto set my hand and affixed my seal this day of July, in the year of our Lord one thousand eight hundred and seventy-seven.

ALEXANDER GRAHAM BELL. [SEAL]

Sealed and delivered in presence of

CHAS. EUSTIS HUBBARD.

Recorded July 28, 1877.

HUBBARD, TRUSTEE, TO BELL TELEPHONE COMPANY.

ASSIGNMENT OF PATENT RIGHT.

Liber Y^{22}, p. 460. [Record, page 20.]

To all whom it may concern:

Whereas, Alexander Graham Bell, of Salem, Massachusetts, as assignor to himself, Thomas Sanders and Gardiner G. Hubbard, did obtain Letters Patent of the United States, bearing date April 6, 1875, and numbered 161,739, and whereas said Alexander Graham Bell did obtain Letters Patent of the United States, bearing date March 7, 1876, and numbered 174,465, bearing date June 6, 1876, and numbered 178,399, and bearing date Jan. 30, 1877, and numbered 186,787, all of said Letters Patent being for improvements in "Telegraphy, Telephony and Telephonic Apparatus" invented by said Alexander Graham Bell; and whereas all of said Letters Patent have been assigned to Gardiner G. Hubbard, trustee, said letters numbered 161,739, by deed of assignment, delivered July 9, 1877, and recorded in Liber T^{21}, page 448 of Transfers of Patents; and said letters numbered 174,465, 178,399 and 186,787, by deed of assignment, delivered July 9, 1877, and recorded in Liber R^{21}, page 399 of Transfers of Patents; and said Hubbard, trustee, is now the owner of the above-described inventions secured by said Letters Patent; and whereas the Bell Telephone Company, a corporation duly established under the laws of the Commonwealth of Massachusetts, and located at Boston, is desirous of acquiring the ownership of said inventions secured by said Letters Patent.

Now, this indenture witnesseth that I, Gardiner G. Hubbard, trustee, in consideration of one dollar and other valuable consideration to me in hand paid by said Bell Telephone Company, the receipt whereof is hereby acknowledged, have assigned, sold and set over, and by these presents do assign, sell and set over unto the said Bell Telephone Company all my right, title and interest in the above-described inventions and in and to said Letters Patent, each and all of them, the same to be held and enjoyed by the said Bell Telephone Company for its own use and behoof, and for the use and behoof of its legal representatives, to the full end of the term for which said letters were granted, and any extension or reissue there-

PHONE COMPANY,-3

of, as fully and entirely as the same would have been held and enjoyed by me had this assignment and sale not been made.

In testimony whereof, I have hereunto set my hand and seal this twentieth day of July, in the year eighteen hundred and seventy-eight, being thereto duly authorized.

GARDINER G. HUBBARD, *Trustee.* [SEAL]

In presence of
C. E. HUBBARD,
R. W. DEVONSHIRE.

Recorded Oct. 3, 1878.

BELL TELEPHONE CO. TO AMERICAN BELL TELEPHONE CO.

Liber I^{25}, p. 282. [Record, page 20.]

Know all men by these presents:

That the Bell Telephone Company, a corporation established under the laws of the Commonwealth of Massachusetts, in consideration of one dollar, to it paid by the American Bell Telephone Company, a corporation established under the laws of said Commonwealth, the receipt whereof is hereby acknowledged, does hereby grant and convey unto said American Bell Telephone Company the exclusive right, under the following patents, to all the territory of the United States except the State of Massachusetts, viz.: Letters Patent No. 174,465, issued March 7, 1876, to Alexander Graham Bell, for an improvement in telegraphy, and Letters Patent No. 186,787, issued January 30, 1877, to said Alexander Graham Bell, for an improvement in electric telegraphy, and in and to the inventions therein described or intended to be described. To have and to hold the same to the said American Bell Telephone Company, its successors and assigns, to their own use and behoof forever. This instrument is made at the request of the National Bell Telephone Company, in pursuance of an agreement between said Bell Telephone Company and said National Bell Telephone Company, dated March 20, 1879, said American Bell Telephone Company being the appointees of said National Bell Telephone Company to receive this conveyance, and in pursuance of an agreement between said National Bell Telephone Company and said American Bell Telephone Company, dated May 8, 1880.

In witness whereof, said Bell Telephone Company has caused its corporate seal to be hereto affixed, and these presents to be signed in its name and behalf, by William H. Forbes, its president, and William R. Driver, its treasurer, thereto duly authorized; this twenty-second day of June, A. D. 1880.

THE BELL TELEPHONE COMPANY.

{ L. S.
Bell Telephone Company,
Incorporated 1878. }

By W. H. FORBES, *Prest.*
WM. R. DRIVER, *Treas.*

Recorded June 24, 1880. *Ex'd, S. P. P., H. M. L.*

ACT INCORPORATING THE AMERICAN BELL TELEPHONE COMPANY.

[Record, page 20.]

Chapter 117.

COMMONWEALTH OF MASSACHUSETTS.

IN THE YEAR ONE THOUSAND EIGHT HUNDRED AND EIGHTY.

AN ACT

TO INCORPORATE THE AMERICAN BELL TELEPHONE COMPANY.

Be it enacted by the Senate and House of Representatives, in General Court assembled, and by the authority of the same, as follows: —

Section 1. Alexander Graham Bell, William H. Forbes, George Z. Silsbee, Richard S. Fay, Alexander Cochrane, George L. Bradley, Francis Blake, Jr., Thomas Sanders and Charles Eustis Hubbard, and their associates, may associate themselves and organize a corporation according to the provisions of chapter two hundred and twenty-four of the Acts of the year eighteen hundred and seventy, and the Acts in amendment thereof and addition thereto, for the purpose of manufacturing, owning, selling, using and licensing others to use, electric speaking telephones and other apparatus and appliances pertaining to the transmission of intelligence by electricity, and for that purpose constructing and maintaining by itself and its licensees public and private lines and district exchanges, with a capital stock exceeding one million of dollars, and not exceeding ten millions of dollars.

Section 2. For the purposes aforesaid, said Corporation may become a stockholder in or become interested with other corporations hereafter organized for like purposes, or already established for the transaction of telephonic business under its patents and no others; provided, that said Corporation shall not become a stockholder in any other corporation doing business in this State to an amount exceeding thirty per cent of the capital stock of said last named corporation. And it and its licensees may, with this Commonwealth, enjoy the rights given by chapter sixty-four of the

General Statutes and Acts amendatory thereof, and shall be subject to the liabilities therein imposed; but section ten of said chapter shall only apply to their public lines; and the apportionment provided by section five of chapter two hundred and eighty-three of the Acts of the year eighteen hundred and sixty-five and Acts amendatory thereof, shall be made upon the number of telephones in use by it, or under its authority, or with its permission, or under letters patent owned or controlled by it within and without this Commonwealth respectively; and the returns to be made under said Act shall state the facts required for such apportionment in such form as the Tax Commissioner may determine; and it shall be the duty of said Tax Commissioner, or his deputy, to annually examine the books, accounts and papers of said corporation, so far as may be necessary for the verification of said returns.

SECTION 3. When an injury is done to a person or to property by the posts, wires, telephones, or other apparatus of the Corporation, caused by any negligence on the part of itself or its officers, or on the part of any of its agents, servants, employees or operatives, the Corporation shall be responsible in damages to the party injured.

SECTION 4. The franchise or charter of said Corporation shall not be sold or offered for sale, or leased, to any company, or to any person or association of persons, without the consent of the Legislature; and any contract made contrary to the provisions of this Act shall be void. And this charter may be revoked by the Legislature for any cause which they deem sufficient.

SECTION 5. The provisions of the first and second sections of the three hundred and tenth chapter of the Acts of the year eighteen hundred and sixty-eight shall apply to said telephone company and its licensees.

Said Corporation shall be subject to all general laws that now are, or that may be hereafter in force, relating to similar corporations, so far as the same shall not be inconsistent with the provisions of this Act.

SECTION 6. This Act shall take effect upon its passage.

PHONE COMPANY,-3

HOUSE OF REPRESENTATIVES, March 12th, 1880.

Passed to be enacted.

CHAS. J. NOYES,
Speaker.

IN SENATE, March 17th, 1880.

Passed to be enacted.

ROBERT R. BISHOP,
President.

MARCH 19th, 1880.

Approved.

JOHN D. LONG.

SECRETARY'S DEPARTMENT,
BOSTON, Jan. 6, 1881.

A true copy.

Witness the seal of the Commonwealth.

[SEAL] HENRY B. PEIRCE,
Secretary of the Commonwealth of Massachusetts.

AMERICAN BELL TELEPHON

CERTIFICATE OF INCORPORATION OF THE AMERICAN BELL TELEPHONE COMPANY.

[RECORD, PAGE 20.]

No. 1077.

COMMONWEALTH OF MASSACHUSETTS.

Be it known that whereas W. H. Forbes, George L. Bradley, G. Z. Silsbee, Charles Eustis Hubbard, Francis Blake, W. G. Saltonstall, Richard S. Fay, R. W. Devonshire, Charles Emerson, Thomas B. Bailey, and C. M. Whitcomb have associated themselves with the intention of forming a corporation under the name of the American Bell Telephone Company, for the purpose of manufacturing, owning, selling, using and licensing others to use, electric speaking telephones and other apparatus and appliances pertaining to the transmission of intelligence by electricity, and for that purpose constructing and maintaining by itself and its licensees public and private lines and district exchanges with a capital of seven million three hundred and fifty thousand dollars, and have complied with the provisions of the Statutes of this Commonwealth in such case made and provided, as appears from the certificate of the President, Treasurer and Directors of said corporation, duly approved by the Commissioner of Corporations, and recorded in this office:

Now, therefore, I, Henry B. Peirce, Secretary of the Commonwealth of Massachusetts, do hereby certify that said W. H. Forbes, G. L. Bradley, G. Z. Silsbee, C. E. Hubbard, F. Blake, W. G. Saltonstall, R. S. Fay, R. W. Devonshire, C. Emerson, T. B. Bailey and C. M. Whitcomb, their associates and successors, are legally organized and established as and are hereby made an existing corporation under the name of the American Bell Telephone Company, with the powers, rights and privileges, and subject to the limitations, duties and restrictions, which by law appertain thereto.

[SEAL] Witness my official signature hereunto subscribed, and the seal of the Commonwealth of Massachusetts hereunto affixed this seventeenth day of April, in the year of our Lord one thousand eight hundred and eighty.

(Signed)
HENRY B. PEIRCE,
Secretary of the Commonwealth.

COMMONWEALTH OF MASSACHUSETTS.

SECRETARY'S DEPARTMENT,
BOSTON, December 24, 1880.

I hereby certify, that the foregoing is a true copy of the Certificate of Incorporation of the American Bell Telephone Company, organized under the provisions of chapter two hundred and twenty-four of the Acts of the year eighteen hundred and seventy (and Act 1880, 217), having "the force and effect of a special charter," as appears by the records of this Department.

Witness the seal of the Commonwealth.

[SEAL] HENRY B. PEIRCE,
Secretary of the Commonwealth.

COMMONWEALTH OF MASSACHUSETTS.

SECRETARY'S DEPARTMENT,
BOSTON, December 24, 1880.

EXTRACT FROM SECTION 11 OF CHAPTER 224 OF THE ACTS OF THE YEAR 1870.

"The Secretary of the Commonwealth shall sign the same and cause the seal of the Commonwealth to be thereto affixed, and such certificate shall have the force and effect of a special charter, and be conclusive evidence of the organization and establishment of such corporation. The secretary shall also cause a record of such certificate to be made, and a copy of such record, duly certified, may, with like effect as the original certificate, be given in evidence to prove the organization and establishment of such corporation."

I hereby certify that the foregoing is a true copy of a portion of Section 11 of Chapter 224 of the Acts of 1870; that the said section is in force, and that the certificate of incorporation of which the annexed is a copy, is a certificate issued under and in pursuance of said section of said Act.

Witness the seal of the Commonwealth.

[SEAL] HENRY B. PEIRCE,
Secretary of the Commonwealth.

F. A. KLEMM.

Telephone-Transmitter.

No. 235,635. **Patented Dec. 21, 1880.**

Fig: 1.

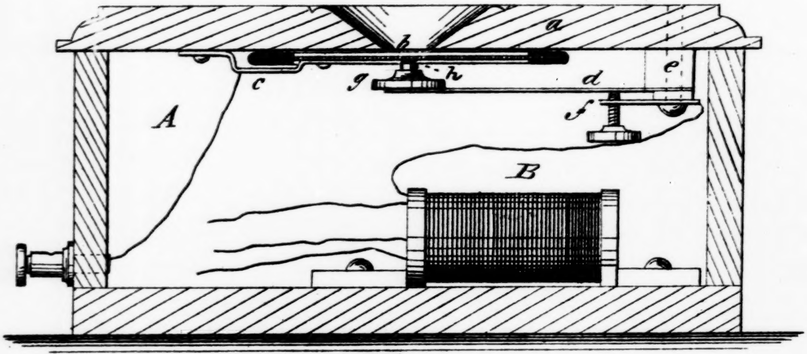
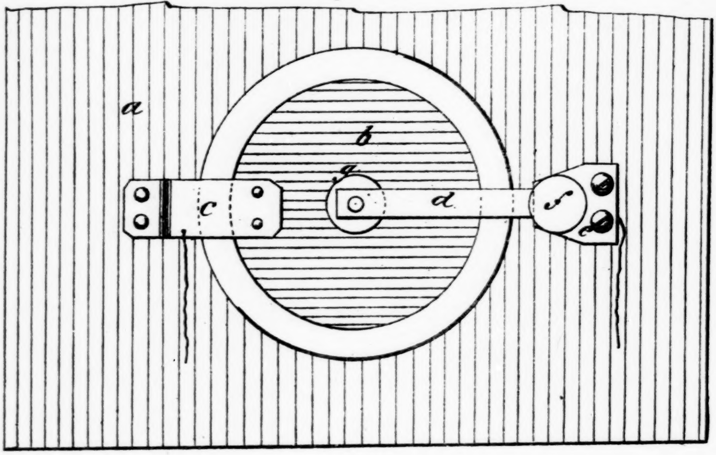

a
b
h
c
g
d
e
f
A
B

Fig: 2.



WITNESSES:

Chas. Nida

C. Sedgwick

INVENTOR:

F. A. Klemm

Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

FRANK A. KLEMM, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE PEOPLE'S TELEPHONE COMPANY, OF SAME PLACE.

TELEPHONE-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 235,635, dated December 21, 1880.

Application filed November 18, 1879.

To all whom it may concern:

Be it known that I, FRANK A. KLEMM, of the city, county, and State of New York, have invented a new and useful Improvement in Telephone-Transmitters, of which the following is a specification.

The object of my invention is to simplify the construction and connections of transmitting-instruments for telephone-lines, and to obtain a more perfect operation than heretofore; and the invention consists in a diaphragm suspended upon an arm, or as a spring-tongue, and an adjustable spring-arm carrying the carbon contact-point, combined together. These features will be particularly described with reference to the accompanying drawings, wherein—

Figure 1 is a sectional elevation of the transmitter. Fig. 2 is a back view of the mouth-piece and diaphragm.

Similar letters of reference indicate corresponding parts.

A is the box of the instrument, which may be of any desired form, and is fitted at the top with the mouth-piece *a*. B is the induction-coil. *b* is the diaphragm, attached to the under side of piece *a* by the metal arm *c*. *d* is a spring-arm fixed upon a post, *e*, that is attached to the under side of piece *a*. *f* is the adjusting-screw, sustained in an extension from post *e* and bearing on the spring *d*. *g* is the carbon-holder attached upon the outer end of spring *d*.

The connections to the local circuit with battery are from the arm *c* to a binding-post at the side of the box A, and from the post *e* to the primary of coil B, and from thence to a second binding-post. The secondary of coil B is connected to the main line.

The arm *c*, sustaining the diaphragm *b*, is constructed of spring metal, and tends to press the diaphragm in contact with the piece *a*. The diaphragm is damped by a ring of rubber or other material attached upon its edges, and is fitted at its center with a point of platinum.

The spring-arm *d*, carrying the carbon-holder, tends to separate the contact-points, and its position is regulated by screw *f*.

It will be seen that this construction is very simple. The diaphragm is substantially a spring-tongue, its vibrations being upon its support *c*, and its movement vibrates the arm *d*. The movements of *b* would be naturally more sluggish than the movements of *d*, and the change of resistance is due to that difference, regulated by the pressure given by screw *f*.

It will be observed that, the diaphragm *b* having a platinum point arranged in its center, as shown at *h*, Fig. 1, and connected by a metallic spring-arm, *c*, to the mouth-piece, and said arm having connection in the manner described with the local circuit, the diaphragm becomes in itself one of the electrodes, and that the spring-arm *c* permits the diaphragm to vibrate freely, even though it is in constant contact with the carbon point secured to the end of the spring-electrode *d*.

I disclaim a spring forming or carrying one electrode of the circuit of a telephone and constantly pressing against the other electrode, to maintain the required initial pressure between the electrodes and yield to the movements of the diaphragm.

I also disclaim a yielding weight carried by a spring connected with the movable electrode, to resist the movements of the diaphragm and modify by its inertia the variations of pressure between the electrodes; and I further disclaim the application of a band of rubber or other similar plastic material to the disk of a telephone to cover the edge and lap over upon both faces.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The diaphragm *b*, connected with the mouth-piece by a spring-arm, *c*, substantially as and for the purpose set forth.

2. In telephone-transmitters, the diaphragm *b*, attached to the mouth-piece by the spring-arm *c*, and the adjustable spring-arm *d*, carrying the carbon-holder, combined and operating substantially as shown and described.

3. In telephone-transmitters, the spring carbon-holder *d* and adjusting-screw, combined with the diaphragm *b*, hung as a spring-tongue, substantially as described and shown.

FRANK A. KLEMM.

Witnesses:
GEO. D. WALKER,
C. SEDGWICK.

AMERICAN BELL TELEPHO

A. G. TI

Magnet-Telephone.

No. 227,861. **Patented May 18, 1880.**

Fig. 1.

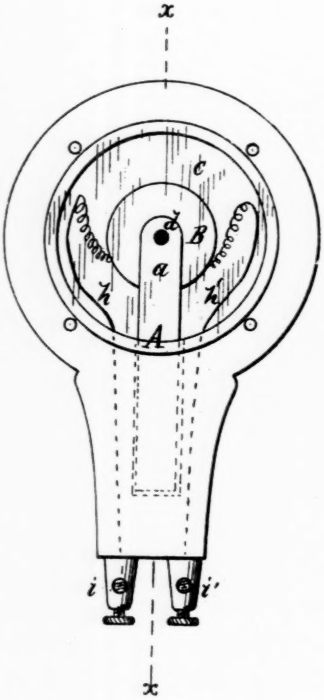
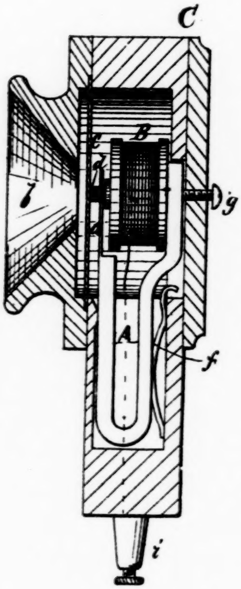

x
c
d
B
a
h
h'
A
i
i'
x

Fig. 2.



WITNESSES:

Henry N. Miller

C. Sedgwick

INVENTOR:

A. G. Tisdel

BY Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

ABNER G. TISDEL, OF ILION, ASSIGNOR TO FRANK A. KLEMM AND ERNEST MARX, OF NEW YORK, N. Y., SIMON WOLF, OF WASHINGTON, D. C., AND MORITZ LOTH, OF CINCINNATI, OHIO.

MAGNET-TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 227,861, dated May 18, 1880.

Application filed November 14, 1879.

To all whom it may concern:

Be it known that I, ABNER G. TISDEL, of Ilion, in the county of Herkimer and State of New York, have invented a new and useful Improvement in Speaking-Telephones, of which the following is a specification.

My improvements relate to the class of telephones using a permanent magnet and induction-coil, whereby the magnetic vibrations of the poles caused by the induced current and vibrations in magnetic force produce the sound-waves by action upon a diaphragm, or, reversely, the variations in magnetic force and vibration of the magnet are produced by the sound-waves acting on the diaphragm.

My invention consists in the combination and construction of parts, as hereinafter described and claimed, whereby freedom of vibration of the diaphragm of a telephonic transmitter and receiver is controlled so that the effect of the force of the magnetic current may be easily regulated at will.

Figure 1 is a front elevation of the instrument, the mouth-piece being removed. Fig. 2 is a cross-section on the line *x x* of Fig. 1.

Similar letters of reference indicate corresponding parts.

A is a permanent magnet of U form, having one pole surrounded by the induction-coil B, and its other pole terminating in a thin metallic tongue, *a*. The coil B is upon a right-angled extension of the pole which projects contiguous to the tongue *a*, so that both poles of the magnet are within the magnetic field. These parts are fitted in a case, C, having a mouth-piece, *b*, beneath which is clamped the diaphragm *c*, of mica or other non-conducting material.

Upon the tongue *a* is a small block or point, *d*, of metal, rubber, or other material, which is in mechanical contact with diaphragm *c*.

The magnet A extends into a recess of the case B, in which is a spring, *f*, that tends to press the other end of the magnet away from the diaphragm *c*, and in the back of the case a screw, *g*, is fitted, bearing upon the magnet against the pressure of spring *f*, so that by turning screw *g* the pressure of the block *d* upon the diaphragm may be regulated.

The connecting-wires *h h'* from coil B connect with the binding-posts *i i'*, respectively, for connection with the circuit that is to contain a similar instrument.

The instrument in the form shown is adapted for transmitting or receiving.

In operation as a transmitter the vibrations of the diaphragm will cause the vibration of the tongue *a* to and from the other pole of the magnet. Such vibrations being entirely within the magnetic field, the magnetic force and induced current will vary with the extent of vibration. These variations in the induced current act in the receiving-instrument to vary the magnetic force of the induction-coil and the tongue *b* and diaphragm *c* of the receiver will be vibrated in harmony with the transmitter to produce articulate sounds.

I am aware that in telephones a permanent magnet has been used with one pole fitted with a helix and the other pole formed as a vibrating diaphragm. In such instruments, to obtain the required amplitude of vibration, the magnet-bar must be shortened to admit a diaphragm of the size required, while in my instrument the vibrating tongue may be short and the poles of the magnet brought closely together. The tongue, being also protected, may be of the most delicate construction.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

In speaking-telephones, the spring *f* and adjusting-screw *g*, combined with the magnet A, diaphragm *c*, block *d*, and case C, substantially as and for the purposes set forth.

ABNER G. TISDEL.

Witnesses:
GEO. D. WALKER,
C. SEDGWICK.

EPHONE COMPANY,-3

CERTIFIED COPY DIGEST ASSIGNMENTS, ETC., TO DEC. 18, 1880, RELATING TO TELEPHONE PATENTS AND INVENTIONS OF DRAWBAUGH, KLEMM & TISDEL.

[Record, page 51.]

UNITED STATES PATENT OFFICE.

To all Persons to whom these Presents shall come, Greeting:

This is to certify that the annexed is a true copy from the Digest of this Office of all assignments, Agreements, Licenses, Powers of Attorney, and other instruments of writing found of record up to and including Dec. 18, 1880, under or relating to Letters Patent granted to, or inventions of Daniel Drawbaugh, Frank A. Klemm and Abner G. Tisdel, relating to Telephones.

In Testimony whereof, I, E. M. Marble, Commissioner of Patents, have caused the seal of the Patent Office to be hereunto affixed this twenty-third day of December, in the year of our Lord one thousand eight hundred and eighty, and of the Independence of the United States the one hundred and fifth.

[SEAL] E. M. MARBLE,
Commissioner.

ASSIGNORS.	ASSIGNEES.	DATE OF ASSIGNMENT.	DATE OF RECORD.	INVENTION.	TERRITORY ASSIGNED.	LIBER.	PAGE.
F. A. Klemm.	F. A. Klemm, Marx & Sons, of New York City and Abner G. Tisdel, of Ilion, N. Y.	Nov. 14, '79	Nov. 17, '79	Telephone Transmitter, oath signed and about to make application [May 4, 1880, 227,270].	His right. The patent to issue to the assignees.	W. 24	85
Same.	Ernest Marx, of New York, N. Y.	Mar. 4, '80	Mar. 10, '80	Telephone Transmitters, filed about Nov. 17, 1879, and subsequent improvements [Dec. 21, 1880, 235,635.] Specifications dated about Feb. 14, 1880, and now on file in Patent Office [May 4, 1880, 227,270]. And induction coils filed about Jan. 12, 1880, and Telephone Repeaters about to make application, and Telephone Receivers about to make application, and Telephones, Telephone Transmitters, Telephone Repeaters and other apparatus appertaining to Telephones for which improvements when completed, intends to make application.	His right. The patent to issue to the assignee.	H. 25	29
Abner G. Tisdel, Frank A. Klemm, Marx & Son.	Same.	May 4, '80.	Mar. 10, '80	Telephone Transmitters, application pending [May 4, 1880, 227,270].	Their right. The patent to issue to the assignee. See Liber W. 24, page 85.	H. 25	31

ASSIGNORS.	ASSIGNEES.	DATE OF ASSIGNMENT.	DATE OF RECORD.	INVENTION.	TERRITORY ASSIGNED.	LIBER.	PAGE.
Ernest Marx.	F. A. Klemm, of New York City.	Mar. 6, '80	Mar. 10, '80	Telephone Transmitters, filed about Nov. 17, 1879, and Telephone Transmitters, filed about Feb. 1880. And Induction coils about Jan. 12. 1880 [May 4, 1880, 227,270]; and Telephone Repeaters and Transmitters about to make application, and Telephone Transmitters, Repeaters, Receivers, and other apparatus relating to Telephones — applications intended to be made; and Abner G. Tisdel, Speaking Telephones.	One undivided three tenths part in each and all of said improvements and inventions, and in and to all and any patents that may be granted therefor. Patents to issue to assignee for his interest.	H. 25	32
Ernest Marx.	Moritz Loth, of Cincinnati, O.	Mar. 6, '80.	Mar. 10, '80	Telephone Transmitters, filed about Nov. 17, 1879. Dec. 21, 1880, 235,635. Telephone Transmitters filed about Feb., 1880 [May 4, 1880 227,270]; and Induction coils about Jan. 12, 1880 [May 11, 1880, 227,546.] Telephone Repeaters and Transmitters about to make application, and Telephone Transmitters, Repeaters, Receivers, and other apparatus relating to Telephones applications intended to be made, and Abner G. Tisdel, Speaking Telephones.	One undivided one fifth part in each and all of said improvements and inventions, and one undivided one fifth part in any and all patents that may be granted therefor. Patents to issue to assignee for his interest.	H. 25	34

ASSIGNORS.	ASSIGNEES.	DATE OF ASSIGNMENT.	DATE OF RECORD.	INVENTION.	TERRITORY ASSIGNED.	LIBER.	PAGE.
Ernest Marx.	Simon Wolf, Washington, D. C.	Mar. 6, '80	Mar. 10, '80	Telephone Transmitters, filed about Nov. 17, 1879. Dec. 21, 1880, 235,635. Telephone Transmitters, filed about Feb., 1880; May 4, 1880, 227,270 And Induction coils filed about Jan. 12, 1880; May 11, 1880, 227,546. Telephone Repeaters and Transmitters about to make application, and Telephone Transmitters, Repeaters, Receivers, and other apparatus relating to Telephones. Applications intended to be made, and Abner G. Tisdel, Speaking Telephones.	One undivided one fifth part, in each and all of said improvements and inventions, and a like interest in any and all patents that may be granted therefor. Patents to issue to assignee for his interest.	H. 25	37
Mutual agreement between	Ernest Marx and Frank A. Klemm, of New York City, Moritz Loth, of Cincinnati, O., and Simon Wolf, of Washington, D. C.	Mar. 6, '80	Mar. 10, '80	Telephone Repeaters, Telephone Receiver and Transmitters, Induction coils and Improvements in Telephones, May 4, 1880, 227,270; and Abner G. Tisdel, Speaking Telephones.	Said parties mutually covenant and agree, one and all each with the other, that each and all of their interests in said improvements and inventions, and the Letters Patent to be issued therefor, shall be merged and consolidated as common stock in a corporate body, under the laws of either of the States of Ohio, New York, or the general laws of the United States, relating to the formation of incorporations in the Dist. of Columbia, or of such other States or territories as may be found necessary hereafter. See record for particulars of the mutual covenants as entered into and agreed upon.	H. 25	39

ASSIGNORS.	ASSIGNEES.	DATE OF ASSIGNMENT.	DATE OF RECORD.	INVENTION.	TERRITORY ASSIGNED.	LIBER.	PAGE.
Same.	Same.	Mar. 8, '80.	Mar. 10, '80	Same.	Mutual agreement between said parties relative to the disposition of any share of stock before the same is issued, but that a joint contract may be made of some of said stock upon the conditions that whatever is realized therefor, shall be divided in proportion to their respective interests, to wit, said Klemm and Marx 3-10 each and Wolf and Loth 1-5 each.	H. 25	42
Frank A. Klemm.	Ernest Marx, of New York, N. Y., Moritz Loth, of Cincinnati, Ohio, and Simon Wolf, of Washington, D. C.	Aug. 12, '80	Aug. 16, '80	Telephone Switch, July 20, 1880, 230,288.	Assigns the undivided three fourths of the whole right, title, and interest in said invention and the Letters Patent therefor, in the proportion of an undivided one fourth to each of said assignees, to the full end of the term for which said Letters Patent are or may be granted.	U. 25	231
Moritz Loth, Frank A. Klemm, Ernest Marx, Simon Wolf.	The People's Telephone Company.	Sept. 4, '80	Oct. 15, '80	Telephone Transmitters, May 4, 1880, 227,270; and Induction coil, May 11, 1880, 227,546; and Abner G. Tisdel, Magnet Telephone,	Assign the whole right, title, and interest in each and all of the patents granted to said Tisdel and Klemm, and to all the inventions of	V. 25	253

ASSIGNORS.	ASSIGNEES.	DATE OF ASSIGNMENT.	DATE OF RECORD.	INVENTION.	TERRITORY ASSIGNED.	LIBER.	PAGE.
				May 11, 1880, 227,861; and Frank A. Klemm, Telephone Switch, July 20, 1880, 230,288; and Telephones and Telephone apparatus, patents pending Dec. 21. 1880, 235,635; and Daniel Drawbaugh, Telephones, applications made on or about July 21, 1880.	said Klemm, for which applications are now pending, and to all said Klemm's inventions for telephones, for which applications may be made, and to all patents that may be granted therefor; and request that said patents may issue to said company. Also assign the exclusive right to the inventions of Daniel Drawbaugh and to the patents that may be granted therefor, and request that said patents may issue to said company. See Liber W. 25, page 85 of Transfers of Patents.		
Mary S. Marx, Ernest Marx, Marx & Son, by Ernest Marx, a member of the firm.	Same.	Oct. 11, '80	Oct. 15, '80	Telephone Transmitters. Specifications dated Feb. 14, 1880, and now on file in the Patent Office, May 4, 1880, 227,270; and Induction coil filed about Jan. 12, 1880; and Telephone Repeater about to make application; and Telephone Receiver about to make application; and Telephones, Telephone apparatus, for which improvements, when completed, he intends to make application.	Assign all their right, title, and interest both as individuals, and as the firm of Marx & Son, in said inventions and patents, acquired by deeds recorded in Liber H. 25, pages 29 and 31 of Transfers of Patents, and in all patents that may be issued hereafter; and request that said patents issue to said company.	V. 25	256

ASSIGNORS.	ASSIGNEES.	DATE OF ASSIGNMENT.	DATE OF RECORD.	INVENTION.	TERRITORY ASSIGNED.	LIBER.	PAGE.
Daniel Drawbaugh	Frank A. Klemm and Ernest Marx, both of New York, N. Y., and Simon Wolf of Washington, D. C., and Moritz Loth of Cincinnati, O.	July 21, '80	July 22, '80	Transmission of Vocal Speech and apparatus to be used for such purpose. About to make appl'n. Spec'n dated July 21, 1880	His right. The patent to issue to the assignees in the proportion an undivided one fourth part to each.	U. 25	85
Abner G. Tisdel.	Abner G. Tisdel of Ilion, N. Y., Marx & Sons, Frank A. Klemm, of New York, N. Y.	Nov. 11, '79	Nov. 13, '79	Speaking Telephone, application made.	His right. The patent to issue to the assignees.	P. 24	465
Same.	Ernest Marx, of New York, N. Y.	Mar. 4, '80	Mar. 10, '80	Speaking Telephones, application now pending. Also improvement in Speaking Telephones or in apparatus relating to Telephones and Telegraphy.	All his right, title and interest in said invention, also in all improvements and inventions he may hereafter make in Speaking Telephones, or in apparatus relating to Telephones and Telegraphy "The patents to issue to the said Marx as the assignee of his entire right, title, and interest in the same." See also Liber P. 24, page 465, of Transfers of Patents.	F. 25	319

ASSIGNORS.	ASSIGNEES.	DATE OF ASSIGNMENT.	DATE OF RECORD.	INVENTION.	TERRITORY ASSIGNED.	LIBER.	PAGE.
Abner G. Tisdel	Same.	Sept. 16, '80	Oct. 4, '80	Telephone Transmitter application. Made oath Sept. 16, 1880.	His right. The patent to issue to the assignee.	S. 25	429
Mary S. Marx, Ernest Marx, comprising the firm of Marx & Son. By Ernest Marx, "a member of the firm."	The People's Telephone Company.	Oct. 11, '80	Oct. 15, '80	Magnet Telephone, May 18, 1880, 227, 861.	All their right, title, and interest, both as individuals and as a firm in said Letters Patent.	V.25	250

EPHONE COMPANY,-3

CERTIFIED COPY AGREEMENT BETWEEN MARX, KLEMM, WOLF AND LOTH.

[Record, page 51.]

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE.

To all persons to whom these presents shall come, greeting:

This is to certify, that the annexed is a true copy from the records of this Office, of an agreement recorded in Liber H 25, p. 39, and that said annexed copy has been compared by me with the original, and that it is a correct transcript thereof, and of the whole of said original.

In testimony whereof, I, E. M. Marble, Commissioner of Patents, have caused the seal of the Patent Office to be hereunto affixed this twenty-first day of January, in the year of our Lord one thousand eight hundred and eighty-one, and of the Independence of the United States the one hundred and fifth.

[SEAL]

E. M. MARBLE,
Commissioner.

Liber H^{25}, p. 39.

Whereas, Ernest Marx, of the city, county and State of New York, is sole owner of an undivided three tenths part of certain improvements in Speaking Telephones, the invention of Abner G. Tisdel, of Ilion, in the county of Herkimer and State of New York, and of the Letters Patent to be issued therefor; and is also sole owner of an undivided three tenths part of certain improvements in Telephone Repeaters, Telephone Receiver and Transmitters, Induction Coils, and certain improvements in Telephones, the inventions of Frank A. Klemm, of the city, county and State of New York, and in the Letters Patent to be obtained therefor. And whereas Frank A. Klemm, of the city, county and State of New York, is sole owner of a like undivided three tenths part in all of said improvements and inventions, and in the Letters Patent to be issued therefor. And whereas Moritz Loth, of the city of Cincinnati, county of Hamilton and State of Ohio, is sole owner of one undivided one fifth part in all of said improvements and inventions, and in the Letters Patent to be issued therefor. And whereas Simon Wolf, of the city of Washington, in the District of Columbia, is sole owner of one undivided one fifth part in all of said improvements and inventions, and in the Letters Patent to be issued therefor. Now this agreement witnesseth, That the said Ernest Marx, Frank A. Klemm, Moritz Loth and Simon Wolf, each and all mutually covenant and agree, one and all, with each other, that each and all of their interests in said improvements and inventions, and in the Letters Patent to be issued therefor, shall be merged and consolidated as common stock in a corporate body, to be formed and created and incorporated under the general laws either of the State of New York, the State of Ohio, or the general laws of the United States relating to the formation of incorporations in the District of Columbia, or of such other States or Territories as may be found necessary hereafter; and each of the parties to this agreement mutually covenant and agree, one and all, with each other, that they will each and all of them retain intact their respective shares, titles and interests in all of said improvements and inventions, and in the Letters Patent to be issued therefor; and that they, each and all of them, will not sell, transfer or assign their respective titles and interests in and to said improvements and inventions, and in the Letters Patent to be issued therefor, except to said corporation or corporations to be hereafter formed and created in accordance with this agreement; and it is further understood and agreed upon by each and all of the parties hereto, that the gross capital of the corporations to be created and formed in accordance with the stipulations hereinbefore set forth shall be represented by stock to be issued for five millions of dollars ($5,000,000), in shares of one hundred dollars each ($100 each), to be distributed to each of the parties hereto in proportions equal to their respective interests in the improvements, inventions and Letters Patent, as hereinbefore set forth, — that is to say, three tenths ($\frac{3}{10}$ths) to Frank A. Klemm, three tenths ($\frac{3}{10}$ths) to Ernest Marx, one fifth ($\frac{1}{5}$th) to Moritz Loth, and one fifth ($\frac{1}{5}$th) to Simon Wolf, — and that each of said parties is at full liberty to dispose of any or all of said stock so issued to him, in accordance with the rules and laws of said corporation or corporations and not otherwise; and each and all of the parties hereto covenants and agrees to surrender, assign, transfer and set over to said corporation or corporations each and all of their respective titles and interests in said improvements, inventions and Letters Patent hereinbefore mentioned and referred to; and that they will, each and all of them, hereafter make, execute and deliver all such deeds, assignments, and other instruments, undertakings and writings that may be found necessary in the premises for the purpose of carrying out the provisions of this agreement.

In testimony of the whole of which the said Ernest Marx, the said Frank A. Klemm, the said Moritz Loth and the said Simon Wolf, have each of them hereunto set their respective hands and seals, this sixth day of March, 1880.

ERNEST MARX. [SEAL]
FRANK A. KLEMM. [SEAL]
M. LOTH. [SEAL]
S. WOLF. [SEAL]

In presence of
John Slote,
Martin Lipmann,
As to the signature of Ernest Marx, the words " and Transmitters," inserted on page 1, before signature and execution.

Lewis Abraham,
R. B. Lawrence,
As to signature of Frank A. Klemm.

Lewis Abraham,
Marcus Marx,
As to signature of M. Loth.

Martin Lipmann,
Joser Loth,
As to signature of S. Wolf.

Recorded March 10, 1880.
Ex'd H. M. H. E. A. M.

CERTIFIED COPY OF AGREEMENT BETWEEN MARX, KLEMM, WOLF AND LOTH.

[Record, page 51.]

Liber H^{25}, page 42.

New York March 8th, 1880.

Frank A. Klemm, Earnest Marx, Simon Wolf, and M. Loth, each and all agree one with the other and all others, that they will not either of them without the consent of all the others assign or make any contract to assign any share of stock before said stock is issued, but that a joint contract may be made to dispose of some of the stock to be issued to such party or parties hereafter agreed upon, with the distinct understanding that whatever is realized therefor shall be divided in equal proportions in accordance with their respective interest- viz; 3/10 to Frank A. Klemm, 3/10 to Earnest Marx, 1/5 to Simon Wolf, 1/5 to Morits Loth.

EARNEST MARX.
FRANK A. KLEMM.
M. LOTH.
S. WOLF.

Recorded March 10, 1880. Ex'd H. M. H. E. A. M.

ASSIGNMENT KLEMM ET AL. TO PEOPLE'S TELEPHONE COMPANY.

[Record, page 51.]

DEPARTMENT OF THE INTERIOR.

UNITED STATES PATENT OFFICE.

To all Persons to whom these Presents shall come, Greeting:

This is to certify that the annexed is a true copy from the records of this office of two (2) assignments recorded in the volumes as stated on the margins of each copy, respectively, and that said annexed copies have been compared by me with the originals, and that they are correct transcripts thereof, and of the whole of said originals.

EPHONE COMPANY,-3

In testimony whereof, I, E. M. Marble, Commissioner of Patents, have caused the seal of the Patent Office to be hereunto affixed, this ninth day of November, in the year of our Lord one thousand eight hundred and eighty, and of the Independence of the United States the one hundred and fifth.

E. M. MARBLE,
Commissioner.

[L. S.]

Whereas, Frank A. Klemm, of the city, county and State of New York, Moritz Loth, of the city of Cincinnati, county of Hamilton, and State of Ohio, Ernest Marx, of the city, county and State of New York, and Simon Wolf, of the city of Washington, District of Columbia, are now owners of the following patents, that is to say: No. 227,270, granted to Frank A. Klemm, dated May, 1880; No. 227,546, granted to Frank A. Klemm, dated May 11th, 1880; No. 227,861, granted to Abner G. Tisdel, dated 11th May, 1880, and No. 230,288, granted to Frank A. Klemm, dated July 20th, 1880, which four patents have been duly assigned to us, as will more fully appear by reference to deeds of assignment, now on record in the United States Patent Office.

And whereas we are also owners of certain improvements in telephones, and telephone apparatuses, the inventions of the said Frank A. Klemm, for which applications for patents are now pending in the United States Patent Office, and further are owners of all inventions of the said Frank A. Klemm relating to telephones, and for the patents that may be issued therefor. And whereas we are also owners of the inventions in telephones made by Daniel Drawbaugh, of Eberly's Mills, Cumberland County, in the State of Pennsylvania, for which applications for patents was made on or about the twenty-first day of July, 1880, and which was assigned to us on the first day of July, 1880, as more particularly appears in a certain deed of assignment recorded in the United States Patent Office, in Liber W 25, page 85, in the book of transfers of patents.

And whereas The People's Telephone Company, a corporation formed under the laws of the State of New York, is desirous of acquiring the entire interest in each and all of said inventions and in the patents that may be issued therefor, and in each and all of the patents that have been issued as hereintofore recited, and in each and all of the applications that are pending hereintofore recited and referred to and in the patents that may be issued therefor;

Now, therefore, to all whom it may concern, be it known that for and in consideration of the sum of four million nine hundred and ninety-nine thousand five hundred and fifty dollars ($4,999,550), represented by ninety-nine thousand nine hundred and ninety-one shares (99,991) in the stock of the said The People's Telephone Company, the receipt whereof is hereby acknowledged, we, the said Frank A. Klemm, Moritz Loth, Ernest Marx and Simon Wolf, have sold, assigned and transferred, and by these presents do sell, assign and transfer unto the said The People's Telephone Company, the whole right, title and interest in, and to each and all of the patents granted to the said Abner G. Tisdel, and the said Frank A. Klemm, as hereinbefore recited, and in and to each and all of the inventions of the said Frank A. Klemm, for which applications are now pending in the United States Patent Office, and in and to the inventions of the said Frank A. Klemm, hereintofore referred to, and in and to the inventions of the said Frank A. Klemm, for which applications for patents may be hereinafter made, and in and to all patents that may be granted therefor; and we hereby authorize and request the Commissioners of Patents to issue any and all patents that may be granted to the said Frank A. Klemm for the inventions hereintofore referred to, to the said The People's Telephone Company, as the assignee, our entire right, title and interest in and to the same for the sole use and behoof of The People's Telephone Company and their legal representatives as fully and entirely as the same would have been held and enjoyed by us had this assignment and sale not been made.

And it is further understood and agreed upon that for the consideration hereinbefore mentioned, and the receipt of which is hereby further acknowledged, we, the said Frank A. Klemm, Moritz Loth, Ernest Marx and Simon Wolf, have sold, assigned and transferred, and by these presents do sell, assign and transfer unto the said The People's Telephone Company the full and exclusive right to the inventions of Daniel Drawbaugh, of Eberly's Mills, Cumberland

County, State of Pennsylvania, and in and to the patents that may be granted therefor as fully set forth and described in the application for Letters Patent filed on or about the twenty-first day of July, 1880, and which is assigned to us as hereinbefore recited; and we hereby authorize and request the Commissioner of Patents to issue any and all Letters Patent that may be granted on the said application of the said Daniel Drawbaugh to the said The People's Telephone Company, as the assignee of the entire right, title and interest in and to the same, for the sole use and behoof of the said The People's Telephone Company and their legal representatives, as fully and as entirely as the same would have been held and enjoyed by us had this assignment and sale not been made. In testimony of which, each of the parties hereunto have affixed their hands and seals, this fourth day of September, 1880, in the city of New York.

MORITZ LOTH. [L. S.]
FRANK A. KLEMM. [L. S.]

Witnesses:
E. P. Ahern.
J. S. Vosburg.

ERNEST MARX. [L. S.]
SIMON WOLF. [L. S.]

Witnesses:
Edwd. P. Ahern.
J. S. Vosburg.
Emanuel Blout.
Charler Herzberger, to S. Wolf.

Recorded October 15, 1880.
Ex'd F. C. F.

ASSIGNMENT MARY S. AND ERNEST MARX TO PEOPLE'S TELEPHONE COMPANY.

[Record, page 51.]

Know all men by these presents that Mary S. Marx and Ernest Marx, of the city, county and State of New York, composing the firm of Marx & Son, for and in consideration of the sum of one hundred dollars to us in hand paid, the receipt whereof is hereby acknowledged, have sold, assigned and transferred, and by these presents do sell, assign and transfer unto The People's Telephone Company, a corporation formed under the laws of the State of New York, all our right, title and interest, both as individuals and as the firm of Marx & Son, in and to the inventions and patents of Frank A. Klemm in telephone transmitters and telephone apparatus described and set forth in a certain deed of assignment from Frank A. Klemm to Ernest Marx, dated March 4th, 1880, and now of record in the United States Patent Office in Liber H 25, page 29, one of the books of record of the Patent Office, and in and to the inventions and improvements of the said Frank A. Klemm, as described and set forth in a certain deed of assignment from Abner G. Tisdel to Frank A. Klemm and Marx & Son, dated fourth day of March, 1880, now of record in the United States Patent Office, in Liber H 25, page 31, one of the books of record of the Patent Office, and all of our rights, title and interest in and to all patents that may be issued hereafter, the inventions of the said Frank A. Klemm, set forth and referred to in said two deeds of assignment now of record before recited; and we do hereby authorize and request the Commissioner of Patents to issue all Letters Patent hereafter granted on the applications of said Klemm, on the inventions and improvements set forth and referred to in said deeds of assignment to the said "The People's Telephone Company," as the assignees of our entire right, title and interest (either as individuals or as a firm), in and to the same, for the sole use and behoof of the said "The People's Telephone Company," and their legal representatives.

In testimony of which we have each of us signed our individual names and placed our seals, and the said Ernest Marx has signed the firm name this eleventh day of October, 1880.

MARY S. MARX. [L. S.]
ERNEST MARX. [L. S.]

Witness:
Adele Marx.
Marcus Marx.

MARX & SON,
By Ernest Marx, a member of the firm.

Witness:
Lewis Abraham,
A. J. Solomons,
As to the signatures of Ernest Marx and Marx & Son.

EPHONE COMPANY,-3

CERTIFIED COPY OF AN ASSIGNMENT FROM DANIEL DRAWBAUGH TO KLEMM ET AL., RECORDED IN LIBER U^{25}, PAGE 85.

Record, page 52.]

Whereas, I, Daniel Drawbaugh, of Eberly's Mills, in the County of Cumberland, and State of Pennsylvania, have invented certain new and useful improvements in the transmission of vocal speech, and the apparatus to be used for such purpose for which I am about to make application for letters patent of the United States. And Whereas Frank A. Klemm, of the City, County and State of New York, Ernest Marx, of the same place, Simon Wolf, of the City of Washington, District of Columbia, and Moritz Loth, of the City of Cincinnati, County of Hamilton, State of Ohio, are each of them desirous of acquiring an interest in said invention, and in the letters patent to be obtained therefor.

Now, therefore, to all whom it may concern, be it known that for and in consideration of the sum of Twenty Thousand Dollars to me in hand paid, the receipt of which is hereby acknowledged, I, the said Daniel Drawbaugh, have sold, assigned and transferred, and by these presents, do sell, assign and transfer, unto the said Frank A. Klemm, Ernest Marx, Simon Wolf and Moritz Loth, the full and exclusive right to the said invention as fully set forth and described in the Specification prepared and executed by me, dated the 21st day of July, 1880, preparatory to obtaining letters patent of the United States therefor, and I do hereby authorize and request the Commissioner of Patents to issue the letters patent for my said invention to the said Frank A. Klemm, Ernest Marx, Simon Wolf, and Moritz Loth each as assignee of one undivided fourth part thereof, for the sole use and behoof of my said named Assignees and each of their legal representatives. In Testimony of which I have hereunto set my hand and affixed my seal this twenty-first day of July, 1880.

DANIEL DRAWBAUGH. [SEAL]

In Presence of
M. W. JACOBS,
E. W. CHELLIS.

Recorded July 22d, 1880.
Ex'd V. E. L.

ARTICLES OF ASSOCIATION OF THE PEOPLE'S TELEPHONE COMPANY.

[Record, page 52.]

State of New York,
County of New York, ss.

We, Joseph Loth, of the city of New York, in the county and State of New York, Julius Bien, of the said city of New York, Richard C. McCormick, of the territory of Arizona, Marcus Marx, of the said city of New York, and Auguste H. Girard, of the said city of New York, do, by these presents, pursuant to and in conformity with the *Act* of the *Legislature* of the *State of New York*, passed on the seventeenth day of February, one thousand eight hundred and forty-eight, entitled "An Act to authorize the formation of Corporations for manufacturing, mining, mechanical, or chemical purposes," and the several acts of the said legislature amendatory thereof associate ourselves together and form a *Company* under the name and style of The People's Telephone Company; and the following are hereby declared to be

The corporate name of the said company.

The objects for which the company is formed.

The amount of the capital stock of the said company.

The number of shares of which the said capital stock of the company shall consist.

The term of existence of the company.

The number of trustees and their names.

The names of those who shall manage the concerns of the said company for the first year.

The names of the town and county in which the operations of the said company are to be carried on: —

1. The corporate name of the said company is hereby declared to be The People's Telephone Company.

2. The objects for which the company is formed are as follows: The manufacturing, constructing, owning, furnishing, maintaining, letting, and selling telephones, and the apparatus used therewith, under the inventions and patents of Abner G. Tisdel, Frank A. Klemm, Daniel Drawbaugh, and other inventions and patents which

may hereafter be assigned to said company, and the doing all things to said business or necessarily connected therewith.

3. The capital stock of the said company shall be five million dollars, which shall be divided into one hundred thousand shares of fifty dollars ($50) each.

4. The said company shall commence on the thirty first day of August, in the year one thousand eight hundred and eighty ('80), and shall continue in existence for the term of fifty (50) years.

5. The number of trustees shall be nine (9). Their names are: Joseph Loth, of the said city of New York, Edgar W. Chellis, of Harrisburg, in the State of Pennsylvania, Julius Bien, of the said city of New York, Richard C. McCormick, of the Territory of Arizona, Marcus Marx, of the said city of New York, Henry D. Cooke, Jr., of Washington, in the District of Columbia, Max D. Gutmann, of Rochester, in the State of New York, Auguste H. Girard, of said city of New York, and John N. Goodwin, of the said city of New York.

The names of those who shall manage the concerns of the said company for the first year are: the said Joseph Loth, Edgar W. Chellis, Julius Bien, Richard C. McCormick, Marcus Marx, Henry D. Cooke, Jr., Max L. Gutmann, Auguste H. Girard, and John N. Goodwin.

6. The name of the town and county in which the operations of the said company are to be carried on: the principal place of business and office of said company will be in the city of New York, in the county and State of New York. The operations of the company will also be carried on in Brooklyn, in the county of Kings, in said State.

Witness our hands and seals this thirtieth day of August, 1880.

[SEAL] JOSEPH LOTH.
[SEAL] JULIUS BIEN.
[SEAL] RICHARD C. McCORMICK.
[SEAL] MARCUS MARX.
[SEAL] AUGUSTE H. GIRARD.

Attest:

WILLIAM H. CLARKSON.

AMERICAN BELL TELEPH

STATE OF NEW YORK,
CITY OF NEW YORK, } SS.
COUNTY OF NEW YORK,

On the thirtieth day of August, in the year one thousand eight hundred and eighty, before me personally came Joseph Loth, Julius Bien, Richard C. McCormick, Marcus Marx, and Auguste H. Girard, known to me to be the individuals described in and who executed the foregoing instrument, and severally acknowledged that they executed the same, they having first signed and sealed the same in my presence.

In witness whereof, I have hereunto set my hand and affixed my notarial seal this thirtieth day of August, A. D. 1880.

[L. S.] WILLIAM H. CLARKSON,
Notary Public,
State of New York, New York,
117 Broadway, N. Y. City.

STATE OF NEW YORK,
CITY AND COUNTY OF NEW YORK, SS.

I, William A. Butler, clerk of the said city and county, and clerk of the Supreme Court of said State for said county, do certify that I have compared the preceding with the original certificate of incorporation on file in my office, and that the same is a correct transcript therefrom, and of the whole of such original.

In witness whereof, I have hereunto subscribed my name and affixed my official seal on this fourteenth day of September, 1880.

[SEAL] WM. A. BUTLER, *Clerk.*

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EVIDENCE FOR COMPLAINANTS IN REPLY.

CIRCUIT COURT OF THE UNITED STATES, SOUTHERN DISTRICT OF NEW YORK, IN EQUITY.

American Bell Telephone Company et al. v. *The People's Telephone Company* et al.

The plaintiffs propose to take the deposition of Mr. T. A. Watson (of Everett, near Boston); whereupon it is agreed that the depositions heretofore given by Mr. Watson, and copies of which are hereto annexed, be put in evidence as his deposition in this cause with the same effect as if given herein before the examiner, and stand as evidence accordingly.

It is also agreed that the deposition of Alexander Graham Bell, referred to by Mr. Watson in his said deposition, also stand as evidence in this cause as if herein taken and sworn to, and a copy shall be filed accordingly. But the complainants shall recall said Bell for further examination or cross-examination, if either party shall so desire and request.

If Mr. Watson shall return from Europe before testimony is closed, the complainants will recall him for further examination or cross-examination, if either party shall so desire and request.

L. HILL, *for Defendants.*
J. J. STORROW, *for Complainants.*

JUNE 1, 1881.

DEPOSITION OF ALEXANDER GRAHAM BELL.

BOSTON, July 8, 1879.

Direct Examination by J. J. STORROW, Esq., *of Counsel for Complainants.*

Int. 1. Please state your name, age, residence, and occupation, and whether you are the Mr. Bell who is mentioned in the bill of complaint in this case.

Ans. I am the Alexander Graham Bell alluded to in the bill of complaint; age, thirty-two years; residence, Cambridge; occupation, electrician.

Int. 2. How early and why was your attention called to the composition and production of vocal sounds?

Ans. My father was a teacher of articulation, and as he intended me to follow his own profession, he very early gave me instruction in the anatomy of the vocal organs, the functions of the various organs of speech, and in subjects bearing generally upon the science of vocal physiology.

Int. 3. Did you, at an early age, begin to make experiments in the artificial production of vocal sounds, or speech, and in the construction of apparatus for that purpose; and if so, what did you do?

Ans. I remember when I was quite a child that my father spoke to me of some automaton speaking machine that he had seen, and aroused so much interest in me that I determined to attempt the construction of such an apparatus. I invented a speaking machine, and constructed it, as a boy, and was able to make it articulate one or two simple words.

Int. 4. When and how did you first become acquainted with Helmholtz's discoveries relating to the quality of vocal sounds?

Ans. While in the city of Elgin in Scotland, I made what I deemed to be the first discovery that the elements of speech were really compound in their nature. My father and I had been struck by the fact that whispered sounds seemed to have a pitch of their own, and we had arranged vowels in musical series. In Elgin I discovered that the position of the vocal organs for any vowel sound yielded a double resonance, and that the resonance tones, proper to the mouth cavities, could be heard mingling with the tones of the voice during the articulation of speech. I made a series of experiments to determine the characteristic tones of the vowels, and communicated the result to Mr. Alexander J. Ellis, of London, who was then, as now, considered an authority in all matters relating to speech. Mr. Ellis replied that my discovery had already been made by Helmholtz, and that Helmholtz had proved the compound nature of speech sounds, by producing such sounds synthetically, by compounding the tones of tuning forks of different pitches, which were kept in continuous vibration by means of an electrical current.

Int. 5. Are the statements contained in Prof. Cross's twentieth to twenty-fourth answers, inclusive, pages 391 and 392 [*printed record in Dowd suit*], a part of the discoveries of Helmholtz, to which you have just alluded?

Ans. They are.

Int. 6. The synthesis of vowel sounds made by Helmholtz was performed by means of an apparatus consisting of a series of tuning forks of different pitches, all of which were kept in vibration by an electro-magnet placed near their prongs, and through the coils of which intermittent currents were passed by a circuit-breaker, so that each tuning fork produced its own tone; and then by means of resonators which could be brought into action at pleasure, Helmholtz intensified these partial tones, more or less, or left some of them inaudible at the distance at which the hearer was placed, and thereby produced the quality of sound of whichever vowel he pleased, as stated in the answers of Mr. Cross just referred to; and this apparatus is shown on pages 176, 178, and 606 of Mr. Ellis's translation of Helmholtz's book. Is it not so? And when, if ever, was this apparatus first described to you?

Ans. It is so. The apparatus was described to me by Mr. Ellis somewhere about the year 1867.

Int. 7. What led you to take an interest in the subject of the production of sound by means of electrical currents?

Ans. I felt that it was my duty as a student of speech to master all the researches of others that bore upon what was to be my professional study, and I therefore desired to witness the results obtained by Helmholtz, and investigate speech for myself in the manner shown by him.

Int. 8. When did you begin to study and experiment upon the production of sound by electricity, and to what extent did you carry your study and experiments before 1870? State generally.

Ans. Immediately after the conversation with Mr. Ellis in 1867, I formed the resolution of reproducing Helmholtz's synthetical experiments, and finding that my knowledge of electricity was insufficient to enable me fully to understand his arrangement, I took up seriously the study of electricity. In the city of Bath, England, I made electrical experiments with a friend, and attempted to set a tuning fork in vibration by an electro-magnet. I do not remember the date of my visit to Bath, but I think it was in the year 1868; but it might have been earlier. From the year 1867 to 1870, I made numerous electrical inventions based upon Helmholtz's vowel apparatus, and before I left England, in 1870, I had made up my mind to pursue one of these inventions to a practical end. The invention to which I allude is now known as harmonic telegraphy or multiple telegraphy.

Int. 9. Did you, at that time, have any ideas as to the practicability of transmission of speech by means of electricity; and if so, to what extent?

Ans. From the moment that I became aware that Helmholtz had been able to produce vowel sounds with the aid of electricity, I believed that the other elements of speech might also be produced in a similar manner. I did not, while in England, form any idea of the details of an apparatus for producing speech in this way, but I did very distinctly have the belief that it was possible to construct such an apparatus. I am sure that I stated to friends in England, before 1870, my belief that we should one day speak by telegraph, but I had no idea that I would ever myself be connected with the realization of such a plan.

Int. 10. When did you and the rest of your father's family come to America to live?

Ans. In August, 1870, we went to Canada, to Brantford, Ontario, where my parents still reside.

Int. 11. When did you first come to Boston, and for what purpose?

Ans. I came to Boston on the 1st of April, 1871, at the invitation of the Boston School Board, for the purpose of carrying on experiments with my father's system of physiological symbols in the Boston School for the Deaf. The object of the experiments was to test the practicability of teaching those who are usually called "deaf and dumb" to use their vocal organs so as to articulate intelligibly.

Int. 12. When did you come to Boston to live permanently?

Ans. On the 1st of October, 1872.

Int. 13. While you were in Canada and Boston, say up to the year 1873 or 1874, how much attention did you pay to the subject

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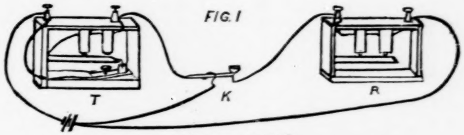
of electricity, and what particular use of electricity did you study and experiment upon?

Ans. From the moment of my arrival in Canada in 1870, up to the commencement of 1874, my mind was full of the scheme for the multiple transmission of telegraphic messages by means of musical tones to which I have already alluded. Up to October, 1872, I resided at my father's house in Canada, paying only occasional visits to the United States, each visit continuing for about two months. I had few facilities for experiment in Canada during that time, and none in the United States. I occupied myself chiefly during my leisure time in studying the subjects of electricity and sound, and in developing theoretically the practical details of my system of harmonic telegraphy. I also made such experiments as I could with the limited facilities at my command, at my father's house in Canada. From October, 1872, up to the commencement of 1874, I devoted all my spare time to practical experiments relating to the production of sounds by electrical means, with the object of reducing to practice the system of harmonic telegraphy. My daytime was completely occupied with professional work, and I carried on my electrical experiments chiefly at night.

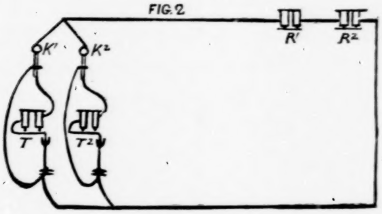
Int. 14. I call your attention to Figs. 1 and 2 in the drawing now shown you: when did you construct and use the apparatus therein shown?

FIG. I



(NOV. 1873)

FIG. 2



(NOV. 1873)

Ans. In November, 1873.

Int. 15. Where?

Ans. In Salem, Mass.

Int. 16. Have you one of the originals of the apparatus there shown? If so, please produce it and state which of those figures it is like.

Ans. I have, and I now produce it. It is a portion of a transmitting instrument like that shown at T, Fig. 1. All the parts are there except the mercury cup and wire to dip into it; one screw cup and a connecting wire also missing.

Int. 17. When and upon what occasion were Figs. 1 and 2, or the figures of which these are lithographic reproductions, drawn by you?

Ans. They were drawn by me some time before the 27th of April, 1876, as part of the illustrations of my preliminary statement in an interference at the Patent Office upon harmonic telegraphy.

Int. 18. State whether you used at that time, in 1873, similar reeds and electro-magnets as receivers, attaching the reed directly to the base or a standard coming from the base instead of using the large box shown in these figures?

Ans. I did, in November, 1873. The receiving instrument usually employed by me at that time consisted of an arrangement almost identical with the instrument now shown. This very instrument was frequently used by me at that time as a receiver, by untwisting the wires which connect the electro-magnet with the steel plate armature and passing the intermittent current from one of the interrupters through the coils of the electro-magnet, without passing through the plate. During the month of November, 1873, I varied the shape and size of the frame holding the receiver so as more conveniently to get at the plate in order to tune it to its proper transmitter. One of my favorite forms of receivers consisted of an arrangement substantially like the model shown, turned upside down, with the bottom of the box (then forming the top) removed, so that the reed was attached to a standard coming from the base. I found this form especially advantageous, as I could remove the plate and substitute others of different lengths and thickness.

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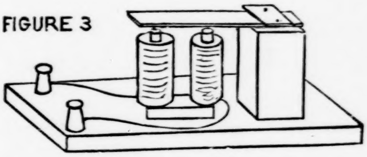
I now make a drawing of my favorite form of receiving instrument in November, 1873.

FIGURE 3



Int. 19. If you ever heard, from a single one of those receivers, tones of different pitches transmitted by transmitters of different pitch, please state when you first did so, describe what you heard, and the circumstances under which you heard it.

Ans. In November, 1873, I arranged two current-interrupters and two harmonic receivers upon a single circuit, as shown in Fig. 2. The details of the instruments will be understood from Fig. 1. The plate armature of the receiver R^1 was intended to have the same normal rate of vibration as that of the interrupter T^1, and the plate armature of R^2 was intended to have the same rate as that of T^2. It was expected that upon depressing the key K^1, the intermittent current from the interrupter T^1 would traverse the circuit in which the receivers R^1 and R^2 were placed, and cause the reed of R^1 to be thrown violently into vibration, so as to produce its musical tone, and that the reed of R^2 would not respond in the same manner. It was also anticipated that upon depressing the key K^2, the reed of R^2 would be thrown violently into vibration, but that that of R^1 would not. And that upon depressing both keys K^1 and K^2 simultaneously, the reeds of both receiving instruments R^1 and R^2 would be thrown violently into vibration, producing musical tones at the receiving station of similar pitch to the tones produced at the transmitting station by the vibration of the interrupters T^1 and T^2. Upon making the experiment, the results were as follows: Upon depressing K^1, the reed of R^1 was thrown violently into vibration, as had been anticipated, producing a musical tone similar in pitch to that produced by T^1, and R^2 was not sensibly affected, save by a slight trembling, which was perceptible to the sense of touch. Upon depressing the key K^2, neither of the reeds R^1 and R^2 was thrown into violent vibration, but both were affected by a slight trembling, which could be felt with the finger. Upon depressing K^1 and K^2 simultaneously, the reed R^1 was thrown into violent vibration, but that of R^2 was not. The results were in accordance with the theory upon which my system of harmonic telegraphy was based, only upon the supposition that the reed of R^2 was not in unison with that of T^2. Upon placing my teeth against the frame to which the reed R^2 was attached and plucking the reed with my finger, I clearly perceived that its pitch was different from that of its proper transmitter T^2. I tried many experiments to tune the reed of R^2, and in the course of these experiments I remodelled the receiving instrument R^2, as shown in Fig. 3, and shifted the position of the reed upon its support, so as to make its free portion longer or shorter, in the attempt to cause its normal rate of vibration to correspond to that of its proper transmitter. I also made the free portion of the reed purposely too short, so that it should have a higher rate of vibration than that of its proper transmitter, and sought to lower its tone by weighting it with lumps of wax. During the course of these experiments, while I happened to have the keys K^1 and K^2 simultaneously depressed, the idea occurred to place my ear against the receiving reed shown in Fig. 3, which was trembling perceptibly to the sense of touch, but which had not been properly adjusted, so as to correspond with its proper transmitter. Upon placing my ear against the reed, I heard two musical tones, the unisons respectively of those produced by T^1 and T^2, seemingly proceeding from that one reed. The reed of R^1, however, was vibrating with great violence in another part of the same room, producing a tone of similar pitch to that produced by T^1, so that I was uncertain whether that tone was produced from the instrument at my ear, or whether it had been mechanically communicated to my ear through the air from the receiver R^1. To test this point, I removed the receiver R^1 from the circuit, leaving R^2, which was then in the condition shown in Fig. 3, in circuit with the two transmitters T^1 and T^2. Upon placing my ear against the receiver R^2, I then clearly perceived two tones proceeding from it, which were similar in pitch to the tones produced by the transmitters T^1 and T^2, and different from that normally produced by the reed of R^2 when plucked by the finger. This experiment was made in Salem, Mass., during the month of November, 1873.

Int. 20. Whether or not, afterward, in the ordinary course of your operations in harmonic telegraphy or with vibrating reed receivers, you availed yourself of this phenomenon of the production in the receiving reed of feeble forced vibrations of the same rate as the rate of the circuit interrupter, but differing in rate from the more ample vibrations which took place when the impulses came with periods corresponding to the normal rate of the receiving reed; and if so, to what extent, and how often, and for what purposes?

[*Question objected to and withdrawn.*]

Int. 20*a*. Did you afterwards in your ordinary operations in the vibrations of reeds, when used as receivers, avail yourself of the phenomenon described in your last answer; and if so, to what extent and for what purpose?

Ans. It was constantly my custom after November, 1873, to observe the feeble forced vibrations produced in the reed of a receiver by the action of a current interrupter of different rate from its own, by placing my ear against the reed. It was my usual method of ascertaining whether to shorten or lengthen the reed of the receiver. When the tone electrically produced was lower in pitch than that produced by plucking the reed by the finger, I lengthened the free portion of the reed, but when the forced vibrations were of higher rate than the free vibrations of the reed, I shortened the vibratory portion of the reed, and thus adjusted its pitch to correspond to that produced by its proper interrupter.

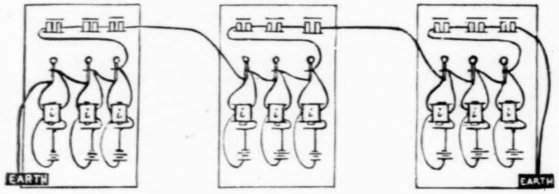
Int. 21. How early did you arrange your multiple telegraph instruments with an induction coil placed between the interrupter and the receiver?

Ans. In the winter of 1873, I think about December.

Int. 22. State whether the drawing now shown you is a correct representation of the manner in which you arranged the apparatus with an induction coil, and state when and for what purpose this drawing, Figs. 4, 5 and 6, was made.

Ans. Figs. 4 and 5 represent correctly the manner in which I arranged the apparatus with induction coils, in December, 1873, and Fig. 6 represents an improvement of the arrangement, devised about the commencement of the year 1874. This drawing, Figs. 4, 5 and 6, was made previously to April 27, 1876, and formed part of the illustrations of my preliminary statement in the harmonic-telegraph interference before referred to.

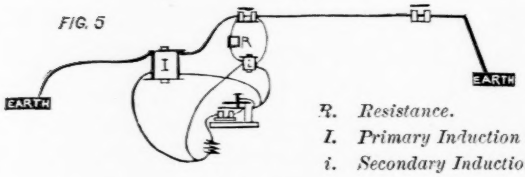
FIG.4 (DECEMBER 1873)



i, i, &c INDUCTION COILS

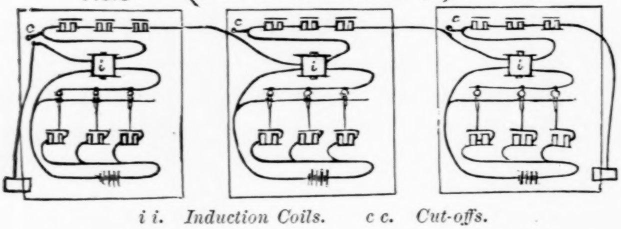
(DECEMBER 1873)

FIG. 5



R. *Resistance.*
I. *Primary Induction Coil.*
i. *Secondary Induction Coil.*

FIG.6 (JANUARY OR FEBRUARY 1874)



i i. *Induction Coils.* *c c.* *Cut-offs.*

Int. 23. When, if ever, did you become familiar with the Scott phonautograph, referred to in Prof. Cross's twenty-eight answer, page 395?

Ans. In the winter of 1873–74.

Int. 24. Did you during that winter construct any phonautographs yourself?

Ans. I did; early in 1874.

Int. 25. In those that you constructed, how was the rod which

LEPHONE COMPANY,-3

carried the style attached to the phonautograph frame, and how was it moved by the membrane?

Ans. One end of the rod was hinged by means of a piece of leather or calico to the edge of the circular frame carrying the membrane. A small piece of cork was fastened to the centre of the membrane and to the rod. Upon uttering a sound in the neighborhood of the membrane it was caused to vibrate, and force the rod to vibrate also. The free end of the rod projected considerably beyond the opposite edge of the membrane, and its vibrations were recorded on smoked glass.

Int. 26. Did you use in your phonautographs a paraboloidal mirror to concentrate the sound waves between the speaker and the membrane; if not, what form did you give to that part of the apparatus which conducted the sound waves from the mouth of the speaker to the membrane?

Ans. I did not use the paraboloidal mirror excepting in experiments with Prof. Cross, at the Institute of Technology, with the instrument he has described in his deposition. In all the phonautographs constructed by myself in the early part of 1874, I used a rubber tube, with a mouthpiece similar to those employed in speaking tubes.

Int. 27. Whether or not during that winter you devised any apparatus for reproducing, by means of phonautograph sound tracings, sounds similar to those which had made the tracings; and if so, describe what it was and how it was to operate.

Ans. I did. A phonautograph tracing was to be drawn on a hollow metallic cylinder, so arranged as to be capable of rotating on a vertical axis. The tracing was then to be cut so as to form a sinuous slit, and air was to be blown through the tracing from a pipe whose nozzle was contracted to a vertical slit. A pencil of air would thus be expelled at the points of intersection, and the rotation of the cylinder would cause this pencil of air to vibrate in the same manner as the air had been moved by the voice of the speaker when the original tracing had been made. I presumed, therefore, that the rotation of the cylinder would cause a sound to be heard similar in quality to that which had produced the tracing.

Int. 28. Did you construct such an apparatus at any time?

Ans. I did not.

Int. 29. Did you, during the year 1874, use any phonautograph of an entirely different character from those which you have described; and if so, what was it?

Ans. I used during the year 1874 a phonautograph which was made from a human ear. The middle ear was exposed by dissection, and a style of hay was attached to the end of the *incus* in place of the *stapes.* Upon uttering sounds into the external ear, I found that the hay attached to the *incus* vibrated sufficiently to enable me to obtain tracings of vocal sounds upon smoked glass.

Int. 30. Did you, during the year 1873 or 1874, devise a receiver in which there was a polarized reed and an electro-magnet? And if so, describe it, and state when you devised it.

Ans. In the winter of 1873-74 I devised a receiver in which the reeds were to be polarized by being attached to the poles of permanent magnets, and they were to be placed opposite the poles of electro-magnets. My method was to attach one reed to each pole of a permanent horseshoe magnet, the free end of each reed projecting over one pole of a horseshoe electro-magnet. Upon this plan, I had one permanent magnet and one electro-magnet for each pair of reeds.

Int. 31. Where did you spend your summer vacation in 1874?

Ans. In Brantford, Ontario, at my father's house.

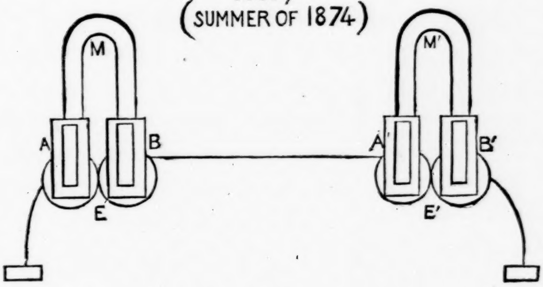
Int. 32. During that summer, did you devise a magneto-electric transmitter to work without a battery? And if so, describe it.

Ans. I did. I saw that the receiver with polarized reeds, which I have just described, could be made to produce electrical currents if the reeds were caused to vibrate mechanically. I therefore devised an arrangement whereby each reed should be enclosed in a bed, so arranged that the reed could be set in vibration by wind in the ordinary manner, as in organ reeds.

Int. 33. Is the arrangement you have just referred to shown in the drawing Fig. 7; and if so, when and for what purpose was the drawing Fig. 7 made?

Ans. Two pairs of reeds, arranged in the manner referred to, are shown in Fig. 7. This drawing was made as part of the preliminary statement above referred to.

FIG. 7
(SUMMER OF 1874)



Int. 34. What characteristics of sound did you then understand that that transmitter would produce from the receiver in the apparatus Fig. 7?

Ans. I understood that the vibration of one of the reeds of the transmitter would not only cause the forcible vibration of the reed of the receiver of similar pitch to itself, but that the amplitude of the vibration of the transmitting reed would control the amplitude of the vibration of the receiving reed, and hence control the loudness of the sound produced from the receiver.

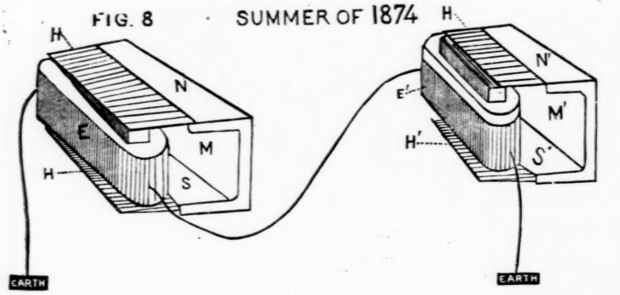
Int. 35. Why and how would the amplitude of the vibration of the transmitting reed control the amplitude of the vibration of the receiving reed?

Ans. I understood from the well-known laws of magneto-electricity that a current of electricity would be induced in the coils of the electro-magnet E, Fig. 7, when any one of the transmitting reeds A moved downwards or upwards, and that the strength of the current would be proportional to the velocity of the motion of the reed. I therefore inferred that as the velocity of motion of the reed was increased when the amplitude of its vibration was increased, that the strength of the current produced by the vibration was also increased. In considering the effect upon the corresponding reed A′ of the receiver, it was evident that the violence of its vibration depended upon the strength of the electrical impulses passed through the coils of the electro-magnet E. I therefore reasoned that the more violent the vibration of any transmitting reed, the more violent would be the vibration of the corresponding receiving reed, and the less violent the vibration of the one, the less violent the vibration of the other.

Int. 36. In the apparatus with polarized reeds which you have been describing, you appear to have had one horseshoe permanent magnet and one horseshoe electro-magnet for each pair of reeds: did you during the same summer of 1874 devise any plan for reducing the number of magnets employed; and if so, what apparatus did you devise for that purpose? Please illustrate your answer by a diagram of it.

Ans. I did.

FIG. 8 SUMMER OF 1874



In the apparatus shown in Fig. 8, which is one of the illustrations to the preliminary statement referred to before, all the reeds were to be attached to the poles of a single horseshoe magnet, and a single elongated straight bar electro-magnet was to be employed. This arrangement was devised during my summer vacation in 1874.

Int. 37. If during that summer you had any ideas concerning the transmission of articulate speech by electricity, state by what kind of an apparatus you thought to do it and how you expected to operate such an apparatus.

Ans. I was at that time acquainted with Helmholtz's theories and experiments, and believed that any of the sounds of speech could be produced by producing the musical tones of which such sounds were known to be composed, with their proper relative intensities. I was also familiar with the well-known experiment of articulating to an undamped piano. I had frequently pronounced vowel sounds in the neighborhood of an undamped piano, and had observed that an approximation to the vowel uttered was produced by the vibration of the strings of the piano after my voice has ceased. I knew that those strings of the piano which corresponded in pitch to the fundamental and upper partials or overtones of the vowel uttered had been set sympathetically into vibration with amplitudes corresponding to the loudness of the component tones, and that they continued vibrating with the proper relations of force for a perceptible time after the voice had ceased, as evidenced by the reproduction from the piano of the quality of the sound which had been uttered into it. I therefore conceived that a similar apparatus to that shown in Fig. 8 could be operated by the voice of a speaker, and that a sound would be produced by the receiving apparatus shown in Fig. 8, similar in quality to that which had operated the transmitting apparatus. For those reeds or springs of the transmitting telephone H, Fig. 8, which corresponded in pitch to the fundamental and upper partials of any sound uttered in their neighborhood would, like the strings of the piano, be thrown sympathetically into vibration, the amplitude of the vibration of the different reeds corresponding to the loudness of the corresponding partial tones. And the reeds of the receiving telephone H′, corresponding in pitch to the fundamental and upper partials of the sound uttered at the transmitting end, would be thrown into vibration with corresponding relations of force, and a sound would be produced from the receiving instrument H′ of similar composition to that uttered at the transmitting end. Hence the quality of the original sound would be reproduced. I therefore conceived if the reeds or rods of the instruments shown in Fig. 8 were made very numerous, and the differences of pitch between adjoining reeds very slight, that a person might speak in the neighborhood of one of the instruments shown in Fig. 8, and his articulation be reproduced by the other instrument; and that thus vocal utterance could be electrically transmitted.

Int. 38. Did you ever build such an apparatus as Fig. 8; and if not, why not?

Ans. I did not, because of the great number of reeds that would be required, and because I saw that the instrument could be very much simplified.

Int. 39. Did you at any time during that summer conceive of any plan by which you could materially reduce the number of reeds required in such an apparatus for the transmission of speech? and if so, what was your conception, and what modification, if any, did you expect to make in the arrangements for vibrating the transmitting reeds which you did retain?

[*Objected to as incompetent.*]

Ans. In considering the action of the apparatus shown in Fig. 8, I saw, however numerous might be the reeds which were set in vibration by the voice of a speaker, that as there was only one electro-magnet, an effect would be produced in that magnet which would be a resultant of the vibration of the reeds; and I saw that this resultant effect might be produced in the electro-magnet by a single reed vibrated in such a manner as to represent the resultant of all the vibrations. I conceived that a single reed could be moved by the voice of a speaker in this manner by attaching it to a stretched membrane, and speaking against the membrane.

Int. 40. What experience had you had in vibrating, by means of the human voice, membranes which were so loaded or arranged that some work had to be done by the sound waves besides moving the membrane itself?

Ans. I had made many experiments with phonautographs in which membranes operated by the human voice had not only moved levers of considerable length, at a mechanical disadvantage, but had caused such levers to perform considerable mechanical work in scraping lampblack from glass slides so as to form enlarged tracings of the aerial vibration. I was also familiar with Koenig's Manometric Flame Apparatus, the membrane of which was caused by the voice to vibrate against the pressure of gas admitted into the capsule from the ordinary gas pipes, so as to create a sensible vibration in the flame at the orifice of a capillary tube. At the very time also when this conception occurred to me, I was obtaining tracings of the vibrations of the bones of a human ear, and I reasoned that the disproportion in mass between the tympanic membrane and the bones that were moved by it was much greater than that existing between a membrane like that used in the phonautograph and the reed which I proposed to operate by it.

[*Adjourned to July* 9, 1879, *at* 11 *A. M.*]

BOSTON, July 9, 1879.

Int. 41. What is the size of the membrane of the human ear?

Ans. The specimen used by me was about the size of a silver half-dime.

Int. 42. Did you, at that time, construct the apparatus described in your fortieth answer?

Ans. I did not.

Int. 43. Why not?

Ans. Because I had the idea that the magneto-electric currents produced by the operation of the voice would be too feeble to produce practically useful results.

Int. 44. Did you, during that summer and while in Canada, describe to any one that apparatus and communicate to them your idea as to the transmission of articulate speech by it; and if so, to whom?

Ans. I did. I had many conversations on the subject with my father, and I believe with friends, and I distinctly recollect making drawings of the harp arrangement to illustrate the subject to some person or other at my father's house in Canada, during the summer of 1874; and I remember directing some person's attention to the human ear, with which I was experimenting, as a proof of the correctness of my membrane idea. I also have some recollection of having a discussion regarding the membrane idea, and directing attention to the massive nature of the bones of the ear when compared to the tympanic membrane. I cannot remember these discussions with any detail, but simply remember holding this human ear in my hand and directing attention to it, as an illustration of some theory I was discussing concerning the reproduction of speech by electrical means.

Int. 45. When did you return to Boston after your vacation in that summer of 1874?

Ans. About the end of September or the first of October.

Int. 46. Did you, after your return to Boston, describe to any one in Boston your harp arrangement or your plan for the transmission of articulate speech; and if so, to whom, when and where?

Ans. I did. I described my method for the transmission of articulate speech to Dr. Clarence J. Blake, at his office in the Hotel Berkeley, a few days after the 21st of October, 1874. I also described this method to Mr. Moses G. Farmer, to Prof. Lovering, and to one of the professors of the Institute of Technology, during the latter part of 1874. I also spoke of it to Mr. Thomas Sanders, in Salem, Mass., and to Mr. Gardiner G. Hubbard, in Cambridge, during October, 1874.

Int. 47. Did you at Dr. Blake's, upon the occasion referred to in your last answer, make any sketches to illustrate your description of your inventions; if so, will you please produce them?

Ans. I did, and I now produce them.

Int. 48. One of these sheets, which is marked "Nor 7," contains figures on both sides: please to state what the figures on the first side represent.

Ans. The larger figure on that side, which for convenience I will call Fig. 1, though the figures are not numbered in this drawing, refers to my apparatus for inducing currents of electricity by the vibration of polarized reeds, arranged like organ reeds, to be blown by wind, and is the same arrangement shown before in Fig. 7, and referred to in my thirty-third answer. The other figure on that side, which I shall call Fig. 2, represents an arrangement for increasing the effect produced by the vibration of the reeds. I had the idea that magneto-electric currents generated by the vibration of a polarized tongue were very feeble, and therefore sought to increase the effect by combining together three permanent horseshoe magnets, as illustrated in this figure. Two of these permanent magnets, the poles of which are marked respectively N, S, N, S, are represented as covered with coils of insulated wire, and between the poles of the opposite magnets are shown in section the ends of the polarized reeds illustrated in plan in Fig. 1 of that side.

Int. 49. What do the drawings on the other side of this sheet represent?

Ans. One of them, which I will call Fig. 3, represents a galvanometer in circuit with a straight bar electro-magnet, over the pole of which a polarized or magnetical tongue is placed. This drawing was made for the purpose of explaining to Dr. Blake the peculiarities of the electrical current produced by the vibration of a magnet in front of an electro-magnet. The other illustration, which I shall term Fig. 4, represents the first apparatus I had conceived for the transmission of vocal utterance electrically. This is the same harp instrument shown before in Fig. 8 and referred to in my thirty-sixth answer.

[*Complainants put in the sheet referred to in the last two answers, and it is marked " Complainants' Exhibit 30,* Dr. C. J. Blake Drawings, W. P. Preble, Jr., Examiner," and the figures on it are numbered by the examiner as mentioned by the witness.*]

Int. 50. Did you have any conversation on that occasion with Dr. Blake as to whether the human voice could vibrate the membrane with attached armature; and if so, state what, and whether any drawings were made by either of you to illustrate that topic.

Ans. I have a recollection of asking Dr. Blake's opinion on this point, and the impression that I got from his remarks was that it could if the membrane were made concave, like that in the human ear, and if the end of the armature were attached, not to the centre of the membrane, but to a point a little to one side, corresponding to the point of attachment of the malleus and tympanic membrane of the ear. I do not recollect whether any drawing was made of this idea at that time, but I remember our discussing the operation of the harp arrangement, marked " Fig. 4 " in Exhibit 30, and comparing the apparatus to the organ of Corti in the human ear I remember also that Dr. Blake suggested that a damping arrangement would have to be attached to the harp arrangement, and that he made a drawing of the manner in which the rods of Corti were damped in the ear.

Int. 51. You say that this first conversation on this subject with Dr. Blake was soon after the 21st of October, 1874: how do you fix that date?

Ans. By reference to a letter that I received from him, dated Oct. 21, 1874, in which he referred to some letter that he had received from Mr. Elisha Gray concerning experiments in telegraphing "vocal" sounds. [I visited Dr. Blake within a day or two after receiving his letter, and told him that I did not wish to see Elisha Gray's letter, as I was then engaged upon the problem of the transmission of articulate speech by electricity, and did not wish to be indebted to any one for information upon the subject.] I then explained to him my method and made the drawings that have been put in evidence, and made other drawings illustrating my system of harmonic telegraphy, for which I was then applying for protection in the Patent Office. I know that all these drawings were made within a few days after receiving Dr. Blake's letter referred to.

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* The exhibits have been renumbered for the pending case of American Bell Telephone Company *v.* People's Telephone Company, and the number of said exhibit in said pending case is No. 18.

[*Passage in brackets objected to as incompetent.*]

Int. 52. When did Mr. Sanders and Mr. Hubbard become interested in your inventions for multiple telegraphy?

Ans. In the autumn of 1874, shortly after my return from Canada.

Int. 53. Did you have some conversations with Prof. Henry at the Smithsonian Institute in Washington, in February or March, 1875, upon the subject of your electrical inventions?

Ans. I had.

Int. 54. Did you at or about the time of that conversation make any memorandum of it; and if so, in what form and for what purpose did you write down the substance of it?

Ans. I did. I wrote an account of my conversation with Prof. Henry in the form of a letter for the information of my parents in Canada.

Int. 55. Was that letter sent to your parents at the time it was written?

Ans. It was.

Int. 56. Whether or not the statements contained in that letter as to your conversations with Prof. Henry are correct?

Ans. They are.

Int. 57. Will you please produce that letter, and read from it as part of your answer what relates to those conversations, omitting the personal and family matters?

[*Objected to as incompetent.*]

Ans. I produce it, and read from it the following: —

"292 ESSEX STREET, SALEM, March 18, 1875.

"*Dear Papa and Mamma:*

"I have just returned from my trip to New York, thoroughly worn out. Found your letters of the 14th inst. awaiting me. I am now beginning to realize the cares and anxieties of being an inventor. In order to complete the apparatus as thoroughly as possible, I have decided to give up all professional work for some weeks. I have put off all pupils and classes until the 12th of April. Flesh and blood could not stand much longer such a strain as I have had upon me. Professional work is all in confusion, and the only way is to cut the Gordian knot and throw up everything till the end is achieved. I long to write full accounts to you, and I have delayed writing in order to give a connected narrative of the whole. You seem to think that my anxieties are over, when in truth they are really only beginning.

"Before entering upon explanations, let me ask you first to hunt over all my old letters that you have preserved for everything bearing on the Telegraph. Forward to me at once as evidence. I must take action at once in regard to foreign patents. Will you or uncle help me in this?

"What I would like is this. I have written to my lawyers in Washington to make application for foreign patents on my own responsibility.

"Should I prove unable to pay for these applications at once, will you help me? While these applications are being got out I shall write to the Herdmans, offering them a share if they will take the pecuniary burden of any interference, etc., that may arise abroad from Mr. Gray. Should they decline, — which I should think unlikely, — I should of course relinquish a foreign contest. . . .

"Whenever I am free to dispose of my interest in the invention I shall do so, and then you may expect to see Visible Speech go ahead. I can then take up the electro-motor, which I think as valuable an idea as this telegraph.

" . . . Now, to resume telegraphy. When I was in Washington I had a letter of introduction to Prof. Henry, who is the Tyndall of America. I had found on inquiry at the Institute of Technology that some of the points I had discovered in relation to the application of acoustics to telegraphy had been previously discovered by him. I thought I would, therefore, explain all the experiments, and ascertain what was new and what was old. He listened with an unmoved countenance, but with evident interest, to all; but when I related an experiment that at first sight seems unimportant, I was startled at the sudden interest manifested.

"I told him that on passing an intermittent current of electricity through an empty helix of insulated copper wire, a noise could be heard proceeding from the coil, similar to that heard from the telephone. He started up, said, 'Is that so? Will you allow me, Mr. Bell, to repeat your experiments, and publish them to the world through the Smithsonian Institute, of course giving you the credit of the discoveries?'

"I said it would give me extreme pleasure, and added that I had apparatus in Washington, and could show him the experiments myself at any time. He asked if I could do it *then*, if he went with me, and I told him that I had everything in readiness at Mr. Hubbard's house. He said, 'I will go with you now. Have you a carriage here?' I had not, and so he put on his coat and was about to order his carriage, when I offered to save him the trouble of going out on such a raw, damp day, by bringing the apparatus to the Smithsonian Institute. (He was suffering from a cold, and besides is very aged, — I believe about eighty years old.)

"We appointed noon next day for the experiment. I set the instrument working, and he sat at a table for a long time with the empty coil of wire against his ear, listening to the sound. I felt so much encouraged by his interest that I determined to ask his advice about the apparatus I have designed for the transmission of the human voice by telegraph. I explained the idea and said, 'What would you advise me to do: publish it and let others work it out, or attempt to solve the problem myself?' He said he thought it was the germ of a great invention, and advised me to work at it myself instead of publishing. I said that I recognized the fact that there were mechanical difficulties in the way that rendered the plan impracticable at the present time. I added that I felt that I had not the electrical knowledge necessary to overcome the difficulties. His laconic answer was, 'GET IT.'

"I cannot tell you how much these two words have encouraged me. I live too much in an atmosphere of discouragement for scientific pursuits. Good ——— is unfortunately one of the *cui bono* people, and is too much in the habit of looking at the dark side of things. Such a chimerical idea as telegraphing *vocal sounds* would indeed to *most minds* seem scarcely feasible enough to spend time in working over. I believe, however, that it is feasible, and that I have got the cue to the solution of the problem.

"Prof. Henry seemed to be much interested in what I told him, and cross-questioned me about my past life, and specially wanted to know where I had studied physics. . . .

"Having left Prof. Henry and Washington, I proceeded to New York, where I saw Mr. Orton, and Mr. Prescott the electrician. Arrangements are made for me to bring my instruments to New York and experiment on a real line wire.

"I left Boston last Sunday and called at the office of the Western Union on Monday. Mr. Orton and Mr. Prescott both devoted a large portion of their time in discussing with me the whole plan from its theoretical point of view. Mr. Smith, the manager of the experimental room, was absent from town, but was telegraphed for. He replied that he could not come till next morning. Tuesday forenoon we had batteries connected, and I tuned up my instruments. They went like clockwork. I have come to the conclusion that by a happy chance they are much more perfect than I thought at first. The signals are as clear, sharp and rapid as with the ordinary Morse sounder. I connected two transmitters and two receivers on only one line, and two messages were sent simultaneously.

"We had 100 cells of a battery, and all went well on our artificial circuit. Mr. Prescott then said he would like to see them tried on a real line wire. He telegraphed to Philadelphia to have two wires crossed there so as to give us (practically) a continuous wire from New York to Philadelphia and back. The electro-magnets I employed were not intended for trial on a long line. They were wound with coarse wire and the 'resistance' was only '3 ohms.' Ordinary electro-magnets for actual service on a line have a resistance of about

200 to 600 ohms. None of us, therefore, expected the instruments to work without stronger magnets. But they *did work.* The signals, though feeble, came sharply and concisely through the 200 miles of line wire !!! I suggested trying stronger magnets, so Mr. Prescott ordered the instruments to be taken to the workshop and stronger magnets placed on them. They were to be ready in the afternoon, so I went out to dinner and returned in a couple of hours.

"Rest will form subject for next letter.

"With fond love,
"Your ever affectionate son,
"ALECK.

"PROF. A. M. BELL,
Brantford, Ontario."

[*The original letter is marked for identification by the examiner, with his initials and the date, July* 9, 1879, *on each of the five leaves.*]

Int. 58. What do you mean by the phrase "visible speech" in that letter?

Ans. "Visible speech" is the name of my father's system of physiological symbols, which I was using as a means of teaching articulation to the deaf, and has no reference to electricity or telegraphy.

Int. 59. The letter refers to an interference with Mr. Gray: were you then in interference with him at the Patent Office; and if so, upon what subject?

Ans. I was then in interference with Mr. Elisha Gray upon the subject of harmonic multiple telegraphy.

Int. 60. The letter refers to an exhibition which you made in the presence of Mr. Orton and Mr. Prescott, of the Western Union Telegraph Company: what kind of apparatus or system was the subject of that exhibition?

Ans. The experiment was made to illustrate my method of multiple transmission of telegraphic messages.

Int. 61. Whether or not you occupied yourself in studying and experimenting upon your electrical inventions during the spring and summer of 1875?

Ans. I did.

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Int. 62. Did you, at the time of its date, May 4, 1875, write and send to Mr. Gardiner G. Hubbard a letter which is now shown you, and which was referred to and identified in the deposition of Mr. Hubbard on pages 431* and 440 of the record?

Ans. I did.

Int. 63. Please to read from it, as part of your answer, that part of it which begins at the top of the third page, and from thence to the end.

[*Objected to as incompetent.*]

Ans. I do so. It is as follows: —

"SALEM, MASS., May 4, 1875.

"*Dear Mr. Hubbard:*

" . . . Letter received from Mr. Pope, with directions for preparing paper. Letter received from Prof. Henry of the Smithsonian Institute, in answer to one I wrote him some time ago telling him of recent experiments undertaken in order to determine the cause of the sound heard from the empty helix of wire.

"The deduction I had made from the experiments was that an intermittent current of electricity creates a molecular vibration in the conductor through which it is passed. Prof. Henry writes that he believes that my experiments are new, and that my explanation of the cause of the sound is in his opinion correct.

"An experiment which I have long desired to make is at last within my reach. My friend, Don Manuel Fenollosa, whose music rooms are next door to this house, is to allow me to experiment with his pianos. I shall carry a wire from my study into his room to-morrow, and try the effect of passing an intermittent current through the strings of a piano. Unless I am greatly mistaken, the string, whose rate of movement coincides with the molecular vibration induced in the wires by one of my transmitters, will resound loudly.

"Another experiment has occurred to me which, if successful, will pave the way for still greater results than any yet obtained. The strings of a musical instrument in vibrating undergo great changes of *molecular tension*. In fact, the vibration represents the struggle between the tension of the string and the moving force impressed upon it. I have read somewhere that the resistance offered by a wire to the passage of an electrical current is affected by the *tension of the wire*. If this is so, a *continuous current of electricity* passed through a vibrating wire should meet with a varying resistance, and hence a pulsatory action should be induced in the current. If this turns out to be the case, the oscillations of the current should correspond in *amplitude*, as well as in the rate of movement, to the vibrations of the string. One consequence would be that the *timbre* of a sound could be transmitted. The plan for transmitting *timbre* that I explained to you before — viz., causing permanent magnets to *vibrate* in front of electro-magnets — is chiefly defective on account of the feebleness of the induced currents. If the other plan is successful, the strength of the current can be increased *ad libitum*, without destroying the *relative intensities of the vibrations*.

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* These references are to the pages of the printed record in the suit *Bell Telephone Company* v. *Dowd.*

"Yours respectfully,

"A. GRAHAM BELL.

"GARDINER G. HUBBARD, Esq.,
Cambridge, Mass."

Int. 64. In the letter of May 4, you speak of certain experiments which you propose to try, one of which you supposed would cause pulsations or oscillations in the electrical current by means of varying the resistance of its conductors, and you say that one consequence would be that the *timbre* of a sound could be transmitted: how did you expect that this variation of resistance would reproduce the *timbre* of a sound?

Ans. The experiment referred to was tried a day or two after the 4th of May. I expected that an instrument constructed with a large number of wires, arranged as in a piano, could replace the transmitting harp arrangement shown in Fig. 8, and referred to in my thirty-sixth answer. I had the idea that magneto-electric currents, generated in the way shown in Fig. 8, would be too feeble for practical purposes, and conceived that a more powerful and similar effect could be produced by keeping the electro-motive force of my circuit constant, and interposing a varying resistance. I thought that upon speaking to a harp arrangement of stretched wires, through which a continuous current of electricity was passed, that the strings corresponding in pitch to the musical constituents of the sound uttered would be thrown sympathetically into vibration, and that the amplitude of the vibration of each string would correspond to the loudness of the corresponding partial tone of the sound uttered, and that the battery current would meet with a varying resistance on account of the varying tension of the wires through which the current was passed, and that the variations in the strength of the current thus produced would cause the vibration of those reeds of the receiving-harp arrangement, shown in Fig. 8, which corresponded to the stretched strings which were vibrated by the voice; and that the amplitude of the vibration of each reed would be dependent upon the amplitude of the vibration of the corresponding stretched string, and that thus the quality of the sound produced from the receiving-reed arrangement would be similar to the quality or *timbre* of the sound uttered in the neighborhood of the stretched-string harp arrangement. I also thought that it might be possible to dispense altogether with the reed arrangement shown in Fig. 8, and that a stretched-string harp arrangement might be used as a receiver; for I believed at the time this letter was written that the passage of a varying current through a conducting wire occasioned a molecular vibration in that conductor, and I therefore thought that the varying current from a stretched-string harp transmitter would, when passed through the strings of another similar apparatus, occasion a molecular vibration in those strings, and that the strings of the receiver which were in unison with the vibrating strings of the transmitter would be thrown into sympathetic vibration by the molecular changes, and that the amplitude of the vibration of each of those strings would be dependent upon the amplitude of the vibration of the corresponding strings of the transmitter, and that thus a sound would be produced from the receiver of similar quality or *timbre* to that which occasioned the vibration of the wires of the transmitter. I further thought that a single wire could be used in place of the single reed of my membrane arrangement. My idea was to stretch a wire parallel to the surface of my stretched membrane, and to attach the centre of the membrane to the wire. I presumed that upon speaking to the membrane, the wire would be forced into vibration, and that the changes of tension would produce an effect upon the continuous current passed through the wire similar to the resultant effect produced by the stretched-string harp transmitter, and that the quality or *timbre* of the sound uttered against the membrane could be produced from a reed membrane receiver, or from a stretched-wire receiver similar to the transmitter employed. I was quite familiar with the fact that the elements of speech differ from one another in *timbre;* and when I speak in this letter of my "plan for transmitting *timbre*," I mean my method of transmitting articulate speech.

Int. 65. What advantage is it in a system of multiple harmonic telegraphy to transmit quality as well as pitch of sound?

Ans. No advantage whatever.

Int. 66. This letter of May 4, 1875, speaks of having received a letter from Mr. Pope about some prepared paper. Was that Mr. Frank L. Pope, the electrician of the Western Union Telegraph Company, and what did you want prepared paper for at that time?

Ans. I believe that was Mr. Frank L. Pope, electrician of the Western Union Telegraph Company. I wanted to obtain chemically prepared paper for use in my system of autographic telegraphy, for which I obtained Letters Patent of the United States in April 6, 1875.

Int. 67. Please look at the letter now shown you, dated May 24, 1875. State whether you wrote it and sent it to your father at the time of its date; and if so, read it as part of your answer.

[*Objected to as incompetent.*]

Ans. I did, and I now read it.

"SALEM, MASS., May 24, 1875.

"*Dear Papa and Mamma:*

"I am so immersed in telegraphy and science that I find it impossible to write freely about anything else; but I feel that at the present time you can scarcely be inclined to listen to anything I have to say on such subjects.

"Since I gave up professional work and devoted myself exclusively to telegraphy, I have been steadily gaining health and strength,

EPHONE COMPANY,-3

and am now in a fit state to encounter Mr. Gray or any one else. The patents that have been granted to me without opposition are, —

"1st. The principle of converting a vibratory motion into a permanent make or break of a local circuit.

"2d. The special form of 'vibratory circuit breaker' put in illustration.

"3d. The autograph telegraph.

"The autograph arrangement is rapidly approaching completion. Already I can copy handwriting *quite legibly*, though not yet neatly. The rate of transmission by means of my instrument will be exactly ten times more rapid than 'Bakewell's Autograph Telegraph,' in which the rate is 300 letters per minute. When 3,000 letters per minute can be sent, my telegraph will be the most rapid as well as the cheapest.

"Every moment of my time is devoted to study of electricity and to experiments. The subject broadens. I think that the transmission of the human voice is much more nearly at hand than I had supposed. However, this is kept in the background just now, as every effort is to be made to complete the autograph arrangement, so as to have it used on some line.

"The two patents for the transmission of musical notes are not decided yet. I can't understand why the interference should not have been declared before this. Here are some late discoveries: 1. The current from one of my instruments passed through an iron wire causes a musical note to issue from the wire. 2. The same effect is produced by passing the current through a piece of carbon. 3. Ditto when it is forced through the plumbago of an ordinary lead pencil ! ! ! No similar effects noted yet with copper, brass, or mercury.

"A still more curious phenomenon is the following: —

"Two thin strips of brass (A and B) are connected with the wires coming from my transmitting instrument, T, and from the battery. On holding A to my ear I hear nothing, but the moment that I touch B with my finger a musical note is heard to proceed from A ! !

"Truly, the more I study electricity and magnetism the more I feel the truth of Hamlet's saying, 'There are more things,' etc.

"I fear that this telegraphic business may force me to remain the membrane to the wire. I presumed that upon speaking to the membrane, the wire would be forced into vibration, and that the changes of tension would produce an effect upon the continuous current passed through the wire similar to the resultant effect produced by the stretched-string harp transmitter, and that the quality or *timbre* of the sound uttered against the membrane could be produced from a reed membrane receiver, or from a stretched-wire receiver similar to the transmitter employed. I was quite familiar with the fact that the elements of speech differ from one another in *timbre;* and when I speak in this letter of my "plan for transmitting *timbre*," I mean my method of transmitting articulate speech.

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[*Objected to as incompetent.*]

Ans. I did, and I now read it.

"SALEM, MASS., May 24, 1875.

"*Dear Papa and Mamma:*

"I am so immersed in telegraphy and science that I find it impossible to write freely about anything else; but I feel that at the present time you can scarcely be inclined to listen to anything I have to say on such subjects.

"Since I gave up professional work and devoted myself exclusively to telegraphy, I have been steadily gaining health and strength,

EPHONE COMPANY,-3

and am now in a fit state to encounter Mr. Gray or any one else. The patents that have been granted to me without opposition are, —

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"2d. The special form of 'vibratory circuit breaker' put in illustration.

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"The two patents for the transmission of musical notes are not decided yet. I can't understand why the interference should not have been declared before this. Here are some late discoveries: 1. The current from one of my instruments passed through an iron wire causes a musical note to issue from the wire. 2. The same effect is produced by passing the current through a piece of carbon. 3. Ditto when it is forced through the plumbago of an ordinary lead pencil! ! ! No similar effects noted yet with copper, brass, or mercury.

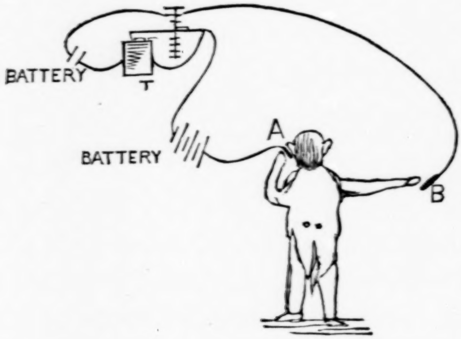
"A still more curious phenomenon is the following: —

"Two thin strips of brass (A and B) are connected with the wires coming from my transmitting instrument, T, and from the battery. On holding A to my ear I hear nothing, but the moment that I touch B with my finger a musical note is heard to proceed from A!!

"Truly, the more I study electricity and magnetism the more I feel the truth of Hamlet's saying, 'There are more things,' etc.

"I fear that this telegraphic business may force me to remain the

AMERICAN BELL TELEPHO



greater portion of the summer here, but I cannot tell yet, so many details have to be worked out. My inexperience in such matters is a great drawback. However, Morse conquered his electrical difficulties although he was only a painter, and I don't intend to give in either till all is completed.

" With dear love,

" Your affectionate son,

" ALECK."

[*The original is marked by the examiner with his initials and the date July* 9, 1879, *for identification.*]

Int. 68. Did you try at Mr. Fenollosa's rooms the experiment proposed in your letter to Mr. Hubbard of May 4; and if so, with what results?

Ans. I tried the experiments proposed within a day or two of the letter to Mr. Hubbard. I first passed an intermittent current from a current interrupter through that string of a piano which seemed to be in unison with the interrupter, and observed whether the string was thrown into sympathetic vibration. It was not. I then listened very closely to the piano, for the purpose of ascertaining whether any noise proceeded from the wire. I heard the pitch of the interrupter, but whether the sound was transmitted through the air from the adjoining house, or proceeded from the string in question, I was not able to satisfy myself. A continuous current was then passed through one of the wires of the piano, and through the coils of an electro-magnet in the adjoining house. Over the pole of that electro-magnet projected the free end of a steel reed which was tuned to the pitch of the string. The string of the piano was then set in vibration by depressing the proper key of the piano, and the effect upon the reed noted. The reed was not thrown sympathetically into vibration. Upon placing my ear against the steel reed, I could hear very faintly the tone of the string, but I was unable to satisfy myself whether the sound I heard was electrically produced, or had been transmitted mechanically to my ear. The piano was in an adjoining house, and the sound was faintly audible in the room where I tried the experiment.

Int. 69. Have you since that day ever tried to work a telephonic receiver by vibrating a stretched wire through which a continuous current of electricity was passing on to the main line in the manner proposed in your letter of May 4? And if so, describe such experiment with its results, and state when you made it.

Ans. I have made the experiment, but I cannot at the present moment fix the exact date. My impression is it was during the month of February of the present year; at any rate, it was during this present year. I passed a continuous current through a fine stretched iron or steel wire which was placed in one of the rooms in Mr. Williams's building, 109 Court Street. The circuit was continued into another room, and the current passed through the coils of an ordinary hand telephone. While I listened at the telephone, Mr. Edward Wilson kept plucking the stretched wire. I heard distinctly from the telephone a musical tone each time the wire was plucked, and recognized, moreover, the peculiar quality or *timbre* of the wire. I satisfied myself, by short-circuiting the telephone and by breaking the circuit, that the sound I heard had been electrically produced.

Int. 70. Please look at the letter now shown you, dated June 2, 1875, which is one of those identified in the deposition of Mr. Hubbard, pages 431* and 440. State whether you wrote it and sent it to Mr. Hubbard at the time of its date; and if so, read it as a part of your answer.

[*Objected to as incompetent*]

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* These references are to pages of the printed record in the suit *Bell Telephone Company* v. *Dowd.*

Ans. I did, and I now read it: —

"SALEM, MASS., June 2, 1875.

"*Dear Mr. Hubbard:*

"I have accidentally made a discovery of the very greatest importance in regard to the transmitting instruments. Indeed, so important does it seem to me that I have written to the organ factory to delay the completion of the reed arrangement until I have had the opportunity of consulting you.

"I have succeeded to-day in transmitting signals *without any battery whatever!*

"The musical note produced at the receiving end was sensibly the equivalent of that at the transmitting end in *loudness* as well as pitch.

"I shall call upon you to-morrow (Wednesday) evening, as there are several matters I wish to talk over with you.

"In haste,
"Yours respectfully,
"A. GRAHAM BELL.

"GARDINER G. HUBBARD, Esq.,
Brattle Street, Cambridge."

Int. 71. Did you, on the 2d of June, 1875, perform the experiment stated in that letter? And if so, state where, and describe the experiment fully.

Ans. I did. The experiment was made in the upper part of Mr. Williams's building, No. 109 Court Street, in two small rooms that Mr. Williams had allowed me to use for experimental purposes. I was carrying on a series of experiments for the purpose of perfecting for practical use my system of autograph telegraphy, which was a development of my harmonic telegraph. I had arranged three experimental stations upon a single line wire, which for convenience of reference I shall designate A, B and C. At station A were arranged a number of current interrupters, whose rates of vibration were different, and a number of telegraph keys corresponding to the interrupters. By the depression of any key, the intermittent current from the corresponding interrupter was directed on to the line wire to the stations B and C. At each station, B and C,

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were placed harmonic receivers corresponding in pitch to the interrupters at station A. Each receiver consisted of a horseshoe electro-magnet, to one pole of which was clamped one end of a steel reed, the free end of which projected over the other pole of the magnet. A coil of insulated wire surrounded that leg of the magnet which was presented to the free end of the reed. Stations A and B were in one room, and station C in the adjoining room. I took charge of stations A and B during the experiment referred to, and Mr. Thomas A. Watson took charge of station C. We were making an experiment to ascertain whether the receiving reeds were properly tuned to their corresponding interrupters, and whether the operation of one interrupter interfered with that of the others when the keys were simultaneously depressed. I pressed down one key at station A and observed whether the proper reed at station B was thrown into forcible vibration, and Mr. Watson observed whether the proper reed of station C was similarly affected. Upon trying all the keys in succession it was found that one of the receivers at station C failed to respond. As we very often found that the magnets of the receivers were so closely adjusted to the reeds that the reeds would stick to the pole when a powerful current was passed, I thought that this might be the cause of the failure in the present case. I therefore called out to Mr. Watson to pluck the reed with his finger. He did so, and I imagined that the corresponding reed of station B was thrown momentarily into vibration. I was struck by this, as I had not depressed the key of the corresponding interrupter, and could not see where the current came from to operate that receiver. I therefore requested Mr. Watson to pluck the reed at station C a number of times, and found that I had not been mistaken in my observation. To test the matter still further I removed station A from the circuit altogether, and connected the receivers of B and C upon a closed circuit without any battery. Upon plucking with the finger any reed of station C, it was found that the corresponding reed of station B was thrown into sympathetical vibration, and *vice versa*. I then requested Mr. Watson to pluck one of the reeds of station C a number of times, while I placed my ear against all the reeds of station B in succession; I could hear from each reed the peculiar tone of the reed plucked at station C, and recognized that the *timbre* of the plucked reed had been reproduced. We then placed a single receiver at station C in circuit with a single receiver at station B, and repeated the experiments. The results were much more marked. Upon plucking the reed at station C, its sound was reproduced by that at station B; and upon plucking the reed at station B, its sound was reproduced by that at station C. When the two reeds employed were in unison with one another, the plucking of one resulted in the visible vibration of the other, the amplitude of vibration often being considerable. No battery was used. Upon placing a battery in the circuit, the same effects were observed and the results were more marked.

[*Adjourned to July* 10, 1879, *at* 10 *A. M.*]

BOSTON, July 10, 1879.

Int. 72. When you used the apparatus without a battery, as stated in your last answer, what generated the electrical impulses which went over the line wire and vibrated the receiver?

Ans. I presumed that the electro-magnets and reeds were weak permanent magnets, on account of the residual magnetism caused by the passage of heavy battery currents through the coils, and that the vibration of the reed, when plucked by the finger, had occasioned a magneto-electric current upon the circuit similar to that which I had intended to produce by the vibration of the reeds of the harp arrangement devised in Canada.

Int. 73. Did you at that time, in June, 1875, attempt to generate these currents by vibrating a regular permanent steel magnet in front of a soft iron core, wound with coils of wire, when there was no battery on the circuit? And if you have the permanent magnet which you used, please produce it.

Ans. I did, upon the 2d of June, 1875; and I produce the permanent magnet then employed. The framework now attached to the magnet was not used at that time. The instrument was arranged in its present condition for the Centennial Exhibition at Philadelphia in 1876.

Int. 74. Did you, subsequently to this experiment of June 2, 1875, construct any apparatus for the purpose of vibrating a reed by the human voice in front of the poles of an electro-magnet? And

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if so, describe the first apparatus of that kind which you constructed, and state what induced you to construct it. If you have that instrument or any part of it, please produce it.

Ans. I did. The experiments made on the 2d of June, 1875, referred to above, solved the difficulty that had been in my mind since the summer of 1874, in regard to the practical operation of the various instruments I had devised for the reproduction of vocal utterance by electrical means. I had had the idea that magneto-electric currents generated by the vibration of permanent magnets or reeds would be too feeble to produce any useful practical results. But the experiments above described assured me that I had been mistaken in this idea, and I immediately, upon this same 2d of June, 1875, gave instructions to Mr. Watson to have my membrane arrangement constructed. One of the reeds employed in our experiments upon that day was to have been hinged to the pole of its electro-magnet, instead of being clamped, and the free end of the reed was to have been attached to the centre of a stretched membrane; a duplicate was to have been constructed as a receiver. One of the instruments was constructed within the next few days; but instead of hinging the steel reed, as I had intended, Mr. Watson used a thick armature which was pivoted to the pole of its electro-magnet. Portions of this instrument are still in existence, and I now produce them. I produce a duplicate of the original instrument. This duplicate has recently been constructed. The armature now upon the duplicate instrument is thinner than the original armature, and I now produce a duplicate of the original armature. The parts of the original instrument which I have are as follows: The wooden ring and wooden tube upon which the membrane was stretched, the original armature and electro-magnet and the cross bar to which the magnet was attached. The uncovered leg of the magnet, to which the armature was attached, was removed a day or two after the original instrument was constructed and another substituted for it. The pole of the uncovered leg was filed to an edge, and a steel reed was hinged to it by means of a strip of leather. This substitute is the one now attached to the original magnet produced.

Int. 75. Please state whether the uncovered leg of the electro-magnet, now on the duplicate, is constructed like either of those described in your last answer; and if so, which.

Ans. It is constructed like the original first made.

Int. 76. Please look at the wooden ring and stretched membrane now shown you, and state what difference, if any, there is between that and the ring and membrane now on the duplicate.

Ans. The rings are precisely similar. The membrane shown is made of sheepskin, and is somewhat thicker than the goldbeater's skin in the duplicate; and it is fastened to the ring by a wire tied round the groove of the ring instead of a string.

[*The duplicate and the extra armature, and the extra ring and membrane referred to by the witness in the last three answers, are put in evidence by the complainants, marked respectively* "*Exhibit* 19,* *Bell Telephone of* 1875, *Duplicate*," "*Exhibit* 20, *Bell Telephone of* 1875, *Sheepskin Diaphragm*," *and* "*Exhibit* 21, *Bell Telephone of* 1875, *Heavy Armature, W. P. Preble, Jr., Examiner.*"]

Int. 77. How soon after the 2d of June was the instrument described in your seventy-fourth answer made, when and where was it tried, and with what results?

Ans. I was anxious to try the instrument at once, and could not wait to have the duplicate receiver made; so, immediately upon its construction, I attempted to use it with one of my harmonic receivers. Upon passing a battery current through the coils of the instruments however, the attraction of the magnet was so great as to tear the heavy armature away from the membrane. Mr. Watson and I made a number of experiments with other membranes in place of the original, and I remember that we were enabled to use the instruments for a practical experiment at least upon one occasion. The stretched-membrane arrangement was placed in one of the rooms in the top part of Mr. Williams's building, and an ordinary harmonic reed receiver in the lower workshop. I do not now remember whether any battery was used, but it is my impression that in consequence of the accidents to our membranes we made the experiment without a battery. I distinctly remember shouting into the stretched membrane instrument, while Mr. Watson was down stairs listening with his ear pressed against the reed of the harmonic receiver. I do not remember definitely what the results were, excepting that I was encouraged by them to reconstruct the instrument with a lighter armature. I cannot fix the exact date of the experiment, and only know that it was during the month of June, 1875.

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* These are the new numbers adopted for the suit *American Bell Telephone Company* v. *People's Telephone Company*. The original numbers were 31, 32, 33.

Int. 78. What difficulty did you find from the heavy armature which led you to try a lighter one?

Ans. The armature was so strongly attracted by the electro-magnet as to be frequently torn from the membrane, and I presumed that a lighter armature would not only be less attracted, but would also be more easily moved by the membrane and would not be so liable to become detatched.

Int. 79. Please look at the letter dated June 28, 1875, which is now shown you and which was one of those which were identified in Mr. Hubbard's deposition, pages 431 and 440.* State whether you wrote and sent it to him at or about its date; and if so, read it as part of your answer.

[*Objected to as incompetent.*]

Ans. I did, and I now read it.

" SALEM, MASS., June 28, 1875.

"*Dear Mr. Hubbard:*

" Mr. Hutchings (the organ builder) kindly devoted the whole of this afternoon to the construction of a steel reed for me.

" One of the latest receiving instruments was enclosed in a wooden box, and had its armature so arranged as to be set in vibration by a current of air passed through the box. The instrument was completed this evening in time for trial. Mr. Hutchings operated the reed in a little room upstairs (Williams's office), while I observed the effect upon a receiving instrument placed in the basement of the building. The sound was so perceptible that I found it unnecessary to place my ear against the instrument. The vibration of the armature could also be seen and felt.

"No battery nor permanent magnet was used.

" I feel sure that a study of Ladd's or Wilde's magneto-electric machine will reveal a means of increasing the intensity of the induced currents. I am told that Prof. Lovering has one of Wilde's instruments in his possession, so I shall call upon him to-morrow for information concerning it.

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* These references are to pages of the printed record in the suit *Bell Telephone Company* v. *Dowd.*

"Prof. Pickering has left town for the summer. I propose having the steel reed still further altered to-morrow, so shall probably be at the organ factory (Hutchings, Plaisted & Co., Cambridge Street, near Charles Street) most of the afternoon instead of at Williams's. Shall call in the evening and report progress.

"Yours respectfully,

"A. GRAHAM BELL.

"GARDINER G. HUBBARD,
Brattle Street, Cambridge.

"P. S. The experiment referred to above was repeated when a single cell of a battery had been placed in the circuit. The amplitude of vibration of the armature downstairs was quite large enough to work the vibratory circuit-breaker. We were unable to try higher battery power on account of the sticking of the generating armature. When the instrument is altered to-morrow, I shall try higher battery power and test the resistance through which the current will pass.

"A. G. B."

Int. 80. Did you, before writing that letter, perform the experiments therein described with the results therein stated?

Ans. I did.

Int. 81. The letter speaks of the production of sound when no battery and no permanent magnet was used: what generated the electric current or impulse in that case?

Ans. The vibration of the armature acting upon the residual magnetism of the electro-magnet and armature. The instrument had been previously used in connection with a battery, and the core of the electro-magnet and the armature retained a slight magnetic condition.

Int. 82. During the month of June, 1875, and before the construction and use of the second membrane telephone, did you try any experiments in which electric currents were generated or effected by the vibration of a reed in front of an electro-magnet; and if so, to what extent and for what purpose?

LEPHONE COMPANY,-3

Ans. I was constantly occupied during the month of June, 1875, in experimenting to ascertain the best arrangement of coil, magnet and armature for generating electric currents in the manner indicated.

Int. 83. Please look at the letter now shown you, dated July 1, 1875, which is one of those identified in Mr. Hubbard's deposition, pages 431* and 440, and state whether you wrote it and sent it to Mr. Hubbard at or about its date; and if so, read it as part of your answer.

[*Objected to as incompetent.*]

Ans. I did; and I now read it: —

"SALEM, MASS., July 1, 1875.

" *Dear Mr. Hubbard:*

"The experiment to which I alluded when I saw you last promises to be a grand success. On singing this afternoon in front of a stretched membrane attached to the armature of an electro-magnet, the varying pitch of the voice was plainly perceptible at the other end of the line, no battery nor permanent magnet being employed. When the vibrations are received upon another stretched membrane in place of a steel spring, it is possible, nay, it is probable, that the 'timbre' of the sound will be perceived. I hope to try the experiment to-morrow afternoon.

"This morning, in dipping into a French work upon telegraphy, I came across a full description of the 'Typo-Télégraphe de M Bonelli.' I find it to be *identical* with our autograph arrangement, save that five telegraph wires are required instead of one for transmission.

" Bonelli gets over the difficulty of *prepared ink* by setting up his message in type. The brush of wires is passed over the raised surfaces of the letters, securing perfect contact at the proper places.

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* These references are to pages of the printed record of the suit *Bell Telephone Company* v. *Dowd.*

"I have an engagement to meet Prof. Lovering to-morrow morning at ten o'clock, and shall call upon you before returning to town.

"With kind regards,

"Yours respectfully,

"A. GRAHAM BELL.

"GARDINER G. HUBBARD, Esq.,
Brattle Street, Cambridge."

Int. 84. Did you, at or about the date of that letter, cause to be constructed a second membrane telephone; and if so, when, and have you any of the parts of it?

Ans. The same day I wrote this letter, namely, July 1, 1875, I gave instructions to Mr. Watson to have constructed a second membrane telephone. The instrument was completed a day or two afterwards, and some parts of it are still in existence, and I produce them.

Int. 85. Have you a duplicate recently constructed in accordance with said original second membrane telephone? If so, please produce it.

Ans. I have, and I now produce it.

Int. 86. Please look at the wooden ring and membrane now shown you, and state wherein it resembles or differs from the wooden ring and membrane now on said duplicate second instrument.

Ans. It differs from it in the membrane being made of sheepskin instead of goldbeater's skin.

Int. 87. Did your second instrument have the armature hinged to the uncovered leg of the magnet, like said duplicate, or did it have it attached with a leather hinge, as described in your seventy-fourth answer?

Ans. I am not sure, but my impression is that it was hinged with a leather hinge.

[*The duplicate instrument and the extra ring and membrane are put in evidence by complainants, marked "Complainants' Exhibit* 22,* *Second Bell Telephone of* 1875, *Duplicate," and "Exhibit* 23, *Second Bell Telephone of* 1875, *Sheepskin Membrane*."]

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* The original numbers were 34, 35.

Int. 88. What were the membranes made of in your original telephones of June and July, 1875?

Ans. Of goldbeater's skin used in single and sometimes double thicknesses.

Int. 89. What is the diameter of the inside ring over which the membrane was strained in those two original telephones?

Ans. The first one is about two and three quarters inches in the clear, the second about two and five eighths in the clear.

Int. 90. Did you try these two telephones in July, 1875, — one as transmitter, and one as receiver; and if so, where and with what results?

Ans. I did. One of the instruments was placed in the room at the top of Mr. Williams's building, and the other in the workshop below. I spoke to one of the instruments while Mr. Watson listened at the other, and *vice versa*. I do not remember with any great distinctness the details of the experiment, but I have a distinct recollection that during the course of the experiments Mr. Watson rushed up to the room at the top of the building where I was and informed me that he could distinctly hear me speaking, although he could not quite make out what I said. He had satisfied himself that the sounds he heard had been produced by the membrane telephone to which he had been listening.

[*Objected to.*]

Int. 91. Was Mr. Williams's workshop a quiet place or a noisy place at the time that you tried these experiments?

Ans. A very noisy place.

Int. 92. What conclusion did you at that time draw from these experiments with regard to the practicability of transmitting articulate speech by instruments having the same mode of operation and principle as these stretched membrane instruments that you had so experimented with?

[*Objected to.*]

Ans. I considered that the experiments demonstrated the practicability of transmitting articulate speech by instruments having the same mode of operation and principle as these stretched membrane instruments, and that it was only necessary to make further experiments to ascertain the best arrangement of the parts.

Int. 93. Please look at the letter now shown you, which is addressed to Mr. Hubbard, dated July 7, 1875, and is one of those identified upon pages 431* and 440 of the record. State whether you wrote and sent it to him at or about the time of its date; and if so, read it as part of your answer, omitting any parts that relate to family matters.

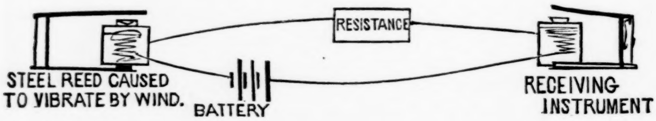
[*Objected to as incompetent.*]

Ans. I did, and I now read it: —

"SALEM, MASS., Wednesday, July 7, 1875.

"*Dear Mr. Hubbard:*

"I forgot to mention this evening the gratifying results obtained with the steel reed.



"When three cells of a battery were introduced into the circuit (as shown in the figure), the armature of the receiving instrument vibrated with considerable amplitude. When a damper was adjusted for it to strike against, the sound could be heard at a distance from the instrument.

"The helix at transmitting end had a resistance of about two ohms, and yet the vibration of the armature of the receiving instrument could be detected when a resistance of 100 ohms was introduced into the circuit. This seems to me to indicate more power than can possibly be due to magneto-electric currents, generated by the vibration of the reed.

"May not a pulsatory action be induced in *the voltaic current itself* by the motion of the reed? I can imagine the current alternately weakened and strengthened according to the distance of the armature from the pole underneath.

"In this case the pulsations would certainly be available for our purpose, by merely increasing the battery power sufficiently to overcome the resistance of the line. Magneto-electric currents are, however, evidently present, for a sound is perceptible at the receiving end when the battery is omitted altogether.

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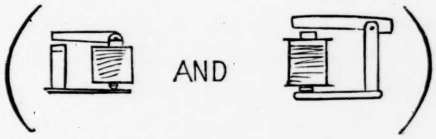
* These references are to the pages of the printed record in the suit *Bell Telephone Company* v. *Dowd.*

"I think also that the effects are in some way dependent upon the peculiar form of electro-magnet employed. I hope to get some light on the subject from Moncel. He devotes several pages to the discussion of peculiarities observed in the one-legged or 'lame' magnet (*boiteux*), shown in his work, as follows: —



"He says, 'Ce genre d'électro-aimant, que j'ai beaucoup étudié et le premier employé dans les applications électriques, a beaucoup d'avantages dont nous parlerons plus tard, et *une force beaucoup plus considérable qu'on ne semblerait le croire à première vue.*' . . .

"With kind regards, yours respectfully,

"A. GRAHAM BELL.

"Gardiner G. Hubbard, Esq.,
Brattle Street, Cambridge."

Int. 94. Please look at the letter now shown you, addressed to Mr. Hubbard, and dated Aug. 14, 1875, which is one of those identified on pages 431* and 440 of the record. State whether you wrote and sent it to him at or about the time of its date; and if so, read it as part of your answer.

[*Objected to as incompetent.*]

Ans. I did, and I now read it

"Salem, Mass., Aug. 14, 1875.

"*Dear Mr. Hubbard:*

"On glancing back over the line of electrical experiments, I recognize that the discovery of the magneto-electric current generated by the vibration of the armature of an electro-magnet in front of one of the poles is the most important point yet reached. I believe that it is the key to still greater things.

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* These references are to the pages of the printed record in the suit *Bell Telephone Company* v. *Dowd.*

"The effects produced, though slight in themselves, appear to me so great in proportion to their cause that I feel sure that the future will discover means of utilizing currents obtained in this way on actual telegraph lines.

"So important does it seem to me to protect the idea that I think some steps should be taken immediately towards obtaining a caveat or patent for the use of a magneto-electric current, whether obtained in the way stated above (by the vibration of permanent magnets in front of electro-magnets), or in any other way. I should wish to protect it specially as a means of transmitting simultaneously musical notes differing in *intensity* as well as in pitch.

"I can see clearly that the magneto-electric current will not only permit of the actual copying of *spoken utterance*, but of the simultaneous transmission of *any* number of musical notes (hence messages) without confusion.

"The more I think of it, the more I see that the method of making and breaking contact so many times per second is only the *first stage* in the development of the idea.

"When we can create a pulsatory action of the current which is the *exact equivalent* of the aerial impulses, we shall certainly obtain exactly similar results. *Any number of sounds* can travel through the same air without confusion, and any number should pass along the same wire.

"It should even be possible for a number of spoken messages to traverse the same circuit simultaneously; for an attentive ear can distinguish one voice from another, although a number are speaking together.

"Don't you think it would be well to take out a *caveat* for the use of the magneto-electric current?

"In its present undeveloped state, it might be unwise to let Gray know anything about it, unless indeed we could secure the *principle* of it in a patent.

"Yours respectfully,

"A. GRAHAM BELL.

"GARDINER G. HUBBARD, Esq.,
Cambridge."

Int. 95. In that letter you say, " The more I think of it, the more I see that the method of making and breaking contact so many times per second is only the first stage in the development of the idea": to which of your inventions, or to what class of apparatus, does that clause refer?

Ans. It refers to my method of harmonic multiple telegraphy, in which Mr. Hubbard was pecuniarily interested.

Int. 96. Have you within the past fortnight attempted to transmit articulate speech with the duplicate telephones Exhibits 19, 20, 21, 22 and 23? And if so, state when and where and with what results. If you used more than one membrane or more than one armature with each instrument, state what you used each time.

Ans. Last Saturday, July 5, I made an experiment with the duplicate telephones Exhibits 19 and 22, at No. 40 State Street, in the two rooms and with the arrangement of circuits described in Mr. Cross's third answer, page 383. The rings with the sheepskin membranes were used in the instruments and heavy armatures similar to that shown in Exhibit 21. I believe the exhibit is one of the armatures used. Mr. Watson and I were enabled to carry on a conversation by means of the membrane telephones. On Monday, the 7th of July, the same instruments were taken to Mr. Williams's workshop and placed under as nearly as possible the same conditions as the original membrane telephones used in July, 1875. Mr. Watson and I attempted to carry on a conversation by means of the instruments, but were unable to do so. I could hear sounds proceeding from the membrane telephone at my ear while Mr. Watson was speaking at the other end of the circuit, but I could not make out what he said. We could not find a quiet place in Mr. Williams's building to repeat the experiment under favorable conditions, and so carried the instruments to 40 State Street, and arranged them as we had done on Saturday, the 5th. We then found that we could carry on conversation by means of them. During the course of our experiment at 40 State Street, on Monday, the 7th, a fire alarm was struck; and while the bells were ringing, and during the intervals between the strokes, we were unable to carry on conversation. The results obtained during the ringing of the fire bell were similar to those obtained just before, at

Mr. Williams's workshop. The battery used at 40 State Street consisted of three small carbon and zinc cells with bichromate of potassium solution. The battery used at Mr. Williams's was of the same kind, but consisted of two large cells. Mr. Watson, Mr. Storrow, Mr. Berliner, Mr. J. B. Henck, Jr., and Dr. Clarence J. Blake were present at the experiments at Mr. Williams's workshop, and at No. 40 State Street, on Monday, the 7th inst. The sheepskin membranes and heavy armatures alone were used on the 5th and 7th instants. On Wednesday, the 9th inst., the goldbeater's skin membranes and light armatures were used in an experiment at No. 40 State Street. The instruments were then in the same condition in which they are now, and the arrangement of circuit was the same as has been already described in Mr. Cross's deposition. Mr. Watson and I spoke to one another by means of the instruments. I could hear the sound of Mr. Watson's voice very plainly, and could make out a number of words. The articulation was not so distinct as with the sheepskin membranes. The articulation of the instruments when first used was pretty distinct, but the membranes soon became damp by the action of the breath, and the articulation was then much less distinct. When the distinctness was least, however, I could still make out a word here and there of what Mr. Watson said at the other end of the circuit.

Int. 97. In these recent experiments which you have just described, did you hold the instrument so that the armature was substantially perpendicular with its hinged end upwards, or in what position did you hold it?

Ans. I held it in the position indicated, and in every other position I could think of, and observed that the position in which the instrument was held did not affect the audible results obtained.

Int. 98. Did you go to Canada for a vacation in the summer of 1875? If so, when did you go, and when did you return?

Ans. I did. I went to Canada in the early part of September, and returned to Boston about the first of October. When I speak of returning to Boston in this and other answers, I mean to the neighborhood of Boston, where my professional work was, though I lived out of town.

Int. 99. While in Canada in that vacation, did you apply to any

LEPHONE COMPANY,-3

one to assist you in obtaining patents in England, for any inventions you had made relating to the use of electricity; and if so, whom did you apply to?

Ans. I did. I applied to the Hon. George Brown in Toronto, on or about the twenty eighth day of September.

Int. 100. Please look at the letter now shown you, addressed to Mr. Hubbard, dated Sept. 28, 1875, and which was identified in Mr. Hubbard's deposition, pages 431* and 440, and state whether you wrote and sent it to him at or about its date; and if so, read such parts of it as relate to your electrical inventions.

[*Objected to as incompetent.*]

Ans. I did, and I now read from it as follows: —

"Imperial Bank of Canada, Toronto, Sept. 28, 1875.

"*Dear Mr. Hubbard:*

"You must not think that I have been neglecting telegraphy during my visit to Canada. I brought a couple of instruments with me, and have discovered a method of annihilating the spark that has caused me so much trouble, without the necessity of using a condenser. I have felt very anxious in the matter of foreign patents, and as I have not heard anything from the friends on the other side to whom I applied for assistance in the matter, I thought I would see friends in Toronto and Montreal. My idea was to get a letter of introduction to Sir Hugh Allan, and seek his aid in the matter. On consulting my friend, Hon. George Brown (ex-Premier of Canada), he became much interested, and offers, if the scheme seems likely to be a good thing, either to take up the matter himself or get two or three gentlemen to do so. I have arranged to write particulars at once to him in confidence, and if we come to an arrangement they will telegraph to England to set matters afoot there and on the Continent at once. I must be in Belleville to-morrow, but shall not delay in Montreal to see Sir Hugh. . . .

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* The references are to pages of the printed record in the case *Bell Telephone Company* v. *Dowd.*

"I shall try to see you as soon as possible. I cannot reach Boston before Friday or Saturday.

"With kind regards,
"Yours respectfully,
"A. GRAHAM BELL."

Int. 101. When did you begin to prepare the specification for your patent No. 174,465, of March 7, 1876?

Ans. During the month of September, 1875, in Canada, and I continued it in Boston when I returned, during the early part of October.

Int. 102. Have you any of the sheets on which your rough draft of that specification was made in October, 1875? And if so, please produce them.

Ans. I have, and I now produce them.

Int. 103. Please read from them as part of your answer the passages which I will point out to you on the sheets, which I will ask the examiner to number and mark for identification.

Ans. I read from Sheet 1: —

"My present invention consists in the employment of a vibratory or undulatory current of electricity in place of a merely intermittent one, and of a method of and apparatus for producing electrical undulations upon the line wire."

And the sentence ends there, and the next line consists of the word "Phono-telegraphy." The foregoing is written in pencil.

On the opposite side of the same sheet the page begins: —

"by inducing undulations in (upon) a continuous voltaic circuit by the motion of bodies capable of affecting the current, such as the armature of an electro-magnet, a permanent magnet or a body through which a continuous current of electricity is passed."

This is accompanied by a drawing substantially like A, Fig. 5 of said patent. This paragraph and the drawing are in ink.

I read from Sheet 2: —

"It has long been known that when a permanent magnet is caused to approach the pole of an electro-magnet, a current of electricity is induced in the coils of the latter, and that when it is made to recede, a current of electricity of opposite polarity to the first appears upon

EPHONE COMPANY,-3

the wire. When, therefore, a permanent magnet is caused to vibrate in front of the pole of an electro-magnet, an undulatory current of electricity is induced in the coils of the electro-magnet, the undulations of which correspond in number per second to the vibrations of the magnet, in polarity to the direction of motion of the permanent magnet, and in intensity to the amplitude of the vibration of the permanent magnet."

The portion I have just read is written in pencil.

On the same side of the same sheet there is also written in pencil the following: —

"CLAIMS.

"1. In a system of telegraphy in which the receiver is set in vibration by the action of the electrical current, the employment of vibratory or undulatory currents of electricity as distinct from merely intermittent currents.

"2. The method of inducing (impressing) undulations in a continuous voltaic current by the vibration or motion of bodies capable of affecting the current, whether such bodies be permanent magnets, the armatures of electro-magnets, or bodies through which a continuous current of electricity is passing.

"3. The phono-telegraph, whereby two or more vocal or other sounds, differing in pitch, loudness and *timbre*, can be transmitted singly or simultaneously along a single wire, by causing electrical undulations upon the wire, similar in *form* to the aerial vibrations accompanying said vocal or other sounds."

From Sheet 3 I read the following in pencil: —

"4. The method of producing an undulatory current by the vibration of a body through which a continuous current of elect. is passed . . . "

On the other side of the same sheet, in continuation of what I have just read, I find also in pencil the following: —

"6. The method of and apparatus for transmitting simultaneously sounds differing in 'timbre' as well as in pitch and in loudness.

"7. The method of and apparatus for transmitting vocal utterance telegraphically, substantially as herein set forth."

On Sheet 2 I find written in ink the following: —

"In illustration of the method of creating a vibrat. current of elect., I shall show and describe one form of apparatus designed to produce undulations in a continuous voltaic current. But I wish to state here that the same effect may be produced in many other ways, all that is necessary being to influence the current by the vibration or motion of bodies capable of affecting the current."

On Sheet 4 I find the following, written in ink: —

"CLAIMS.

"1. In a system of telegraphy in which the receiver is set in vibration by the passage of the electrical current, the employment of vibratory or undulatory currents of electricity as distinct from merely intermittent currents.

"2. The method of impressing (inducing) undulations upon a continuous voltaic current by the vibration or motion of bodies capable of affecting the current, whether such bodies be permanent magnets, armatures of electro-magnets, or bodies through which a continuous current of electricity is passing.

"3. The phono-telegraph, whereby the exact pitch, loudness and *timbre* of vocal or other sounds can be transmitted telegraphically, by causing the body, by whose motion undulations are induced upon the line wire, to copy exactly the aerial vibrations accompanying said vocal or other sounds, and hence to induce upon the line wire electrical undulations similar in *form* to those occurring in the air."

On the other side of the same sheet the page begins with the following, written in pencil: —

"In another application for Letters Patent I have described a method of and apparatus for transmitting two or more telegraphic . . ."

Int. 104. On that side of Sheet 4 from which you have just read something written in pencil, I find some writing in ink, the last few words of which are written over a few words of the pencil writing which you have just read: what is that which is written in ink?

Ans. It is a portion of the rough copy of a letter that I wrote to the secretary of the Philadelphia Institution for the Deaf and Dumb, relating to the proposed introduction of my father's system of visible speech into that institution, and the exhibition of that system at the Centennial Exhibition.

Int. 105. Please state when you wrote the said letter of which said sheet contains the rough draft, and state also whether you have any means of fixing the date.

Ans.. I wrote the letter during the latter part of October, 1875, or the commencement of November, 1875. I can fix the date as earlier than the 4th of November, by a letter which I wrote on the 13th of November, 1875, to Mr. James J. Barclay, secretary of the Institution for Deaf-Mutes, Philadelphia, in which the following occurs:—

"*My Dear Sir,* — Many thanks for your kind note of the 4th inst. I am sorry that the institution cannot consider my terms," etc.

The letter of the 4th inst., to which I refer, was in answer to the letter I wrote to Mr. Barclay, a portion of the rough copy of which appears upon Sheet 4.

Int. 106. The reverse side of Sheet 3 has some writing in ink which does not refer to electricity: please state what it is.

Ans. It is a portion of a rough copy of the same letter to the secretary of the Philadelphia Institution, to which I have referred, as written before the 4th of November, 1875.

Int. 107. The reverse side of Sheet 1, from which you have read something written in ink, contains something written in pencil which does not appear to relate to electricity: please state what it is.

Ans. It is a portion of the rough copy of a letter giving the supposititious history of a "Book of Ornamental Art."

Int. 108. Have you that letter, and when was it written?

Ans. I have; it was written and dated Oct. 26, 1875.

Int. 109. How many sheets did you produce in answer to my one hundred and second question?

Ans. Seven.

[*The seven sheets are marked for identification.*]

Int. 110. Are these all the original rough drafts made in preparing that specification which you now have?

Ans. They are.

Int. 111. Are they all that you made?

Ans. By no means.

Int. 112. Have you made search for the others, and have you been able to find them?

Ans. I have made search, but have been unable to find any others than those produced.

[*Adjourned to July* 11, 1879, *at* 10 *A. M.*]

BOSTON, July 11, 1879.

Int. 113. Please state whether the rough drafts for your specification, or the seven sheets of them which you produced yesterday, read consecutively, or in what condition they are as to roughness, rewriting, etc.

Ans. They do not read successively, and are merely fragmentary remains of my first attempts to put into correct language the ideas embodied in my specification. Some passages are written in pencil, others in ink, and many of them are so disfigured by the corrections and recorrections that I made in the language at the time, that it is difficult in some cases now to read them.

Int. 114. Was a specification prepared from these drafts for Mr. G. G. Hubbard to take to Washington and have examined by Mr. Pollok, your patent solicitor?

Ans. It was.

Int. 115. Did you learn from Mr. Hubbard at any time that Mr. Pollok had examined this specification with him, and found it satisfactory; and if so, when did you learn this? If you have any means of fixing the date with precision, please state what means you have.

Ans. I heard from Mr. Hubbard to this effect upon the 18th of January, 1876. I fix this date by reference to a letter that I wrote to Mr. Hubbard's daughter on the 18th of January, 1876, in which the following passage occurs: —

"I received a nice letter from your father this morning, in which he says how well pleased he is with the new specification, and that it promises to be of great value if I *prosecute my researches diligently;* if not, others may supplant me. He says, 'I have been over your specification with Mr. Pollok. He is very much pleased with it, and says he does not think it will require any alteration.'"

Int. 116. Have you in your possession the letter from Mr. Hubbard to you, referred to in your last answer?

Ans. I have not.

Int. 117. Have you made careful search for it?

Ans. I have, but have been unable to find it.

Int. 118. What day of the week was the 18th of January, 1876?

Ans. It appears by the calendar that it was Tuesday.

Int. 119. Please state when, if ever, you received from Mr. Pollok's office a fair copy of the specifications to be signed and sworn to; and if you have any means of fixing the date, please produce it.

Ans. I received a fair copy of the specification from Mr. Pollok's office either on the nineteenth or twentieth day of January, 1876, and I took oath to it in Boston on the twentieth day of January, 1876. I fix the date of receiving it by a memorandum which has been given to me, which I am informed and believe is a press copy of Mr. Pollok's letter to me accompanying the specification. It is as follows: —

"January 18, 1876.

"Mr. A. Graham Bell:

"*Dear Sir,* — Herewith find applic., papers, etc., for your new improvements in telegraphy. We have left blank for title of invention in the Oath, which you can fill in.

"Please execute the papers as indicated in pencil, and return them to me.

"Very truly yours."

Int. 120. Have you got the original of the letter just read?

Ans. I have not.

Int. 121. Do you know where it is?

Ans. I do not.

Int. 122. In whose handwriting was the fair copy of the specification which was sent you from Washington, as you stated?

Ans. I do not know. It was in a strange handwriting. I presumed it was written by some of Mr. Pollok's clerks.

Int. 123. Please look at the certified copy of the specification now shown you, and state when and where the *jurat* is dated.

Ans. Suffolk County, State of Massachusetts, the 20th of January, 1876.

Int. 124. It appears from this certified copy that said application was filed in the Patent Office, Feb. 14, 1876: why was it not filed sooner?

Ans. I had made arrangements to have the specification filed simultaneously in England and the United States, and delayed making the application in the United States Patent Office in the expectation of receiving a cablegram from England informing me when to file it.

[*Complainants put in evidence a certified copy of file wrapper and contents of Bell patent of March* 7, 1876, *marked* " *Complainants' Exhibit* 24, *Bell's Application of* 1876."]

Int. 125. Please look at the paper now shown you; state who made it.

Ans. I did.

Int. 126. When and where and for what purpose?

Ans. I made it at the Queen's Hotel, Toronto, on the twenty-eighth day of December, 1865, for the information of the Hon. George Brown.

Int. 127. What occasion had you to give him information on the matters shown in that paper?

Ans. I expected to conclude arrangements for having him take out patents in England for me, and made this drawing to illustrate certain of my inventions.

Int. 128. Is that the same Mr. George Brown spoken of in your letter to Mr. Hubbard of Sept. 28, 1875, which was read as part of your one hundredth answer?

Ans. It is.

Int. 129. State generally what inventions or what apparatus that paper shows.

Ans. The invention and apparatus described in my United States patent, dated March 7, 1876.

Int. 130. There appears to be a memorandum on the back of it not in your handwriting: who wrote that?

Ans. The Mr. George Brown referred to.

Int. 131. In whose possession did you leave it after you made it, and when did you next see it?

Ans. I left it in the possession of the Hon. George Brown, in Toronto, on the twenty-ninth day of December, 1875, and I next saw it in Toronto on the 12th of November, 1878, and requested Mr. Brown to intrust it to Mr. Thomas A. Watson, who brought it on to Boston.

[*Complainants put in evidence the paper referred to, and it is marked " Complainants' Exhibit 25, Bell's Toronto Drawing, W. P. Preble, Jr., Examiner."* [*Original number* 37.]

Counsel for defendant objects to the memorandum on the back of the drawing as evidence of any fact stated in it.]

Int. 132. After the grant of your patent, March 7, 1876, did you or did you not continue study or experiments on the subject of transmitting articulate speech or other sounds; and if so, for what purpose?

Ans. I did; for the purpose of introducing my invention into public use.

Int. 133. Did you exhibit any of your electrical inventions at the Centennial Exhibition at Philadelphia; and if so, what apparatus did you carry there for that purpose?

Ans. I did. I exhibited my method of harmonic multiple telegraphy, and my method of transmitting articulate speech electrically. The apparatus exhibited consisted of a telephonic organ, two current interrupters and two vibratory reed receivers, having attached to them what I termed vibratory circuit-breakers for working Morse instruments by my musical telegraphic signals. I also had the permanent horseshoe magnet which has already been produced, arranged over a single pole electro-magnet. Four forms of speaking telephones, which were briefly as follows: Two membrane telephones, which could be used either as transmitters or receivers. A single pole electro-magnet was used for one and a double pole electro-magnet for the other. The armature of each electro-magnet consisted of a small piece of steel spring glued to the centre of the membrane. A third form of speaking telephone was shown, intended to be used only as a receiving instrument. The electro-magnet was enclosed in a hollow box of iron, and a lid of iron or steel, I forget which, was used as an armature. This lid formed a thin circular metallic diaphragm, resting by its edge upon the rim of the iron box; its central portion not quite touching the pole of the electro-magnet underneath. The instrument was intended to be arranged upon a circuit with either of the membrane telephones referred to before. Upon placing the ear against the lid of the box, the articulation of the person speaking into the membrane telephone was audible, proceeding from the lid. A fourth form of speaking telephone was shown, intended to be used only as a transmitter. It consisted of a metallic ring supported horizontally, carrying a stretched membrane to the centre of which was fastened either a platinum wire or a thin rod of carbon, I forget which, dipping into a little cup containing acidulated water. In addition to these instruments, a form of apparatus was shown for studying optically the peculiarities of the electrical current produced by my telephones. It consisted of one of Koenig's manometric capsules, to the membrane of which was glued a thin piece of steel, which formed the armature of an electro-magnet.

Int. 134. Did you operate before the judges of the Centennial Exhibition any of your apparatus for the transmission of articulate speech which you had on exhibition there; and if so, what instruments did you so operate, when, and with what results?

Ans. I did. I exhibited in operation the two membrane telephones with electro-magnets referred to in my last answer, and the iron box receiver, to the judges of that section, on Sunday, the twenty-fifth day of June, 1876. The result was that the articulation of the person speaking into the membrane telephone was audibly reproduced by the iron box receiver, and the person who placed his ear against the lid of the instrument heard and understood what was said at the other end of the circuit.

Int. 135. Name some of the persons who were present at that exhibition.

Ans. Sir William Thomson, the Emperor of Brazil, Prof. Hilgard, Prof. James C. Watson, Dr. Draper, Dr. Koenig, Mr. Elisha Gray, Prof. Sterry Hunt, Mr. William H. Hubbard, and many others whose names I do not now recall.

Int. 136. Did you receive any letter written on that day by any gentleman present at that exhibition, referring to the results obtained? And if so, please read it as part of your answer.

[*Objected to as incompetent.*]

Ans. I did, and now read it. It is from Prof. Sterry Hunt: —

"CONTINENTAL HOTEL, PHILA., June 25, 1876.

"*Dear Mr. Bell:*

"I am informed that you leave to-night for Boston, so I take this way of congratulating you on your success to-day. I returned to my hotel with Sir Wm. Thomson, and dined with him.. He speaks with much enthusiasm of your achievement. What yesterday he would have declared impossible he has to-day seen realized, and he declares it the most wonderful thing he has seen in America. You speak of it as an embryo invention, but to him it seems already complete; and he declares that before long, friends will whisper their secrets over the electric wire.

"Your undulating current he declares a great and happy conception.

"All this he discussed partly with Dr. Bache, and more at length with Sir Redmond Barry and Sir John Hawkshaw. Sir William leaves here on Friday for Montreal, and will visit Boston for a day or two before sailing, which will be from New York, July 19.

"Thinking you would be glad to hear the judgment of one so eminent, I have written you this, and I am, my dear Mr. Bell,

"Always truly yours,

"T. STERRY HUNT.

"P. S.—Do you know anything of Brücher's system of visible speech, of which one of the Austrian judges spoke to-day? It seems very like your father's.

"GRAHAM BELL, Esq."

Int. 137. How soon after that did you leave Philadelphia?

Ans. I left Philadelphia the same night.

Int. 138. Did you receive a visit from Mr. Gray in Philadelphia; and if so, when and where was it, and in whose presence?

Ans. I did. Mr. Gray visited me at my hotel on that Sunday afternoon or evening, after our exhibitions, and just before I left for Boston. Mr. William Hubbard was visiting me at the same time, and was present when Mr. Gray came.

Int. 139. How sure are you that it was after your exhibition, and not the day before? And state what, if anything, confirms your recollection on that point.

Ans. I remember that Mr. William Hubbard was present at the time of Mr. Gray's call, and that Mr. Hubbard did not reach Philadelphia until about twelve o'clock at night the evening before. A telegram had been sent to Mr. Hubbard, in Boston, requesting him to come to Philadelphia to assist me in operating my apparatus on Sunday. He arrived, as stated, just in time to take part in the experiments, and I left for Boston on Sunday night. I am therefore absolutely sure that Mr. Gray's visit to me was on Sunday, June 25, 1876, and I remember that it was after our respective exhibitions and before I left for Boston.

Int. 140. Was the visit from Mr. Gray a friendly and pleasant one, or not?

Ans. It was a very friendly and pleasant visit.

Int. 141. Did Mr. Gray at that visit say to you that he had invented a speaking telephone?

Ans. I have no recollection of such a remark, and I am quite sure that he did not; for under the circumstances, I should have been certain to have remembered it.

Int. 142. What receiver did you design to use with the liquid transmitter you say you exhibited at Philadelphia?

Ans. I had intended to use the iron box receiver with the liquid transmitter at the Centennial Exhibition, but I had also been in the habit of using the membrane telephones with electro-magnets for that purpose.

Int. 143. Had you or had you not transmitted articulate speech by means of that liquid transmitter before sending it to Philadelphia?

Ans. I had.

Int. 144. Please produce the three membrane telephones and the iron box telephone which you had at Philadelphia.

Ans. I now produce them. The membranes of all the membrane telephones are broken, and the armature of one magneto instrument is gone. The mouthpiece of the double-pole magnet telephone is also injured. The mouthpiece of the liquid transmitter has been disfigured by being used for subsequent experiments. The platinum wire or carbon rod of the liquid transmitter, with its connecting

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wire, is missing. The lid or diaphragm of the iron box receiver is wanting, and the coil in this instrument is not the one used at the Centennial Exhibition.

Int. 145. What is the size of the diaphragm in each of these four instruments?

Ans. In the three membrane instruments the diameter of the membrane was two and three quarters inches. In the iron box receiver the diameter of the metallic diaphragm was one inch and a half.

[*Complainants put in evidence the telephones referred to, and they are marked respectively* " *Complainants' Exhibit* 26, *Bell's Single Pole Centennial Membrane Telephone*"; " *Complainants' Exhibit* 27, *Bell's Double Pole Centennial Membrane Telephone*" : " *Complainants' Exhibit* 28, *Bell Centennial Iron Box Magnet Receiver*"; " *Complainants' Exhibit* 29, *Bell Centennial Liquid Transmitter,*" *W. P. Preble, Jr., Examiner.*] [*Original Nos.* 38, 39, 40, 4 .]

Int. 146. Please look at the letter now shown you, dated July 2, 1876; state to whom it is written, and read it as part of your answer, omitting the personal and family matters. State when you wrote and sent it.

[*Objected to as incompetent.*]

Ans. It is a letter written by me to Mr. William H. Hubbard, on the 2d of July, 1876, although by inadvertence it was dated July 2, 1867. I sent it on or about the 2d of July, 1876; I now read it: —

" CAMBRIDGE, MASS., July 2, 1867.

" *My dear Willie:*

" . . . Willie Winlock and Bert Eustace went in to Boston to help me on Thursday in case it was decided to work my instruments between Boston and Philadelphia. They were to sing for me. . . .

" Having completed my list of messages, I must really now speak of my telegraphic instruments. I can't tell you how glad I was to receive your telegram about your exhibit before Sir William. Mrs. Hubbard and *all the family* feel very proud of you for being able to exhibit so successfully my electrical apparatus. I had no idea that you would have to remove the apparatus to the judge's hall. Poor fellow, what a time you must have had! I really do feel very proud of you that you should have made everything go smoothly. I am very anxious about Saturday. What should I have done without you, or rather what should I do now without you? I am afraid you must think me very ungrateful for not having written; but the fact is, that in preparing for transmitting sounds to Philadelphia from here, I made such a startling discovery that I have been unable to do anything else since but experiment. In order to attempt the transmission of speech to Philadelphia, it was necessary to have a telephone constructed the magnet of which should have a resistance equivalent to a considerable portion of the total resistance of the telegraph line between here and Philadelphia. The resistance of the line is over 5,000 ohms. Now I have had two magnets made, the coils of which offer a resistance of 3,250 ohms both together. It would require a battery of many cells in order to operate a Morse sounder through such a resistance. It is as great a resistance as 325 miles of well-insulated telegraph wire! My discovery was that I could work my apparatus with *one cell of battery* through this resistance. I am sure by substituting a *permanent magnet* for the pole of the electro-magnet, I could work it *without a battery at all*. . . .

"With love and best wishes,

"Yours sincerely,

"A. GRAHAM BELL.

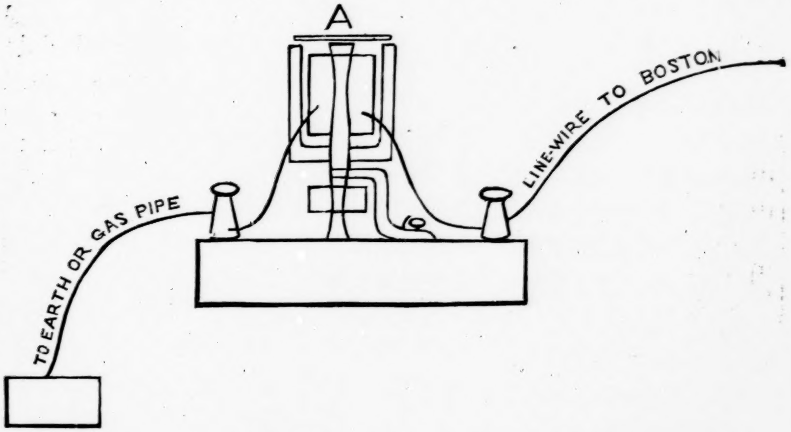
"MR. WILLIAM HUBBARD,
East Gall., M. B.,
Exhibition Building, Phila.

"P. S. — Should I send on apparatus to Philadelphia and you make the connections, simply connect the instr. with the line wire and the earth like this: —

"A. G. B.

"You can increase musical sounds by resting bridge of violin against A."

Int. 147. In this letter you say, "I am sure by substituting a permanent magnet for the pole of the electro-magnet, I could work it



without a battery at all": state when you first thought of transmitting sounds without a battery.

[*Objected to as incompetent.*]

Ans. My original idea in the summer of 1874 was to transmit sounds by means of magneto-electric currents without a battery; and from the time of the first conception of the speaking telephone I had the belief that the apparatus could be operated by substituting a permanent magnet for the soft iron core of the electro-magnet.

Int. 148. Then why did you use a battery with your speaking telephone?

Ans. Because the effects obtained were much more powerful with a battery than without; and because I had the idea that in operating the instruments through any considerable resistance, as upon a real telegraph line, the battery would produce the most practically useful results.

Int. 149. Have you a memorandum of experiments made by you on the transmission of sounds June 30, 1876? If so, please produce it and state when you made the memorandum.

[*Objected to as incompetent.*]

Ans. I have. The memorandum was made on the 30th of June, 1876, and I now produce it.

Int. 150. State whether you made the experiment on that day as there described.

Ans. I did.

Int. 151. Answer the same questions as to experiments made July 3, 1876, on the same subject.

[*Objected to as incompetent.*]

Ans. I made the memorandum of the experiments referred to upon the 3d of July, 1876, and the experiments related were made upon that day, and I now produce the memorandum.

Int. 152. Answer the same questions as to experiments made July 6, 1876, on the same subject.

[*Objected to as incompetent.*]

Ans. I made the memorandum of the experiments referred to upon the 9th of July, 1876. The experiments themselves were made on Thursday, the 6th of July, and I produce the memorandum.

Int. 153. What is the Fig. 2, page 17, referred to in the first line of the experiments of July 6?

Ans. It is Fig. 2, under date of July 3, 1876.

Int. 154. Please answer the same questions as to experiments of July 7, 1876, which are numbered 5, 6 and 7, in the same note book referred to in your last answers.

[*Objected to as incompetent.*]

Ans. The notes of these experiments were written by me upon the 9th of July, 1876, and the experiments themselves were made on the evening of Friday, the 7th of July, and I produce the notes.

Int. 155. Did you, during the summer of 1876, have made for you a two-pole permanent magnet with a coil of wire wound round each leg, after the manner of a horseshoe electro-magnet; if so, who made it, and when was it made?

Ans. I did. It was made at Mr. Williams's workshop, in July, 1876, — on or before the fifteenth day of July, 1876.

Int. 156. Please read from Mr. Williams's book the charge for making it.

Ans. "JULY 15, 1876.
"A. G. BELL & Co., Dr.
"To making mag. 3⅜ in. long of steel, coils or 38 D. C. Wire,
"1740 ohms. $14.75."

Int. 157. Have you a memorandum of experiments made July 11, 1876? And if so, please produce the memorandum. State when and by whom it was made, and whether on said day you tried the experiments therein described.

[*Objected to as incompetent.*]

Ans. I have. The memorandum was made by me upon the 12th of July, 1876, and the experiments narrated were made the day before, and I now produce the memorandum.

Int. 158. Have you a memorandum made on or about July 12, 1876, of modifications of the speaking telephone which you devised on or before that day? If so, state when you made that memorandum, and produce it.

[*Objected to as incompetent.*]

Ans. I have. I made the memorandum upon the twelfth day of July, 1876, and I now produce it.

Int. 159. Have you a memorandum of experiments made between Oct. 2 and 7, 1876? If so, state by whom the memorandum was made, and when, and produce it.

[*Objected to as incompetent.*]

Ans. I have. I made the memorandum on the 14th of October, 1876, and I now produce it.

Int. 160. Have you a memorandum as to certain experiments made by you between Oct. 12 and Nov. 12? And if so, state when and who made them, and produce them.

[*Objected to as incompetent.*]

Ans. I have. I made the memorandum on the 12th of November, 1876, and I now produce it.

Int. 161. Did you, on the dates stated in these several memoranda, make the experiments therein described as having been made?

Ans. I did.

[*Copies of all the memoranda above referred to are introduced by the complainants, and marked "Complainants' Exhibit* 30, *Bell's Memoranda of Experiments of* 1876, *W. P. Preble, Jr., Examiner.*"] [*Original No.* 42.]

Int. 162. Please state when you first used the permanent magnet made for you by Mr. Williams on or before July 15, 1876.

Ans. I used it immediately upon its construction.

Int. 163. Please produce that magnet.

Ans. I now produce it.

[*Complainants put in evidence the permanent magnet referred to, and it is marked " Complainants' Exhibit* 31, *Bell's Permanent Magnet of* 1876, *W. P. Preble, Jr., Examiner."*] [*Original No.* 43.]

Int. 164. Did you, on or about October or November, 1876, work a telephone between Boston and Cambridge without a battery and by means of a permanent magnet? And if you have any memorandum of such an exhibition, please state what it is and read it.

[*Objected to as incompetent.*]

Ans. I did, and I have a memorandum of such an exhibition. It is contained in a letter written by me on the 12th of November, 1876, and is as follows: —

"18 Beacon Street, Boston, Mass.,
Sunday, Nov. 12, 1876.

" . . . The telephone once more comes out triumphant from a severe test. Prof. Rogers and Mr. Waldo of the Observatory and I carried on conversations with Mr. Watson through the telegraph line between Boston and Cambridge with perfect ease. The articulation was perfectly distinct, and even a whisper was intelligible. The length of the circuit was about seven miles; but as there were no less than six electro-magnets upon the line, the resistance of the line was fully equivalent to fifteen or sixteen miles. We cut out the battery, and could distinctly hear the tones of Mr. Watson's voice singing one of Moody and Sankey's hymns, without any battery at all. This evening we have made another discovery of a very important kind, which will lead to the reduction of the battery required or to the omission of batteries altogether."

Int. 165. If you have any memorandum or letter which will enable you to fix the date when you made the Toronto drawing, Exhibit 37, referred to in your one hundred and twenty-sixth answer, please read from it the portions which refer to that drawing.

Ans. I have such a letter, dated Queen's Hotel, Toronto, Dec. 28, 1875, which I wrote upon that date. In it I find the following: —

"It is pretty evident that George Brown intends taking up telegraphy abroad for me; still I don't allow myself to indulge in too many hopes, lest I should be disappointed.

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"He asked me to state definitely what interest I would be willing to give him; so I offered him one half interest in any patents he would take out abroad for me. He stated that the proposition was satisfactory, and that he would take the night to think of it. I am to meet him to-morrow at eleven o'clock. In the mean time I intend to employ myself upon telegraphy.

"I shall make drawings of the instruments and line connections, and think the whole subject over very carefully, so as to be prepared to state exactly what I want done for me."

The Exhibit 25 is one of the drawings referred to in the letter.

Int. 166. Please look at the official copy of your English patent, No. 4,665, dated Dec. 9, 1876, and state when the provisional specification for that patent was drawn, and where and by whom it was drawn.

Ans. It was drawn by Mr. G. W. Gregory and myself in Boston. I do not remember the exact date, but my impression is that it was commenced in September or the beginning of October, 1876, that there was a delay of two or three weeks in completing it, and that it was completed about the end of October or the commencement of November.

[*Complainants produce an official copy of said patent and put in extracts from it as follows: The title and date of filing the provisional specification (to wit, Dec.* 9, 1876), *and the "fourth plan" and "fifth plan" found on pages* 8 *and* 9 *of said printed copy of the provisional specification, and the drawings Figs.* 19 *to* 26 *inclusive, in said extracts referred to. It is marked "Complainants' Exhibit* 32, *Extract from Bell's English Provisional Specification."*]

[*Adjourned to July* 12, 1879, *at* 11 *A. M.*]

BOSTON, July 12, 1879.

Int. 167. Please look at the instrument now shown you; state when it was made, and if it is one of the instruments referred to in any of the memoranda of experiments which have been put in evidence, Exhibit 30, please point out under what date in those memoranda it is first referred to.

Ans. I have no means of fixing the date when it was made, *Int.* 163. Please produce that magnet.

Ans. I now produce it.

[*Complainants put in evidence the permanent magnet referred to, and it is marked* " *Complainants' Exhibit* 31, *Bell's Permanent Magnet of* 1876, *W. P. Preble, Jr., Examiner.*"] [*Original No.* 43.]

Int. 164. Did you, on or about October or November, 1876, work a telephone between Boston and Cambridge without a battery and by means of a permanent magnet? And if you have any memorandum of such an exhibition, please state what it is and read it.

[*Objected to as incompetent.*]

Ans. I did, and I have a memorandum of such an exhibition. It is contained in a letter written by me on the 12th of November, 1876, and is as follows: —

" 18 BEACON STREET, BOSTON, MASS.,
Sunday, Nov. 12, 1876.

" . . . The telephone once more comes out triumphant from a severe test. Prof. Rogers and Mr. Waldo of the Observatory and I carried on conversations with Mr. Watson through the telegraph line between Boston and Cambridge with perfect ease. The articulation was perfectly distinct, and even a whisper was intelligible. The length of the circuit was about seven miles; but as there were no less than six electro-magnets upon the line, the resistance of the line was fully equivalent to fifteen or sixteen miles. We cut out the battery, and could distinctly hear the tones of Mr. Watson's voice singing one of Moody and Sankey's hymns, without any battery at all. This evening we have made another discovery of a very important kind, which will lead to the reduction of the battery required or to the omission of batteries altogether."

Int. 165. If you have any memorandum or letter which will enable you to fix the date when you made the Toronto drawing, Exhibit 37, referred to in your one hundred and twenty-sixth answer, please read from it the portions which refer to that drawing.

Ans. I have such a letter, dated Queen's Hotel, Toronto, Dec. 28, 1875, which I wrote upon that date. In it I find the following: —

" It is pretty evident that George Brown intends taking up telegraphy abroad for me; still I don't allow myself to indulge in too many hopes, lest I should be disappointed.

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"He asked me to state definitely what interest I would be willing to give him; so I offered him one half interest in any patents he would take out abroad for me. He stated that the proposition was satisfactory, and that he would take the night to think of it. I am to meet him to-morrow at eleven o'clock. In the mean time I intend to employ myself upon telegraphy.

"I shall make drawings of the instruments and line connections, and think the whole subject over very carefully, so as to be prepared to state exactly what I want done for me."

The Exhibit 25 is one of the drawings referred to in the letter.

Int. 166. Please look at the official copy of your English patent, No. 4,665, dated Dec. 9, 1876, and state when the provisional specification for that patent was drawn, and where and by whom it was drawn.

Ans. It was drawn by Mr. G. W. Gregory and myself in Boston. I do not remember the exact date, but my impression is that it was commenced in September or the beginning of October, 1876, that there was a delay of two or three weeks in completing it, and that it was completed about the end of October or the commencement of November.

[*Complainants produce an official copy of said patent and put in extracts from it as follows: The title and date of filing the provisional specification (to wit, Dec.* 9, 1876), *and the "fourth plan" and "fifth plan" found on pages* 8 *and* 9 *of said printed copy of the provisional specification, and the drawings Figs.* 19 *to* 26 *inclusive, in said extracts referred to. It is marked "Complainants' Exhibit* 32, *Extract from Bell's English Provisional Specification.*"]

[*Adjourned to July* 12, 1879, *at* 11 *A. M.*]

BOSTON, July 12, 1879.

Int. 167. Please look at the instrument now shown you; state when it was made, and if it is one of the instruments referred to in any of the memoranda of experiments which have been put in evidence, Exhibit 30, please point out under what date in those memoranda it is first referred to.

Ans. I have no means of fixing the date when it was made, excepting that it was before the 30th of June, 1876. My impression is that it had been made at least a month before, but of this I cannot be sure. The first note I have of its use is in the memorandum Exhibit 30, dated June 30, 1876, where it is referred to as "a flat disk of Tagger's iron," and is shown in the first figure as the diaphragm Z.

Int. 168. Please describe generally what this instrument is.

Ans. It is a disk of soft sheet iron, known as Tagger's iron, mounted on a stout metallic ring or rim about four inches and a half interior diameter, the whole supported on three legs like a tripod. In use it was placed upon a base, and magnets of different kinds were placed under the diaphragm, with some arrangement for adjusting their distance from the diaphragm.

Int. 169. Was that instrument used as a transmitter on any occasion other than June 30, 1876?

Ans. It was so used on a number of subsequent occasions.

[*Complainants put in evidence said instrument, and it is marked "Complainants' Exhibit* 33, *Bell's Speaking Telephone Metallic Diaphragm, W. P. Preble, Jr., Examiner*."] [*Original No.* 45.]

Int. 170. I call your attention to the subject of the interview at which Prof. Dolbear, Mr. Hubbard and yourself were present, and which is referred to on page 304 * and subsequently, in Prof. Dolbear's deposition, and on page 436 * and subsequently, in Mr. Hubbard's deposition. Please state what, if anything, you said to Prof. Dolbear as to whether he or you had first invented the use of a permanent magnet as part of or attached to the core of the electro-magnet of a speaking telephone, or as to whether he or you had first invented the use of a metallic diaphragm in a speaking telephone.

Ans. I have no recollection of saying anything to Prof. Dolbear upon the subject. I was more a witness of the conversation between Prof. Dolbear and Mr. Hubbard than a participant in it.

Int. 171. In your fifty-first answer, you referred to a letter which you received from Dr. Clarence J. Blake, dated Oct. 21, 1874, in which he referred to a letter from Mr. Elisha Gray: have you since

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* These references are to pages of the printed record in the suit *Bell Telephone Company* v. *Dowd*.

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seen that letter of Mr. Elisha Gray to Dr. Blake, and where is it now?

Ans. I have. Dr. Blake produced the letter as a part of his deposition in the harmonic telegraph interference case between Mr. Elisha Gray and myself, and a copy of it is to be found at page 121 of the printed evidence in that case.

Int. 172. Does that letter from Mr. Gray make any reference whatever to the transmission of vocal sounds, or make any statements as to the character of Mr. Gray's inventions, experiments or apparatus?

Ans. It does not.

Int. 173. Have you ever experimented to any considerable extent with diaphragms of different sizes, thicknesses and elasticity in speaking telephones? And if so, state what effect such differences have upon sounds produced at the receiving end.

Ans. I have made some hundreds of experiments for the purpose of ascertaining the effect of such differences upon the sound produced at the receiving end. When diaphragms of similar thickness were used, the following effects were noted: When the diameter was very large, say six inches, the articulation of the person speaking against it was reproduced by the receiving instrument distinctly, unchanged in pitch, but slightly peculiar in quality. A hollow resonant effect accompanied the articulation, somewhat as if the person were speaking with his head inside a barrel. When diaphragms of less diameter were used, the articulation of the speaker was not impaired, but the resonant effect accompanying the voice was less and less as smaller diaphragms were used, and a point was reached when the quality of the reproduced sound was not sensibly different from that of the speaker. When plates of still smaller diameter were employed, a nasal and slightly disagreeable effect accompanied the articulation. With extremely small diaphragms a sort of "Punch and Judy" effect was produced. Similar effects were noted with diaphragms of similar diameters, but of different thicknesses. A very thin diaphragm gave the hollow effect, a medium thickness gave a more natural quality of voice, and a thick diaphragm occasioned the nasal or "Punch and Judy" effect. In all these cases the pitch of the reproduced sound was the same as that which occasioned the vibration of the transmitting diaphragm, and the articulation was equally distinct in every case. The quality accompanying the articulation was alone affected by the variations in the diameter and thickness of the transmitting diaphragms used.

[*Certain original papers and instruments have been produced by the witness, and have not been introduced as exhibits. The complainants offer them for inspection of the defendants' counsel, and will produce them upon cross-examination, if required.*]

[*Adjourned to Monday, July* 14, 1879.]

BOSTON, July 14, 1879.

Int. 174. I call your attention to your London lecture, delivered before the Society of Telegraph Engineers, extracts from which have been put in evidence for the defendant: please state the circumstances under which you delivered that lecture.

Ans. I was invited to deliver a lecture before the Society of Telegraph Engineers for the purpose of showing the various steps that had resulted in a speaking telephone. I accepted the invitation, and a special general meeting of the society was called. I delivered the lecture on the 31st of October, 1877, without notes, giving the various stages as well as I could from memory, as I had no memoranda with me to which to refer.

Int. 175. I call your attention to the extract on page 407 of that lecture, which the defendant has put in on page 183 of the record. State what experiment it was that you had in mind and which you there referred to in the following sentence: "My friend Mr. Thomas A. Watson, who assisted me in this first experiment, declared that he heard a faint sound proceed from the telephone at his end of the circuit, but I was unable to verify his assertion."

[*Objected to as incompetent.*]

Ans. I gave my recollection of the result of the first experiment made with the membrane telephone referred to in my seventy-fourth answer.

Int. 176. At the time you gave your London lecture, what was your recollection as to the receiver used at that time, and as to whether your two first membrane telephones were made at the same time or at different times?

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[*Objected to as incompetent.*]

Ans. It was my recollection that immediately upon performing the experiment illustrated by Fig. 22 and described in my seventy-first answer, I gave instructions to Mr. Watson to have two membrane telephones constructed; that they were constructed within a few days, and tried, with the results noted in the passage quoted in the preceding question. My impression at the time of my lecture was that my first two membrane telephones were constructed at the same time, and that one of them was used as a receiver in my first experiment.

Int. 177. State whether you did or did not, before the issue of your patent March 7, 1876, construct or use any membrane speaking telephones other than the two of which Exhibits 19, 22 [original Nos. 31, 34] (see your seventy-sixth and eighty-seventh answers) are duplicates.

Ans. I did not.

Int. 178. What did you mean by the following passage from page 407 of your London lecture: "The results, however, were unsatisfactory and discouraging"?

Ans. I expected so much that I was naturally disappointed to be unable myself to hear the results I had anticipated.

Int. 179. Were you or were you not discouraged by these discouraging results?

Ans. I was not. I never wavered in a full and firm belief that I had solved the problem of the transmission of articulate speech electrically, and that the apparatus we had constructed could be used for that purpose.

Int. 180. When did you first construct a membrane telephone with a piece of clock spring about the size and shape of your thumb nail, glued to the centre of the diaphragm?

Ans. Shortly after the granting of my patent of March 7, 1876; I think within the month of March.

Int. 181. I observe that the telephones constructed in June and July, 1875, of which Exhibits 19 and 22 have been put in evidence as duplicates, have a cylindrical and rather short tube between the membrane and the mouth of the speaker or ear of the listener. Had you ever, before your application for the patent of March 7, 1876, used cones for the two telephones of the shape shown in Fig. 7 of that patent?

Ans. I had not.

Int. 182. Why did you show, in your patent, the cone A, which you there describe as "used to converge sound vibrations upon the membrane," and the cone L, from which the listener hears the sound proceed?

Ans. Because I believed such cones to be advantageous. These forms were well known in the state of the art at that time. I had become familiar with cones like that shown at A, for the purpose of conveying sound vibrations upon a membrane during the course of experiments with the phonautograph; and a cone of the form shown at L was known to be often used in the construction of hearing trumpets.

Int. 183. Why did you show in Fig. 19 of your English patent, as one form of telephone, two cones flaring out from the membrane, both like A in Fig. 7 of the United States patent, instead of one flaring one and one converging one?

Ans. I thought that the illustration of my United States patent, Fig. 7, might suggest the idea that one instrument was to be used only as a transmitter and the other only as a receiver; and I sought in my English specification, by making the two instruments of identical construction, to show that they could be used reciprocally.

Int. 184. Please look at Fig. 25, on page 408 of your London lecture, and which purports to be a drawing of an iron cylindrical box receiving telephone. The disk armature appears to be fastened to the box with a screw or rivet. Did you ever use one so fastened? State if you know how it happened that drawing was so made.

Ans. I presume that this drawing was made from an instrument which was presented to Sir William Thomson. I had the screw or rivet placed on the instrument, in order that the metallic disk should not be lost. It was not intended to be used so fastened. The instrument I gave to Sir William Thomson was not the one used at Philadelphia, and is different in shape, though essentially the same.

[*Adjourned to Thursday, July* 17, 1879.]

BOSTON, July 21, 1879.

Cross Examination by CAUSTEN BROWNE, Esq., *of Counsel for Defendant.*

Cross-Int. 185. In your sixtieth answer you speak of making an exhibition in March, 1875, in the presence of Mr. Doten and Mr. Prescott, of your "method of multiple transmission of telegraphic messages": do you here refer to the same invention which is mentioned in the fifty-ninth answer, where you say, "I was then in interference with Mr. Elisha Gray on the subject of harmonic multiple telegraphy"?

Ans. I do.

Cross-Int. 186. This invention so in interference with Mr. Gray was that for which you had filed application Feb. 25, 1875, as mentioned by you in your patent No. 174,465, on page 56 of the record, was it not?

Ans. I made several applications, and the one alluded to was one of these.

Cross-Int. 187. I suppose that you refer to the same invention, where you speak in your ninety-fifth answer of your method of harmonic multiple telegraphy in which Mr. Hubbard was pecuniarily interested?

Ans. I do.

Cross-Int. 188. And I suppose this is the same invention or method which is referred to by you under the expression "harmonic telegraphy or multiple telegraphy," used in your eighth answer, and "my system of harmonic telegraphy," used in the thirteenth and also in the nineteenth answer?

Ans. It is.

Cross-Int. 189. The method of multiple telegraphy in question is described in your interference application of Feb. 25, 1875, as consisting in the simultaneous transmission of signal sounds or tones telegraphically by the use of several tuned transmitting reeds and a like number of correspondingly tuned receiving reeds?

Ans. The method is not described in my application in the language of the question, but is substantially described as a method of transmitting a number of electric signals, or telegraphic signals or messages, simultaneously along a single wire by means of current interrupters and electro-magnetic receivers having vibratory armatures tuned to correspond to one another.

Cross-Int. 190. Is any allusion made in that specification to the use of any one of those tuned receivers for the purpose of hearing any tone except the tone of the transmitter tuned in correspondence with it?

Ans. There is no allusion to this unless the sentence "but other arrangements for the purpose may be devised," in illustration of which I describe a telephone as one form of common receiver, can be taken to allude to this.

Cross-Int. 191. Please describe a little more fully the telephone indicated in the passage referred to, "being a telephone from the rod of which silk threads may lead to a series of bodies, such as tuning forks," etc.; the construction of the telephone being such that "in case two or more different sets of impulses be transmitted simultaneously to the telephone, each will affect that one alone of the tuning forks whose vibrations are synchronous with the impulses."

Ans. I referred to the receiving instrument of Reis's telephone, consisting of a rod of iron about six inches in length, supported by its ends upon a sounding box, and placed in the interior of a helix of copper wire.

Cross-Int. 192. Referring to your nineteenth answer, where you say that in November, 1873, you heard from a single one of your tuned receivers, tones of different pitches transmitted by transmitters of different pitch, I understand the apparatus in the use of which this occurred to have been such an one as is represented in the drawing Figs. 1 and 2, put in evidence with your fourteenth answer, and to have had two transmitting reeds and two receiving reeds, each of the two transmitting reeds being vibrated by its own local battery, and the circuit being made and broken at every vibration of either of the transmitting reeds: was this so?

Ans. The experiment is not completely described in the question. The instruments were substantially like those shown in Figs. 11 and 12, and the arrangement upon the circuit is shown in Fig. 2, excepting that during the course of the experiments a single receiver was placed in the circuit instead of two receivers, as shown

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in Fig. 2. The batteries also only formed local batteries when the keys were raised. When the keys were depressed, the batteries were introduced into the main circuit, and then formed a single battery divided into two parts, arranged for quantity. The receiving instrument, from which two musical tones were audible was similar to that shown in Fig. 3. Otherwise than this, the description in the question is correct.

Cross-Int. 193. It appears by the record of the harmonic multiple telegraph interference between you and Mr. Gray, that you prepared a caveat, sworn to Oct. 27, 1874: did you in that caveat describe or suggest the use of a common receiver of several different simultaneously transmitted tones; if so, will you quote the passage?

Ans. I did not.

Cross-Int. 194. You described in this caveat the apparatus you had used in November, 1873, as before referred to, in your answer to Int. 19, did you not?

Ans. I did.

Cross-Int. 195. In the printed record of your deposition in the multiple-telegraph interference case, you say after obtaining Mr. Sanders's pecuniary assistance, "we were advised to take out a caveat to protect the inventions during the period of having apparatus constructed for the purpose of applying for Letters Patent," and that Mr. Sanders's pecuniary assistance had been volunteered for the purpose of your obtaining Letters Patent for your inventions in the United States (I refer to your seventeenth and eighteenth answers in that interference): these things so stated were true, I suppose?

Ans. They were.

Cross-Int. 196. There appears in the same interference record what purports to be a copy of a letter from you to Mr. Gardiner G. Hubbard, dated Nov. 26, 1874: will you refer to the printed matter I refer to, and say whether it is a true copy of a letter written by you to him at that date?

Ans. It is.

[*The counsel for the defendant puts in evidence a copy of the printed letter of Nov.* 26, 1874, *just referred to, and it is marked* "*Defendant's Exhibit Bell Letter to Hubbard, Nov.* 26, 1874, *W. P.*

Preble, Jr., Examiner"; also a copy of the Bell caveat of Oct. 27, 1874, *as printed in said interference record, and it is marked " Defendant's Exhibit Bell Caveat, W. P. Preble, Jr , Examiner."*]

Cross-Int. 197. In the same interference record I find printed what is entitled a " caveat supplement": please look at it, and see whether that is a true copy of a paper prepared by you as a supplement to your caveat of October, 1874.

Ans. It is a true copy of a portion of the original caveat. At the time my deposition was first taken in the harmonic multiple telegraph interference, I was unable to produce this portion of the caveat, but it was subsequently found and put into the case.

Cross-Int. 198. When did you first furnish to any one a description of, or make a drawing of, or make a model of an apparatus in which a single plate of inductive metal was used for a transmitter and a single plate of inductive metal used for a receiver, the construction being such that the vibrations of the air produced by the human voice, directed against either of such plates, would be reproduced audibly by the other plate, so that the transmitting plate could be used to receive or the receiving plate to transmit, the operation being what is known as reciprocal transmission? Observe, I do not ask you when you conceived of it, but when, as matter of fact, you furnished to any one a description or made a drawing or made a model of it.

Ans. I furnished a description of such an apparatus for reciprocal transmission, in which the inductive plate was to be attached to a membrane, to Mr. Thomas A. Watson, on the 2d of June, 1875. Models were made soon afterwards.

Cross-Int. 199. Do you refer to the two telephones like those shown in your patent of 1876, having at each end of the line a hinged armature vibrated by a membrane?

Ans. I refer to the two telephones described in my seventy-fourth and eighty-fourth answers, substantially like those shown in Fig. 7 of my patent, having membranes carrying hinged armatures.

Cross-Int. 200. I did not intend to include in my question that construction. I meant to inquire as to a construction in which the inductive plate at each end of the line received the vibrations of the air directly, or in which such vibrations were received upon a membrane carrying as part thereof a piece or patch of inductive metal, as in the case of the membrane transmitter used at the Centennial.

Ans. I cannot give the exact date when such a construction of apparatus was first described or put into a drawing or model. I simply remember that it was not long after the granting of my patent of March 7, 1876; I think about the end of March or early in April, 1876.

Cross-Int. 201. Do you understand that you have put in evidence already the description or drawing or model to which you now refer?

Ans. I am not certain whether one of the models put in evidence, Exhibit 28, was not made about that time, and is the original. I think it is; and the other models, Exhibits 26 and 27, though not the identical instruments used at that time, are substantially similar to them. I think the earliest description put in evidence is to be found in paragraph 12, Exhibit 46, vol. ii., of the record.

Cross-Int. 202. In the case you are now speaking of, did you employ electro-magnets or permanent magnets?

Ans. Electro-magnets.

Cross-Int. 203. I understand you to have testified that in an experiment on or about June 2, 1875, you noticed that by the vibration of a tuned reed within the magnetic field of an electro-magnet, which was not at the time under the influence of a battery, but which was not yet discharged, the tone of the reed was reproduced at the receiving end by virtue of the residual magnetism in the core of the electro-magnet: that is so, is it not?

Ans. It is; the residual magnetism of the core and reed. The latter was of steel, and probably retained a greater amount of magnetism than the electro-magnet.

Cross-Int. 204. When did you first furnish to any one a description, or make a drawing, or make a model of an apparatus in which permanent magnets were used instead of electro-magnets (no battery being employed), the undulations being thrown upon the line wire by the vibration of inductive plates within the field of the permanent magnets?

Ans. I furnished a drawing of such an arrangement within a few days after the 27th of October, 1874. I described such an arrangement previously to that date in Canada, at my father's house. The drawing referred to has been put in evidence in my forty-ninth answer, and is marked "Exhibit 18, Fig. 2," and is described in my forty-eighth answer.

Cross-Int. 205. Does this forty-eighth answer describe an apparatus in which a permanent magnet and an inductive plate are employed at each end of a line wire, for the purpose of the electrical transmission of the vibrations of the plates?

Ans. It does describe such an apparatus, more than one plate being used at each end of the circuit.

Cross-Int. 206. Do you mean that an arrangement of permanent magnets, such as is shown in Fig. 2 of Exhibit 18, was intended to be used at each end of the circuit?

Ans. Yes.

Cross-Int. 207. My Int. 204 was intended to inquire when you first furnished to any one a description, or made a drawing, or made a model of an apparatus in which a permanent magnet was used instead of the electro magnet at each end of the circuit, the undulations being thrown upon the line wire by the vibration of an inductive plate within the field of the permanent magnet at the transmitting end, and producing corresponding vibrations in the corresponding inductive plate vibrating within the field of the permanent magnet at the receiving end: will you tell me?

Ans. I think the question is fairly answered by reference to this same drawing, Figs. 1 and 2, Exhibit 18. The mode of operation of the apparatus shown was presumed to be as follows: Upon vibrating one of the polarized reeds, shown in plan in Fig. 1 and in section in Fig. 2, a magneto-electric current would be generated in the coils surrounding the permanent magnets N S, N S, Fig. 2; and this magneto-electro current, passed through the coils of a similar apparatus at the other end of the circuit, would occasion the forcible vibration of that reed at the receiving station which was in unison with it.

Cross-Int. 208. You did not notice that my question was limited to an apparatus in which *a* permanent magnet was used instead of the electro-magnet at each end of the circuit, and did not embrace in its terms an apparatus in which a pair of permanent magnets was used at each end in the manner and for the purpose which you have been describing; with that explanation, please answer the question.

Ans. I must again refer to the same drawing, Exhibit 18. I described to Dr. Blake the effect of vibrating a polarized plate like those shown in this drawing in front of a permanent magnet, the poles of which were surrounded by coils of insulated wire. I drew such an arrangement and added on another permanent magnet arranged in the same way, to show him how the effect of the vibration could be increased by using a pair of magnets instead of a single one. The completed drawing is that shown in Fig. 2, Exhibit 18.

Cross-Int. 209. You are speaking, I suppose, of the same thing you described in your answer to the forty-eighth question?

Ans. I am.

Cross-Int. 210. Now please tell me when you first had an apparatus in which a single permanent magnet, with a single inductive plate vibrating in its field, was used or to be used at each end of the circuit.

Ans. I do not know. I know that I used such an apparatus early in July, 1876, and although I cannot now recall the use of any such apparatus at an earlier date, I feel confident that I must have tried it before.

Cross-Int. 211. You mean by your last answer that you know you used, early in July, 1876, an apparatus having a single permanent magnet, with a single inductive plate vibrating in its field at each end of the circuit, and using no battery?

Ans. I cannot be certain whether such an apparatus was used at each end of the circuit, but I am certain that such an apparatus was used as a transmitting and receiving telephone without any battery upon the circuit early in July, 1876, and the permanent magnet used has been placed in evidence in my one hundred and sixty-third answer, and marked "Exhibit 31."

Cross-Int. 212. When you say that you are "certain" that such an apparatus was used as a transmitting and receiving telephone, do you mean that the same permanent magnet and vibrating plate (the magnet being Exhibit 31) were used first to transmit and then to receive?

Ans. I do.

Cross-Int. 213. Now please name the earliest time when you are certain that a permanent magnet and vibrating plate at each end of the circuit was used or constructed for use by or for you, no battery being employed.

Ans. About the end of October, 1876. I am sure such an arrangement was used by me at a very much earlier date, although I cannot now recall the details or the date.

Cross-Int. 214. How do you explain this language, which I find in your preliminary statement, made under oath in the speaking-telephone interferences I and J, such statement being sworn to Nov. 20, 1878: "In the latter part of November, 1876, I dispensed altogether with the use of a battery in my working instrument, and used permanent magnets and metal diaphragms in both my transmitting and receiving instruments, the instruments being duplicates of each other"? This appears to me to be inconsistent with the statement you now make, that about the end of October, or much earlier, you had in use an apparatus with a permanent magnet and vibrating plate at each end of the circuit, and no battery. How do you reconcile them?

Ans. The passage in the preliminary statement refers to the time when I relinquished the use of a battery entirely in my experiments, and had permanently adopted the permanent magnet as a substitute. Previously to that time I had been using experimentally sometimes permanent magnets, sometimes batteries.

Cross-Int. 215 (*de bene*). In your letter dated Nov. 12, 1876, put in evidence in your one hundred and sixty fourth answer, you say, "This evening we have made another discovery of a very important kind, which will lead to the reduction of battery required, or to the omission of batteries altogether": what was that important discovery which you made in the evening of Nov. 12, 1876?

Ans. The discovery that a permanent magnet telephone could be practically used on a real line of considerable resistance without any battery on the circuit. I had been using permanent magnet telephones before in laboratory experiments; but this, I believe, was the first time I had practically tested such instruments upon a real telegraph line, although I had constructed an instrument in July, 1876, intended to be used in attempting to transmit speech between Boston and Philadelphia, if the judges of the Centennial Exhibition had called for the experiment. The magnet of that instrument has already been referred to, and has been put in evidence as Exhibit 43.

Cross-Int. 216. I wish now to read you the sentence just quoted from your letter of Nov. 12, 1876, in connection with the sentence next preceding, the whole being as follows: "We cut out the battery, and could distinctly hear the tones of Mr. Watson's voice singing one of Moody and Sankey's hymns, without any battery at all. This evening we have made *another* discovery of a very important kind, which will lead to the reduction of the battery required or to the omission of batteries altogether." Do you still say that what is referred to as "another discovery" was the discovery that the magneto-electric impulse alone, without a battery, could be transmitted over a long line?

Ans. I said that the discovery was that a "permanent magnet telephone" could be practically used on a real line of considerable resistance. The first sentence quoted referred to an experiment without a battery, in which the magnets used were ordinary electro-magnets, which retained some residual magnetism. The latter sentence refers to an experiment in which a permanent magnet telephone was used, and the results were so much better than in the first experiment as to convince me that such telephones could be practically used upon real lines.

Cross-Int. 217. When I represented you in my last question as having said that what was referred to as "another discovery" was the discovery that the magneto-electric impulse alone, without a battery, could be transmitted over a long line, I did not observe that you had (properly, of course) struck out from your two hundred and fourteenth answer these words which fell from your lips, and were at first recorded with your answer: "And it took much time and many experiments to disabuse my mind of the idea that had been in my way from my first conception of the magneto-electric speaking telephone in 1874 up to that time; namely, that the currents generated in such an apparatus, without a battery, would be too feeble for practical use upon real lines." It is true, is it not, that you had been under that impression?

Ans. It is true that I was fully under that impression up to July, 1876. I then began to doubt whether I had not been mistaken in this idea. Subsequent laboratory experiments served to strengthen the doubt, and the experiment referred to demonstrated that permanent magnet telephones could be practically used on real lines.

Cross-Int. 218. You mean the experiment of Sunday, Nov. 12, 1876, between Boston and Cambridge?

Ans. I do, although I believed that other experiments previously made, but not on real lines, had demonstrated this point.

Cross-Int. 219. Did you actually use a permanent magnet at each end of the line, in place of the electro-magnets and without a battery, in the experiment between Boston and Cambridge on Sunday, Nov. 12, 1876?

Ans. I am not sure; my impression is that a permanent magnet telephone was used at one end and an electro-magnet telephone at the other. I may, however, be mistaken in this, and it is quite possible that permanent magnet telephones were used at both ends.

Cross-Int. 220. Are you quite sure that a permanent magnet telephone was used at either end of the line in that experiment of Sunday, Nov. 12, 1876?

Ans. I am quite sure that a permanent magnet telephone was used at the Boston end.

[*Adjourned to July* 12, 1879, *at* 2.30 *P. M.*]

BOSTON, July 23, 1879.

Cross-Int. 221. Referring now to your twenty-first and twenty-second answers, in which you say that in the winter of 1873, you think about December, you arranged your multiple telegraph instruments with an induction coil placed between the interrupter and the receiver, and produce three drawings, Figs. 4, 5 and 6, which are copied at page 114 of the record, representing such arrangements and a modification of them: I will ask you to explain briefly the operation of what is shown in these drawings, first in Figs. 4 and 5 and afterwards as modified in Fig. 6.

Ans. Figs. 4 and 5 represent the arrangement devised in the winter of 1873. At each station shown in Fig. 4 an interrupter is placed in the primary circuit of an induction coil with a local battery. The secondary circuit of each coil is normally short-circuited by a telegraph key. The depression of the key causes the secondary circuit of the coil to form a portion of the main current, and the impulses induced in the secondary coil by the operation of the interrupter in the primary circuit are thus caused to traverse the main circuit, passing through the coils of all the receiving instruments, and causing the forcible vibration of the armatures of such of those receivers whose rates of vibration correspond to that of the armature of the interrupter in the primary circuit. The instruments are so arranged that the depression of any key causes the forcible vibration of one and one only of the receiving instruments at each station, producing from it a loud musical tone, the duration of which depends upon the length of time the telegraph key is kept depressed. Thus the operation of any telegraph key in the ordinary manner to transmit a telegraph message by the Morse system causes a succession of loud musical tones from one of the receivers at each station, the duration of each sound corresponding to the dot or dash of the Morse alphabet, so that the message transmitted could be read by any skilled Morse operator listening to the receiving instrument. At each station the interrupters used were to have different rates of vibration, and the receivers at each station corresponded respectively to the interrupters in their normal rate of vibration. The advantage derived by the multiple arrangement of interrupters and receivers was that more than one telegraphic message could be transmitted and received simultaneously without confusion. It was only necessary that the messages should be transmitted by means of interrupters having different rates of vibration, the signals from the interrupters affecting different receivers at each station.

The arrangement shown in Fig. 5 illustrates a plan of doubling the carrying capacity of the wire under the harmonic multiple telegraphic system shown in Fig. 4. The current from an interrupter is shown in Fig. 5 to be divided between two induction coils, one portion of the intermittent current passing through the primary circuit of one of the coils, the other portion through the primary circuit of the other. The secondary circuit of one of the coils (which is here-designated as the primary induction coil) forms a portion of the main circuit, and the currents induced in it traverse the coils of the receiving instruments shown, which represent one receiver at the same station and another at a distant station, both corresponding in rate of vibration to that of the interrupter shown. The secondary circuit of what is here termed the secondary induction coil is connected with coils passing around the magnet of the receiving instrument at the same station, the wires being so connected that the induced currents from the secondary induction coil oppose those from the primary induction coil in the receiving instrument. Resistance is inserted at R, so as to make the currents from the secondary induction coil just powerful enough to neutralize the effect of the primary induction coil upon the receiving instrument at that station. Thus any signals sent by means of the interrupter shown in Fig. 5 would affect corresponding receivers at distant stations, but would not affect the corresponding receiver at its own station. But that receiver would be affected by impulses transmitted from a corresponding interrupter of a distant station; and thus, while the operator at the station shown in Fig. 5 could be sending a message by means of the transmitter shown, another operator at that same station could be receiving a different telegraphic message from a distant station, sent by the operation of an interrupter of similar rate of vibration to that operated at his own station. I propose to duplex each interrupter and corresponding receiver, as shown in this diagram, at each station.

In Fig. 6 is shown a modification of the plan shown in Fig. 4, in which a common induction coil is used at each station for all the interrupters and receivers. The secondary wires of the coil are permanently in circuit with the main line, but a switch or "cut-off" is arranged, by means of which the secondary coil may be short-circuited when the interrupters are not in use, so as to reduce the resistance of the main line. A single battery is employed to work all the interrupters at each station, and the depression of any key causes the current from any interrupter to pass through the primary circuit of the induction coil, and thus causes secondary impulses to appear upon the main line, occasioning the forcible vibration of the proper receiver at each station, and the audible production of the proper musical signal.

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Cross-Int. 222. In your preliminary statement, sworn to May 8, 1876, in the multiple-telegraph interference, I find this passage: "I saw that one wire would suffice for communications simultaneously in both directions, if free earth communication could be secured at each end of the line. My first attempt to solve the problem was by the application of artificial resistance, as shown in Fig. 10. When the line was put to earth at the two extremities of the circuit A and N, any intermediate station (C) could cause half the intermittent current from its battery to pass to earth at A and the other half to the earth at N, by putting sufficient resistance on the shorter circuit. Study of the arrangement, however, convinced me that the problem could not be solved by any arrangement of artificial resistances, and I was for a time at a loss how to overcome the difficulty. Early in December, 1873, it flashed across me that the intermittent current might be induced upon the line wire, in which case there would be no difficulty in having free earth communication at both ends of the circuit. The arrangement, as conceived, is shown in Fig. 11. I saw also that the duplex principle could be applied, as in Fig. 12, so as to double the number of messages possible upon the acoustical plan." Does this passage refer to the same arrangement for inducing the intermittent current upon the line wire that you describe in your last answer?

Ans. A portion of it does, the part referring to Figs. 11 and 12. Figs. 4 and 5, on page 114 of the record, are reproductions of these.

Cross-Int. 223. When were these figures, as put in with the preliminary statement and as there designated Figs. 11 and 12, made?

Ans. They were drawn somewhere about the 27th of April, 1876, for my preliminary statement in the harmonic-telegraph interference; but similar drawings were made a very long time before that date, — certainly in January, 1874, if not earlier.

Cross-Int. 224. I understand you to say in effect that drawings such as Figs. 4 and 5, page 114 of the record, were made at or shortly after your conception in December, 1873, of the arrangement which such drawings show for inducing the intermittent current upon the line wire, and for the application of the duplex system.

Ans. I do. Of course I cannot be sure that the drawings were identical in every particular as to form of apparatus, etc.; but I am sure that drawings were made at that time substantially similar to those in Figs. 4 and 5 of the record in arrangement upon circuit, and in every particular essential to the conceptions described in my two hundred and twenty-first answer.

Cross-Int. 225. Did you practically try the arrangement which you so conceived in December, 1873, for inducing the intermittent current on the line wire?

Ans. I did not at that time.

Cross-Int. 226. At what time did you?

Ans. I made numerous experiments with induction coils in the winter of 1874–75, but I cannot be certain that the full arrangement of circuit shown in Fig. 4 was tried, but I believe it was. I at all events remember experimenting with a single induction coil, having an interrupter and receivers arranged as in Fig. 4; and I remember changing the interrupter, substituting for it an interrupter of different rate of vibration. The point I am uncertain about is as to whether a number of induction coils were used, as in Fig. 4. The arrangement shown in Fig. 5 was not tried. I cannot fix the dates of these experiments otherwise than the winter of 1874–75. They might have been as early as the 1st of November, 1874.

Cross-Int. 227. Going back for a moment to the drawings or sketches which were made (similar to Figs. 4 and 5) in or shortly after December, 1873, when you conceived the idea of inducing the intermittent current on the line wire, did you preserve these sketches up to the time of preparing your caveat with similar ones, in October, 1874, or did you make the caveat sketches in October, 1874, from memory of the original ones or of the device which they were made to represent?

Ans. The drawings for my caveat were made some of them from memory, others from memoranda that had been made at an earlier time; but whether the particular drawings referred to were made from memory or from the original sketches, I do not now remember. Numerous sketches had been preserved that were made in January, 1874, but I cannot now remember whether these were among the number; my impression is that they were.

Cross-Int. 228. I suppose the original sketches which I inquired about are not now in existence?

Ans. I do not know. When my deposition was taken in the harmonic-telegraph interference, some original sketches made in the winter of 1873–74 were put in evidence, and I presume have been preserved. Others were not put in evidence, and I do not know what has become of them. It is probable they are still in existence, but I have not found any among my memoranda. I cannot say at the present moment whether the original sketches referred to were put in evidence in the harmonic-telegraph interference case or not.

Cross-Int. 229. After the experiments were tried in the winter of 1874–75 which you have mentioned, what did you ever do with a view to the practical trial of the arrangement you had conceived for inducing the intermittent current on the line wire, or for any use of the induction coil between the interrupter and the receiver?

Ans. I satisfied myself by practical experiment that an induction coil could be practically used, but my difficulty was to get interrupters so tuned as not to interfere with one another's action. A great portion of my time from February, 1875, to June, 1875, was taken up in experiments to overcome this difficulty.

Cross-Int. 230. With what result?

Ans. The experiments led me to the discovery made on the 2d of June, 1875, which has been described at length in my deposition.

Cross-Int. 231. Please now briefly describe that discovery again.

Ans. The discovery was that the magneto-electric current produced by the vibration of a steel reed or of a permanent magnet, in front of an electro-magnet, was sufficiently powerful to be utilized for the production of sounds by electric means.

Cross-Int. 232. And this discovery enabled you to induce currents as desired in a primary circuit, did it?

Ans. It did.

Cross-Int. 233. Did you at any time after that make any practical trials in reference to the use of an induction coil for inducing currents upon the line wire?

Ans. I did; many.

Cross-Int. 234. For what purpose and with what result?

Ans. For the purposes of multiple telegraphy. I found that the currents induced in the secondary circuit of an induction coil by the action of an interrupter in the primary circuit occasioned a much more powerful vibration of the tuned reeds of my harmonic receivers than the magneto-electric currents I was then able to produce.

Cross-Int. 235. Did you, in consequence of this observation, apply to practical use the induction coil with a secondary circuit?

Ans. I did not. I kept it in view in experiments relating to multiple telegraphy, but I believed that the magneto-electric currents possessed many advantages for this purpose if the strength of the magneto currents could be increased, and that they could be used in addition for the transmission of articulate speech electrically; and I therefore devoted most of my time to ascertaining the conditions under which the most powerful magneto currents were produced.

Cross-Int. 236. And in that direction you met with satisfactory success, did you not?

Ans. I met with encouraging success in this direction.

Cross-Int. 237. And at last with satisfactory success?

Ans. I did.

Cross-Int. 238. Did you ever describe or show in any patent of yours, in this country or abroad, the use of an induction coil for the purpose of inducing a current upon the line wire?

Ans. I did; in my English patent of Dec. 9, 1876, and in an application for a United States patent, filed March 10, 1875, and also referred to in defendant's Exhibit A, being an application of Feb 25, 1875, where I say, "A single wire for communication in both directions may be used. This will necessitate the employment of an induced current, and in this case the duplex principle can be applied to my system. The arrangement of apparatus for this purpose I do not, however, here describe, inasmuch as I make it the subject of separate application for Letters Patent."

Cross-Int. 239. Did this "separate application" proceed to patent, or was it stopped by interference; and if so, with what?

Ans. It was stopped by interference with an application or applications of Mr. Elisha Gray, and the interference has not yet been decided.

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Cross-Int. 240. I hand you a printed copy of an American application for a patent by yourself, filed March 10, 1875, and ask you whether that is the "separate application" above referred to.

Ans. It is.

Cross-Int. 241. To identify the application just shown you, I will ask you if it contains the following from the preamble and the claim: "My present invention is directed to the adaptation of the system aforesaid to an *induced* current, whereby messages can be sent in both directions along a single line wire. To effect the transmission along the line wire of a succession of secondary or induced electrical impulses, I find it to be necessary that the successive and alternate makes and breaks of the primary circuit should be of equal and uniform duration. . . . What I claim and desire to secure by Letters Patent is, in a system of telegraphy in which the receiver is put in vibration by electrical impulses sent along the line wire from the transmitting station, as described, I claim the employment at the transmitting station, in connection with the line wire and an induction coil, of a primary circuit [and] apparatus for making and breaking said circuit a definite number of times per second or other unit of time, with makes and breaks of equal duration, substantially in the manner described, so that the positive and negative impulses thereby induced in the line wire shall succeed each other at equal intervals of time"?

Ans. It does.

Cross-Int. 242. Was this application of yours put in interference with the then pending application of Gray, filed June 27, 1874, on page 582 of Vol. II. of the printed record, and on which he obtained, July 27, 1875, his patent No. 166,095; or with the then pending application of Mr. Gray, filed April 18, 1874, on which he obtained a patent July 27, 1875, No. 166,096, which is found on page 621, Vol. II., of the printed record?

[*Objected to as immaterial and incompetent.*]

Ans. I do not know.

Cross-Int. 243. Do both of the patents of Mr. Gray to which I just referred, and for which his applications were pending in March, 1875, show a primary circuit and a secondary circuit, currents being induced in the secondary by an induction coil?

Ans. They do show a primary and secondary circuit, currents being induced in the secondary circuit by the rapid interruption of the primary circuit.

Cross-Int. 244. In your preliminary statement in the multiple-telegraph interference, I find these passages: "During the summer of 1874, doubts occurred as to the operation of the induced current. When the primary circuit of an induction coil is closed, a momentary impulse of positive electricity is induced upon the secondary circuit, and when it is opened, an impulse of negative electricity appears upon the wire. I feared that the induced current would be insufficient to set the armatures of the receiving instruments in operation, unless the negative impulses came exactly midway between the positive impulses, and unless the armatures of the receiving instruments were rendered permanently magnetic, so as to be alternately attracted and repelled by their electro-magnets. The thought occurred of inducing the impulses by means of a permanent magnet instead of a battery.

"Reflection convinced me that however feasible the scheme looked upon paper, it was impracticable, as the induced currents would be far too feeble to overcome any great resistance. For the same reason, the plan shown in Fig. 15 seemed impracticable save in theory, and I began to look about for some other method of inducing alternate positive and negative impulses, which should succeed each other at equal intervals of time, and at last I hit upon the plan of making and breaking contact by means of a revolving cylinder, as shown in Fig. 17. In the autumn of 1874, Mr. Thomas Sanders, of Haverhill, Mass., offered to assist me in obtaining patents. It was decided to file a caveat," etc.

Was the "plan of making and breaking contact by means of a revolving cylinder, as shown in Fig. 17," an apparatus similar to that mentioned in the claim of your application of March 10, 1875, for making and breaking the circuit a definite number of times per second, or other unit of time, with makes and breaks of equal duration; if not, how did it differ substantially from it?

Ans. It was such an apparatus. I should like to remark in reference to the first part of the question, that the scheme which I stated appeared to me in the summer of 1874 as "impracticable,"

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on account of the supposed feebleness of the induced currents, referred to my method of inducing currents by the vibration of magnetized reeds, and did not refer to the currents induced by an induction coil and battery alluded to in the first part of the quotation.

Cross-Int. 245. I will ask your attention again to the subject of the experiment in which, being engaged in the transmission of the tones of two tuned transmitting reeds, for the purpose of vibrating two correspondingly tuned receiving reeds, you observed that the tones of both the transmitting reeds were audible from one of the receiving reeds, which happened to be out of tune with its mate: did you satisfy yourself at that time that the sound of two transmitted notes which you heard did not proceed from the core of the magnet? I refer to the experiment of November, 1873, mentioned in your nineteenth answer.

Ans. I did not. The idea did not occur to me under the circumstances of the experiment; for I felt the trembling of the armature with my finger, and I did not know at that time that a sound was produced by a core under the circumstances of the experiment.

Cross-Int. 246. Did you ever satisfy yourself on that point, either as to that experiment or as to any subsequent one conducted under exactly similar conditions?

Ans. I did.

Cross-Int. 247. Will you describe how you so satisfied yourself and when it was, and state the circumstances?

Ans. In November, 1874, I discovered that a sound proceeded from the core of an electro-magnet which was placed in circuit with a current interrupter, and shortly afterwards I compared the sound produced in this manner with the sound produced from a reed subjected to the attraction of that same electro-magnet. I cannot recall the details of any particular experiment made to test this point, but can give the general results of a number of experiments made during the winter of 1874–75, which satisfied me upon the point alluded to. I found that a musical tone was audible upon placing the ear in close contact with the reed when it was held at a considerable distance from the pole of the electro-magnet, but still within its field. Upon gradually bringing the reed nearer to the magnet the loudness of the sound increased, but upon touching the pole of the magnet the sound changed its character altogether. It was much feebler and different in quality. It was also noticed that the sound audible from the core of the magnet when the reed was removed was materially different in quality from that heard from the reed when it was held a short distance from the pole. The sound audible from the core partook more of the nature of a *noise* than a musical note, and was accompanied by a curious crackling effect; while that heard from the reed had more of a musical quality about it, and no crackling effect accompanied it.

Cross-Int. 248 (*de bene*). In your letter of March 18, 1875, put in evidence with your fifty-seventh answer, you speak of telling Prof. Henry "that on passing a current of intermittent electricity through an empty helix of insulated copper wire, a noise could be heard proceeding from the coil similar to that heard proceeding from the telephone": did you never afterwards learn that that fact had been observed already by some one before you?

Ans. I did. I found that this fact had been discovered by De la Rive. It is referred to in a paper by him in the *Annales de Chimie et de Physique*, 3d series, Vol. XVI. page 104.

Cross-Int. 249 (*de bene*). In this same letter you speak of an exhibition which you made shortly before the date of the letter at the office of the Western Union Company, in New York: do you mean to be understood by what you say in the letter on that subject, that Messrs. Orton and Prescott received what you then communicated to them as new and valuable in comparison with what they already knew?

Ans. Such was the impression I derived from my conversations with them.

Cross-Int. 250. Will you state any particular thing which Mr. Prescott said, or which Mr. Orton said in his presence, that gave you this impression?

Ans. Mr. Prescott devoted a considerable portion of his time to questioning me concerning the details of my scheme of harmonic multiple telegraphy, and seemed much interested in the subject on the occasion of my first visit to the Western Union office; and on the occasion of my second visit, which was next day, I requested the

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return of the apparatus which I had left at the office, for the purpose of exhibiting the same to the president of the Atlantic and Pacific Telegraph Company. Mr. Prescott seemed much disturbed at this, and requested me to wait while he talked with Mr. Orton concerning the matter. I did so. Mr. Prescott was gone a very long time, — my impression is about an hour; and when he returned, he stated that Mr. Orton was anxious to see me upon the subject. I thereupon saw Mr. Orton, and had some conversation with him, which I do not give, as it was not in Mr. Prescott's presence, and I understand is not called for by the question. I left my instruments at the Western Union office, where I presume they are now. I do not remember any particular remark made by Mr. Prescott that gave me the impression that he considered my invention novel and valuable, but his whole conduct and manner referred to above led me to believe so.

[*Adjourned to July* 24, 1879, *at* 10 *A. M.*]

BOSTON, July 24, 1879.

Cross-Int. 251. There is in the record, at page 150,* a letter of yours to Mr. Gray, dated March 2, 1877, in which you say, "I do not know the nature of the application for a caveat to which you have referred as having been filed two hours after my application for a patent, except that it had something to do with the vibration of a wire in water," etc.: how did you come to know as much as that about the nature of a paper in the confidential archives of the Patent Office?

Ans. When I found that my application was in interference with some other application filed in the Patent Office, I went to Washington to examine into the matter, for I understood that an applicant in interference had a right to see that portion of the interfering application which conflicted with his invention. I therefore went to the Patent Office and requested the examiner to explain to me the exact points of interference between my application and the other. I found that there had been two interferences declared with my application. The first was with a caveat filed the same day as my application, and had already been dissolved. The examiner declined to show me the caveat, as it was a confidential document, but he indicated to me the particular clause in my application with which it had conflicted. I therefore knew it had something to do with the vibration of a wire in a liquid. I do not now remember what it was that led me to suppose that that liquid was water.

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* The reference is to the printed record in the suit *Bell Telephone Company* v. *Dowd.*

Cross-Int. 252. You mean to be understood, I suppose, that you did not see either the description or the drawings making part of that caveat, or any part of that description or the drawings?

Ans. I do.

Cross-Int. 253. I understand that when you speak of the examiner's indicating to you what part of your application it was that interfered with the caveat, you speak of an indication given by him in conversation with you and not by official letter: am I right?

Ans. Yes; he simply pointed to a clause in my application and stated that the caveat had interfered with that.

Cross-Int. 254. Was the clause which he pointed to one of the claims of your application, or some passage in the body of the application?

Ans. A passage in the body of the application.

Cross-Int. 255. Please read the passage that he pointed to, telling you that that was the passage where the interference lay.

Ans. "Electrical undulations may also be caused by alternately increasing and diminishing the resistance of the circuit, or by alternately increasing and diminishing the power of the battery. The internal resistance of a battery is diminished by bringing the voltaic elements nearer together, and increased by placing them further apart. The reciprocal vibration of the elements of a battery occasions an undulatory action in the voltaic current. The external resistance may also be varied; for instance, let mercury, or some other liquid, form part of a voltaic circuit, then the more deeply the conducting wire is immersed in the mercury or other liquid the less resistance does the liquid offer to the passage of the current; hence the vibration of a conducting wire in mercury or other liquid, included in the circuit, occasions undulations in the current. The vertical vibration of the elements of a battery in the liquid in which they

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are immersed produces an undulatory action in the current by alternately increasing and diminishing the power of the battery."

The examiner indicated the clause just quoted as the passage where the interference lay. I do not remember whether he pointed to any particular sentence in this clause or not. My impression is that I asked the examiner whether the point was the "vibration of the conducting wire in mercury or other liquid." At all events, I carried away the impression that this had been the point at issue.

Cross-Int. 256. Who was the examiner; was it Mr. Wilbur?

Ans. I do not know. I think it was Mr. Wilbur, but I am not perfectly certain.

Cross-Int. 257. In your answer to Int. 73, you say that on the 2d of June, 1875, you attempted to generate magneto-electric currents by vibrating a regular permanent steel magnet in front of a soft-iron core wound with coils of wire, there being no battery on the circuit: did the apparatus you used consist in a permanet magnet formed like a tuning fork and set in vibration by a blow, like a tuning fork, and held near the core so that the vibrations would induce currents upon the line?

Ans. It did.

[*By agreement of counsel, the whole of the provisional specification and drawings of Mr. Bell's English patent, dated Dec.* 9, 1876, *is put in, and marked* "*Complainants' Exhibit* 32, *Bell's English Provisional Specification,*" *instead of the extract from it put in after Mr. Bell's one hundred and sixty-sixth answer, page* 168 *of the record.*]

Cross-Int. 258. Does your preliminary statement in the speaking-telephone interference, sworn to Nov. 20, 1878, contain the following: "Another instrument with stretched membrane was immediately constructed, and the experiment spoken of in said letter was tried of transmitting speech. One instrument was placed in my experimental room at the top of the building, and the other in the workshop below. I spoke from my room to Mr. Watson, and he spoke to me from below. I heard nothing, but Mr. Watson soon rushed up stairs, and said he could hear my voice but could not make out what I said. We then changed places, but with the same results. He heard my voice, but I could not hear his"?

Ans. It does.

Cross-Int. 259. The apparatus used in the experiment described in this quotation was the apparatus described in your patent of 1876, on which this suit is brought, and delineated in Fig. 7 of the drawings, was it not?

Ans. It was substantially similar.

Cross-Int. 260. Do you remember any difference between the apparatus used in that experiment and the apparatus described and shown in the patent?

Ans. I do. The transmitting and receiving cones shown in the patent were not employed. The armatures used in the experiment referred to were hinged to the uncovered leg of the magnet by a strip of leather. The coils used in the experiment were not specially adapted for use upon a line. I am not sure also whether any battery was used in the experiment.

Cross-Int. 261. Do you remember anything more in regard to the construction of that experimental instrument, either as to what it did contain and the patent does not, or to what it did not contain and the patent does?

Ans. The experimental instrument had an arrangement for straining the membrane and a framework for holding the magnet which are not shown in the patent.

Direct Examination resumed.

Int. 262. Please look at the quotation from your preliminary statement given in Int. 222; are the facts stated in that quotation true?

[*Objected to.*]

Ans. Yes.

Int. 263. Please look at the quotation contained in Cross-Int. 241, and state whether the "induced current," referred to in the quotation, is induced by a magneto-electric apparatus or by an induction coil, battery and circuit-breaker.

Ans. An induction coil, battery and circuit-breaker.

Int. 264. Please look at the two passages quoted in Cross-Int. 244, and produced to be put in evidence, all the paragraphs in which those quotations are found and all that intervene between them.

Ans. I produce them.

[*Complainants put in evidence said passages, and they are marked "Complainants' Exhibit* 34, *Extract Bell's Preliminary Statement in Harmonic Interference*."]

Int. 265. Please look at your Cross-Int. 193 and answer; state why you did not in your caveat of Oct. 27, 1874, describe or suggest the use of a common receiver of several different simultaneously transmitted tones.

[*Objected to.*]

Ans. Because it was not relevant to the subject matter of my invention, my object being to have a receiver which should respond markedly to one tone only.

Int. 266. Please look at Exhibit 18 and state whether any of the sketches in that exhibit, except Fig. 1 and Fig. 2, do or do not represent an apparatus in which the core of the electro-magnet was kept continuously polarized, when not under the influence of a battery, by induction from a permanent magnet.

Ans. Fig. 4 of Exhibit 18 shows such an apparatus.

Int. 267. Did your original idea of using permanently magnetized cores, around which to wind the coils in your telephones, contemplate the use of such polarized cores for the transmitters, or for the receivers, or for both?

[*Objected to.*]

Ans. For both.

Int. 268. What was the objection in your mind to that form of apparatus which led you at one time to prefer the use of a battery instead of depending upon permanent magnetization of the cores?

[*Objected to.*]

Ans. I thought at that time that the currents produced by the vibration of an armature in front of such core would be too feeble to produce practically useful results upon a line of any considerable resistance.

Int. 269. Did that difficulty in your mind relate to the use of polarized cores in the transmitter, or in the receiver, or both?

[*Objected to.*]

Ans. In the transmitter simply.

Int. 270. What difficulty occurred in your mind at that time in using the polarized core for an instrument intended merely for a receiver?

[*Objected to.*]

Ans. No difficulty. I thought at that time that a polarized core in the receiver made the instrument more sensitive.

Int. 271. What led you to entertain that opinion?

[*Objected to.*]

Ans. I understood at that time that the most sensitive telegraphic instruments were polarized relays in which such a core was employed.

Int. 272. What difficulty occurred to your mind as to the use of such an instrument at one end of a line over which reciprocal transmission — that is, transmission sometimes in one direction and sometimes in the other — was to take place?

[*Objected to.*]

Ans. I feared that when such an instrument was used as a transmitter by speaking to it, the currents produced by the action of the voice would be too feeble for practical purposes.

ALEXANDER GRAHAM BELL.

Attest: W. P. PREBLE, Jr., *Examiner*.

DEPOSITION OF THOMAS A. WATSON.

BOSTON, July 14, 1879.

Direct Examination by J. J. STORROW, Esq., *of Counsel for Complainants.*

Int. 1. Please state your name, age, residence, and occupation.

Ans. Thomas A. Watson; twenty-five; Boston, Mass.; general inspector of the National Bell Telephone Company.

Int. 2. When and how did you first become acquainted with Mr. A. G. Bell?

Ans. By making instruments for experimental purposes for him, in the winter of 1874–75, at Charles Williams, Jr.'s, manufactory, 109 Court Street, Boston.

Int. 3. What knowledge or experience had you then relating to electricity and electrical apparatus?

Ans. What I had gained by nearly two years' practical experience in Mr. Williams's manufactory, making electrical instruments, and also by study of various works on electricity and telegraphy.

Int. 4. During the winter of 1874-75 did Mr. Bell speak to you about any plans for the transmission of articulate speech; if so, what did he say to you about it, and how often did he speak to you upon the subject?

Ans. He did. On one occasion in January, 1875, he told me that he had plans by means of which he would cause a telegraph instrument to utter spoken words instead of making dots and dashes, and told me of an instrument he had devised for doing this. I do not remember how this instrument was to be constructed. At another time, within a month or two of the above date, he told me about an experiment he had made at Moses G. Farmer's laboratory, where he had connected a coil of wire in circuit with a galvanometer and moved a permanent magnet to and fro in front of the pole of the coil of wire, thereby causing the needle of the galvanometer to move from side to side as he moved the magnet.

Int. 5. Whether or not, during your connection with Mr. Bell, you assisted him in making experiments in addition to making apparatus?

Ans. I did.

Int. 6. Do you remember using with him tuned reed receivers, substantially like that shown in the figures of his eighteenth answer?

Ans. I do.

Int. 7. Did you ever hear from a single one of such receivers tones of different pitches transmitted by transmitters of different pitch? If so, state how you used the receivers, and whether you did this more than once, and state when you first did it.

Ans. I have heard such tones from one of these receivers, by pressing the reed against my ear. I did this many times during the winter of 1874–75; certainly earlier than the middle of February.

[*Adjourned to July* 15, 1879, *at* 10 *A. M.*]

BOSTON, July 15, 1879.

Int. 8. Do you remember the experiment at Mr. Fenollosa's music rooms in May, 1875? If so, describe it.

Ans. I do. We had a line run between Mr. Bell's laboratory in Salem and the music room in the next building. We arranged a current interrupter on the line in the laboratory and passed the intermittent current through the strings of a piano at the music room. I remained at the laboratory during the entire experiment. Mr. Bell was at the music room during the first part of the experiment, but came to the laboratory afterwards. He told me that he could not be sure whether he heard a musical note on the piano string or not. We then arranged a harmonic receiver on the line at the laboratory, and he directed some one at the music room to sound continuously one of the strings of the piano, while he listened at the receiving instrument. My impression is that the result of the second experiment was the same as the first. I do not think I was able to hear anything in the second experiment.

Int. 9. Do you remember the incident referred to by Mr. Bell in his deposition of your plucking a reed, and thereby causing a receiver to sound, on June 2, 1875? And if so, please describe it.

Ans. I do perfectly. I do not remember the details of the connection, but we had a number of current interrupters and harmonic receivers arranged in circuit. Mr. Bell had charge of one station in one room, and I was in charge of the other station in an adjoining room. One of the reeds at my station would not vibrate, and on telling Mr. Bell, he called out to me to pluck it, which was a common way we had of starting a reed if it would not vibrate. This produced some effect at Mr. Bell's station that caused considerable excitement in his mind, as he immediately asked me what I had done, and desired me to do it again, which I did. He then showed me that the effect of this plucking was to produce a slight vibration in the receiving instrument at his station without a battery. We then changed the arrangement of circuit and instruments, and tried it in various ways, getting the best results for two harmonic receivers in the same circuit with or without a battery.

Int. 10. Do you remember, at or about that time, vibrating a permanent magnet in front of the core of an electro-magnet? If so, describe that experiment and the results observed in it.

Ans. I do perfectly. We arranged an ordinary electro-magnet in circuit with a harmonic receiver and vibrated a horseshoe permanent magnet in front of the poles of the electro-magnet; and listening at the harmonic receiver, could hear the musical note of the permanent magnet loudly.

Int. 11. Please look at the permanent magnet now shown you, and which is the one produced by Mr. Bell in answer to Int. 73. State whether it is or is not the permanent magnet referred to in your last answer, and whether it is or is not in the same condition it was in when you so used it.

Ans. It is the identical magnet then used, but has since been mounted on a standard and painted.

Int. 12. When did Mr. Bell direct you to make the first membrane telephone you ever saw, and when did you make it?

Ans. June 2, 1875, the same day that the experiment noted in my ninth answer took place, and immediately after it. I think I completed the instrument the next day, but certainly within three days.

Int. 13. Describe the first experiment you tried with it.

Ans. We had a line running from the attic of Mr. Williams's factory to the third story. In the attic we connected to this line the membrane telephone. In the third story we connected a harmonic receiver. I shouted into the membrane telephone. Mr. Bell listened at the receiver. I think he heard nothing. We changed places. He shouted at the telephone and I listened at the receiver. I could hear a faint sound. We were not able to use the instrument but a very short time, as the membrane got torn. I do not remember whether there was a battery in circuit or not, but I think we tried it both with and without.

Int. 14. Did you afterwards make a second membrane instrument; and if so, when?

Ans. I did; some time during the following month or six weeks.

Int. 15. Do you remember trying two membrane telephones, using one instrument as a transmitter and the other as a receiver? If so, state where such experiment was made and the results obtained in it.

Ans. I do; the experiment was made on the line described in my thirteenth answer. I think the results were a slight improvement on what we had previously obtained. My recollection of this experiment is confused with those that preceded, extending through the month of June, 1875.

Int. 16. Did Mr. Bell, at any time during the month of July, state to you the practical results which he expected to obtain by the use of apparatus similar in principle to the membrane telephones you have just spoken of; and if so, what did he state on that subject?

Ans. Yes; he told me, on June 2, that he considered he had solved the problem of transmission of speech by the accidental discovery made on that day, of the effect produced by plucking the reed.

Int. 17. Did he, after the 2d of June, 1875, at any other time during that summer, speak to you of the practical results which would be obtained from the invention or discovery he had made; if so, how often did he speak to you about it?

Ans. During June and July we experimented together almost daily. He was always confident that by utilizing the June 2 discovery he could not only transmit speech telegraphically, but could overcome the difficulties that prevented the practical use of a harmonic telegraph which he had been working on for the previous six months with my assistance.

Int. 18. Please look at the articles now shown you, which are the same referred to in Mr. Bell's seventy-fourth and eighty-fourth answers, and state what they are.

Ans. They are portions of the first membrane telephones that I constructed for Mr. Bell. They are the base board and membrane rings of one, and the membrane rings of the other with the cross bar that supported the magnet, — an electro-magnet and an armature.

Int. 19. Were the changes which were made, if any, in the month of June, 1875, in the uncovered leg and armature of the electro-magnet of the first membrane telephone, correctly described in Mr. Bell's seventy-fourth answer? If not, state how your recollection differs from his, if at all.

Ans. They are correctly described in that answer.

Int. 20. Please look at the complainants' Exhibit 19 and 22, put in evidence in Mr. Bell's seventy-sixth and eighty-seventh answers. State whether they are or are not duplicates of the two original membrane telephones which you have spoken of and of which you have identified some of the parts. State also in what respects, if any, they differ from such original membrane telephones.

Ans. They are duplicates with the following exceptions: In Exhibit 19 the wooden framework is a little heavier, and the armature not so thick. In Exhibit 22 the framework is heavier, armature thinner, and a different method for adjusting the distance between the pole of the magnet and armature is supplied. In the original the adjustment was made by sliding the cross bar that supported the magnet up and down in the slots in the sides, as in Exhibit 19.

Int. 21. State how the armature Exhibit 21, and its mode of attachment to the pole of the magnet, compare with the armature and mode of attachment first used in the first telephone used in June, 1875.

Ans. I should say there is no essential difference. Exhibit 33 is about a sixteenth of an inch shorter, a thirty-second of an inch narrower, a thirty-second thicker, and the brass post by which it was attached to the membrane slightly longer and of greater diameter. The mode of attachment of the armature to the pole of the magnet is the same as used in that first experiment.

Int. 22. Please compare the armatures now on Exhibits 19 and 22 and their mode of attachment with the second armature which you put on to the membrane telephone of June 2, 1875, and described by Mr. Bell in his seventy-fourth answer.

Ans. The armatures of Exhibits 19 and 22 are a little thinner, and the armature is pivoted to the pole of the magnet instead of being hinged with leather.

Int. 23. Please look at complainants' Exhibits 20 and 23, and state whether they are correctly described in Mr. Bell's seventy-sixth and eighty-sixth answers.

Ans. They are correctly described in those answers.

Int. 24. Have you tried to transmit articulate speech with the instruments Exhibits 19, 20, 21, 22 and 23? If so, state when, where and how, and with what results.

Ans. I have. On Saturday, July 5, 1879, I tried the membrane telephones Exhibits 19 and 22 on a line between two parts of the building 40 State Street, with the circuits arranged as in Mr. Cross's third answer, using the sheepskin diaphragms Exhibits 20 and 23, and the heavy armatures Exhibit 21 and another one like it, which I now produce. I carried on conversation with Prof. Bell successfully, using three cells bichromate battery, the same that Mr. Cross described.

On Monday, July 7, I placed the instruments in circuit between the attic and third story of Mr. Williams's manufactory, under almost precisely the same conditions as the experiment of June 2, 1875. I could hear occasionally very faint sounds. The battery used was two large bichromate cells. We then carried the instruments to 40 State Street, and tested them again on the same circuit as on the 5th, with as good results as obtained that day. The experiments were made in the presence of Mr. Bell, Mr. Storrow, Mr. J. B. Henck, Jr., Dr. Clarence J. Blake and Mr. Berliner.

On the following Wednesday we tried the telephones at 40 State Street, with the goldbeater's skin diaphragms in place of the sheepskin diaphragms, and with thin clock-spring armatures, which are now on the exhibits. We succeeded in transmitting a few words, but I do not think the articulation was as distinct as with the thick diaphragms. The thin diaphragms also moistened and became flabby very quickly.

[*Complainants put in evidence the heavy armature produced by the witness, and it is marked* "*Complainants' Exhibit* 35, *Bell Telephone of* 1875, *Duplicate Heavy Armature.*"]

Int. 25. Please state how the results which you obtained in the trials just mentioned compare with the results obtained in the trials of June and July, 1875. If there is any difference, state what, in your opinion, is the cause of it.

Ans. In the experiment of July 7, 1879, at Mr. Williams's workshop, I do not think the results were any better, if as good, as those obtained in June or July, 1875; but the results obtained at 40 State Street, on July 5, 7 and 9, 1879, were decidedly better. The reason why the results were better at 40 State Street is, in my opinion, due to the fact that we were in a very quiet place, and that we were more practised in listening for faint sounds than in 1875.

Int. 26. Do you, in your experience, find that practice in the use of telephones enables a person to hear articulate speech from an instrument which without practice they cannot hear from? State what experience you have had on that subject.

Ans. In the experience derived from two years' work in practically introducing the telephone, I have found that it is almost invariably the case that a person listening to a telephone for the first time is unable to hear anything. The more powerful the transmitting instrument, the more readily do persons become expert in hearing the sound.

Int. 27. Whether or not you have found among persons who are not deaf, and who have had some practice in the use of telephones, any considerable difference in their ability to hear articulate speech from weak or imperfect telephones?

Ans. I have found a great difference.

Int. 28. Please look at the instrument now shown you; state who made it, what it was made for, and whether it was one of the instruments used in the experiments of June, 1875; and if so, state how it was then used.

Ans. I made it. It was made for a receiver for the harmonic telegraph that Mr. Bell was experimenting on during the winter of 1874–75. The whole of the instrument is not here: the reed and clamp are missing. It was used by clamping a reed on that pole of the electro-magnet to which the cross piece is attached, and allowing it to project over the other pole, but not in contact with it. The bobbin on the pole with the cross piece was put on in June, 1875, for the purpose of experimenting on the discovery made on the second day of that month.

Int. 29. How does it resemble the reed receivers which were used in the experiment of June 2, 1875, or that one which was used as a receiver with the first membrane telephone as a transmitter a few days afterward?

Ans. It is similar, and I think the same instrument.

Int. 30. What are the two tall brass posts in line in front of the electro-magnet there?

Ans. They are portions of what Mr. Bell called his vibratory circuit-breaker, which is shown in his patent of June 6, 1876.

Int. 31. How long is the core of the electro-magnet over which the free end of the reed projected?

Ans. About an inch and one quarter.

Int. 32. Will you please add to that instrument a reed and clamp such as were on it in June, 1875, in order that the whole may be put in evidence as an exhibit?

Ans. I will do so.

Int. 33. What was that blue coil on the leg which carries the clamp put on for, how was it used, and did you find any advantage in using it?

Ans. It was put on in order to ascertain the effect of magnetization of the reed by a local battery, the blue coil being connected directly with a battery and the other coil with the line wire. The battery current was continuous. On vibrating the reed, magneto-electric currents were induced in the coil connected to the main line. I do not exactly remember, but think it made no difference whether the battery was connected in the local coil or in the main line coil.

Int. 34. Did you know, in the fall of 1875, that Mr. Bell was preparing specifications for his patent of March 7, 1876? And if so, state what you knew about it.

Ans. I did. I remember hearing Mr. Gardiner G. Hubbard urging Mr. Bell to hurry in the preparation of that specification some time during the fall of 1875.

Int. 35. Did you, during that fall or winter, hear why the filing of the specification was delayed?

Ans. I did. Mr. Bell told me that unless he applied for a patent in England before he did in the United States, he was liable to lose his English patent, and I also knew that he was making arrangements with some one to take out the English patent for him.

Int 36. Please look at the exhibits now shown you, marked 26, 27, 28 and 29, put in evidence at Mr. Bell's one hundred and forty-fifth answer. State who made them, and whether they were or were not exhibited at Philadelphia, at the Centennial Exhibition.

Ans. All four of the exhibits were made by me, and were exhibited at the Centennial. I knew they were going to be sent there, and I saw them there myself. The cone of the liquid transmitter, Exhibit 29, has been broken. The straight part that fitted into the transmitter is missing, and it has been mutilated by being converted into a gas stove by myself.

Int. 37. Was articulate speech transmitted by the liquid transmitter, Exhibit 29, before it went to Philadelphia?

Ans. I think it was. If not by that instrument, by a similar one.

Int. 38. Exhibit 30, Bell's memoranda of experiments 1876, are copies of the memoranda which he produced in his one hundred and forty-ninth and subsequent answers: did you see those memoranda on or about the dates at which they were written?

Ans. I did.

Int. 39. Your name is mentioned in these memoranda in connection with a number of experiments: were those experiments performed by you or with your assistance at or about the times of their respective dates?

Ans. They were.

Int. 40. Did you know about the other experiments at the time; and if so, how did you come to know about them?

Ans. I did. Mr. Bell told me of them, and showed me the notes.

Int. 41. Please look at the Exhibit 31, referred to in Mr. Bell's one hundred and sixty-third answer. When was it made and first used, and for what purpose?

Ans. It was made on or about July 15, 1876, at Charles Williams, Jr.'s, workshop, and was intended to be used in the telephones Mr. Bell was using at that time. I know this from the fact that the shaft projecting from the back piece allowed it to be clamped in the ordinary holder in any of his telephones, and I also helped try it.

Int. 42. Mr. Bell, in his one hundred and sixty-fourth answer, speaks of the transmission of speech by telephone between Boston and Cambridge by the use of a permanent magnet and without a battery: do you remember that occasion? And if so, describe the part that you took in it.

Ans. I remember the occasion perfectly. I was at the Boston end of the line, and I think the permanent magnet used was Exhibit 31.

Int. 43. Did you both listen and speak?

Ans. I did; at the same instrument.

Int. 44. Did you hear articulate speech when you listened?

Ans. I did, perfectly.

Int. 45. Where was the battery which was used in any part of that experiment, if any was used?

Ans. At the Boston end of the line in my charge.

Int. 46. Did you at any time transmit or receive speech over the line upon that occasion when the battery was cut off from the circuit?

Ans. I did.

Int. 47. Please look at complainants' Exhibit 33, referred to in Mr. Bell's one hundred and sixty-seventh to one hundred and sixty-ninth answers; state who made it and when it was made.

Ans. I made it during June, 1876, and tested it with Mr. Bell about the first of July.

Int. 48. Did you ever see it used as a transmitter for articulate speech; if so, when?

Ans. I did, and used it for a transmitter about the first of July, 1876.

Int. 49. Have you ever tried, in the speaking telephone for the transmission of articulate speech, diaphragms of different size and thicknesses; if so, what effect did those differences have on the sound heard at the receiving end?

Ans. I have tried such diaphragms. Keeping the thickness of the diaphragms constant and increasing the diameter above a certain size causes what I term a drummy sound to accompany the articulation at the receiving end. Reducing the diameter causes a nasal sound at the receiving instrument. The same effects are produced by keeping the diameter of the diaphragms constant and decreasing and increasing the thickness.

Int. 50. Have you had any practical experience as to the effect of taking away in whole or in part the casing which, in the ordinary hand telephones, encloses the space immediately behind the diaphragm, and round the coil of the magnet? If yea, state what experience you have had on that subject, and what is the result of making that change.

Ans. I have. In the summer of 1877 I had some hand telephones made for practical use, with a portion of this casing removed.

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About twenty-five of these were sent out to our agents. I received complaints shortly after that they did not work satisfactorily, on account of the holes back of the diaphragm, and that the agents were obliged to stop up the holes in order to make the instruments work successfully. I made a careful test myself, and saw that it would not do to leave the casing open, and had a number of telephones then in process of manufacture altered. In Indianapolis, in June of the present year, I was using a telephone in which our agent had made holes back of the diaphragm. Did not know at first that the holes were there, and was surprised at the difficulty with which I heard the voice of the distant speaker. On examining, I found what the trouble was. On stopping up these holes with my fingers I could hear much better. In my opinion, having the back of the diaphragm open would prevent the telephone from being used in many cases where there are outside noises; and I should consider that if two telephone companies were in competition, one using a closed diaphragm and the other a diaphragm open at the back, the former company would have a great advantage over the latter company.

Int. 51. Please look at the instruments now shown you, marked "Complainants' Exhibits 36 and 37," referred to in Prof. Cross's third answer; state whether they were made under your direction, and who made them.

Ans. They were made under my direction by Edward Wilson, one of Mr. Williams's workmen.

Int. 52. Where or how did you obtain directions as to the size of the instrument, of its armature, of its magnet, etc., as well as its general construction?

Ans. I made careful measurements of two instruments introduced as exhibits in Mr. E. S. Renwick's deposition in New York, and the instruments were constructed in accordance with these measurements.

Int. 53. What directions did you give the workman who made them?

Ans. I gave him rough drawings with the measurements marked on them. They were sufficient for him to work by.

Int. 54. Were the instruments 38 and 39, referred to in Prof.

Cross's fourth answer, made under your direction? If so, state what directions were given to you as to size, shape, arrangement, etc.

Ans. They were. A tracing of the drawings filed by Mr. Bell in the Patent Office, with his application for the patent of March 7, 1876, was given to me by counsel, with a request that I should have made a pair of instruments exactly like those shown in the tracing, and of the same size. The drawing was given to Edward Wilson by me and he was directed to make the instruments, which he did.

Int. 55. Please look at the instruments 40 and 41, referred to in Prof. Cross's fifth answer, and state whether they or any part of them were made under your direction, and where and how you procured the parts that were not made under your direction.

Ans. They were made under my directions, with the exception of the membranes and mouthpieces. The latter are the regular membranes and mouthpieces, known as the lovers' telegraph, which operate by a string stretched from one membrane to the other. I purchased them on the street during April or May of the present year.

Int. 56. Who made the parts that were made under your directions, and what directions did you give him about making them and about the size of the parts?

Ans. Edward Wilson. I gave him the size of the core, coil and armature; told him how I wanted it fastened to the tin mouthpiece, and left the rest to his discretion.

Int. 57. What determined you in fixing upon the size of core, coil and armature which is found in these instruments?

Ans. I made them in the same general proportion as those represented in Mr. Bell's March 7, 1876, patent. I took no measurements.

Int. 58. Please look at the instruments Exhibits 42 and 43; state whether they were made under your direction, and if so, what instructions were given you about making them.

Ans. They were made under my directions and were modeled after Exhibits 36 and 37, except as regards the method of adjusting the tension of the diaphragm and the omission of the slide which carries the mouthpiece of 36 and 37.

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Int. 59. Who made them, and what directions did you give to the workmen about making them?

Ans. The mouthpieces were made by a tinsmith outside of Williams's shop, whose name I forget. The wooden rings were turned by a wood turner in Mr. Williams's employ, from a rough drawing which I furnished. The rest of the instruments were made by Oscar Ziegler, one of Charles Williams, Jr.'s, workmen. The latter worked from one of the instruments 36 or 37. The diaphragms were, I think, stretched by me.

Int. 60. Did you stretch any of these membranes except those of 42 and 43; if so, which?

Ans. I did not.

Int. 61. Of what material are these different membranes made?

Ans. The membranes of Exhibits 36 and 37, 42 and 43, are made of parchment such as is used for legal purposes. Exhibits 38 and 39 have membranes of goldbeater's skin. Exhibits 40 and 41 are, I think, made of bladder.

Int. 62. Please look at Exhibits 44 and 45. Were they made under your direction; and if so, what directions did you have about making them?

Ans. They were. I was told by counsel to make an armature attached to a diaphragm as represented in Mr. Bell's March 7, 1876, patent, that could be placed in an ordinary hand telephone; and I gave directions and a rough drawing to Edward Wilson, and he made the instruments.

Int. 63. What directions did you give about the size of the armature?

Ans. I do not remember, but it is my impression that I left it to Edward Wilson's discretion. The diaphragms are made of legal parchment.

Int. 64. Whether or not you had anything to do with making the telephones Exhibits 18, 19, 20, 21 and 22, — that is, the duplicate telephones of 1875?

Ans. The instruments were not made under my directions, but were made while I was absent on a trip West.

Int. 65. State whether or not these instruments 36 to 43, inclusive, and 19 and 22, are made substantially in accordance with the specification of Mr. Bell's patent of March 7, 1876.

Ans. They are.

Int. 66. Did you take part in any or all of the experiments described in answers 3 to 10 inclusive of Prof. Cross's deposition? If yea, state whether these answers give a correct account of the experiments you witnessed.

Ans. I was present at all those experiments, and I consider the answers correct accounts of the results obtained. [Said answers are printed at the end of Mr. Watson's deposition, p. 223 *infra.*]

Int. 67. Please look at complainants' Exhibit 28, Bell's Centennial Iron Box Magnet Receiver, and state whether you know that that instrument, or one like it, was ever used as a transmitter of articulate speech, and if so, when for the first time.

Ans. I remember using this as a transmitter by placing my hand over an iron plate laid on the top of the tube and talking under my hand against this plate. This was some time during May, 1876. It was somewhere near the date of the presentation to the American Academy of the paper complainants' Exhibit 46. That paper appears to have been presented May 10, 1876. Mr. Bell was at the other end of the line listening at the receiving instrument.

[*Adjourned to Thursday, July* 17, 1879, *at* 10 *A. M.*]

BOSTON, July 24, 1879.

Int. 68. In the memoranda of trials, Exhibit 30, near the end, I find a drawing of a box telephone, which is described as follows: —

"4. Instruments shown in Fig. 3 were constructed somewhere about the 19th or 20th of October before Mr. Watson left for Philadelphia, and they are still the instruments preferred. The electro-magnet was placed in a box B, of wood. The front of the box was then cut away and a sheet of thin steel, A, was screwed on to it by screws *s*, *s*, *s*, *s*."

Do you remember making that instrument; and if so, when?

Ans. I remember, perfectly, making the instruments about the middle of October, 1876. I made two that were almost precisely similar.

Int. 69. When you first made them, did you put in permanent magnets, or simply soft-iron cores without any permanent magnet?

Ans. I put in soft-iron cores without any permanent magnet.

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Int. 70. Did you ever change them by putting in permanent magnets instead of the soft-iron cores; and if so, when?

Ans. I did; about the middle of November, 1876, I substituted for the soft-iron cores in these two instruments hardened steel permanent magnets.

Int. 71. After the middle of November, 1876, did you habitually use for your regular trials and experiments and other uses of speaking telephones, instruments with permanent magnets, and without a battery, or instruments with soft-iron core, electro-magnets and batteries?

Ans. I do not think we discarded the electro-magnets and battery altogether till about the first of December, but used one about as much as the other till that time.

Int. 72. Are you familiar with the various forms of telephone in practical use?

Ans. I am.

Int. 73. What kinds of telephones are in practical use which are not provided with a cover to enclose tightly the electro-magnet and back side of the diaphragm?

Ans. I know of none.

Int. 74. What kind of telephones are in practical use which are not provided with a perforated cover in front of the diaphragm, forming a thin chamber in front of the diaphragm, with an opening to speak into or to listen at?

Ans. I know of none.

Int. 75. Have you tried, in the speaking telephone, the use of an instrument which has a tube, of some considerable length, for the sound to travel through between the diaphragm and the operator, as compared with telephones in which the part in front of the disk is constructed like that part in complainants' Exhibit 25, Bell Hand Telephone?

Ans. I have.

Int. 76. What practical difference do you find with regard to the distinctness with which articulate speech is transmitted between these two forms?

Ans. I find there is no practical difference.

Int. 77. In the receiving instruments ordinarily used in speaking telephones, how close is the ear of the listener commonly placed to the diaphragm?

Ans. Rather less than half an inch.

Int. 78. Are there any speaking telephones in practical use in which, either in the transmitter or receiver, a diaphragm is placed in contact with or resting upon the pole of an electro-magnet?

Ans. I know of none.

Int. 79. What is the practical effect of having them in contact as compared with having them close to each other, but so that they never touch?

Ans. In all cases that have come under my observation, the instruments work so much more poorly when the diaphragm is in contact with the pole of the magnet as to render them impracticable for use and to necessitate readjustment.

[*Adjourned.*]

BOSTON, July 25, 1879.

Int. 80. Please look at the description of the trials of June 2, 1879, at No. 40 State Street, Boston, given in Dr. Blake's deposition in his eighth, ninth, tenth, eleventh and twelfth answers, and state generally whether that description is correct.

Ans. I have looked at the description, and think it substantially correct, except that a good many sentences were transmitted, and other parties listened and talked besides Dr. Blake.*

Int. 81. Please describe generally the construction, mode of operation and size of parts of the common Morse relays or sounders in common use.

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* See Mr. Watson's Int. 113, page 307 *infra,* and Dr. Blake's deposition, page 335 *infra.*

Ans. A Morse relay consists of an electro-magnet, fastened to a base, having a lever pivoted at one end, to which is attached an armature of iron opposite the poles of an electro-magnet. This lever is pulled away from the electro-magnet by a spring, and its motion is limited by adjustable screws. The size of the parts varies greatly in different instruments. The length of the electro-magnet ranges from three fourths of an inch to four inches, the resistance from ten or less to three hundred or more ohms. The armature is usually about a sixteenth of an inch thick, half an inch wide and an inch and a half long, with the lever two or three inches long. Its operation is as follows: When the key is depressed at the transmitting station, an electric current passes through the coil of the electro-magnet, which draws the armature towards the cores. When the current ceases, the spring draws the armature back.

Int. 82. Please describe the difference between such a relay and a polarized relay.

Ans. In a polarized relay the cores and armature are magnetized by being fastened to a permanent magnet, and the retractile spring is usually omitted. It is usually operated by reversing instead of merely making and breaking the electric current. The armature is pivoted to one pole of the permanent magnet, and its free end plays between two prolongations of the cores of the electro-magnet. The length of the armature varies from an inch and a half to four inches, the length of the cores from about one inch to two inches and a half. These dimensions are of instruments that have come under my observation, but they are sometimes made greater or less. I believe that in some instruments the armatures and cores are polarized by a battery and coil instead of a permanent magnet, but the effect is the same in either case.

Int. 83. Are you acquainted with any electric bell in practical use, in which the moving portion consists of a lever pivoted at one end, and acted upon by an electro-magnet through the coils of which an electric current is passed? And if so, describe it and the size of its parts.

Ans. I am. The lever is about five inches long, and consists of a strip of iron about three inches long, one eighth thick, three eighths wide. This iron has attached to one end a wire about two inches long, with a metal ball on its end to strike the bell. The armature is pivoted at the other end on one pole of a permanent magnet, and plays between the two cores of an electro-magnet, which is fastened on the other pole of the permanent magnet. The current which actuates this armature is a reversed current produced by a small dynamo-electric machine. The effect of the current is to cause the armature to move rapidly to and fro, having an amplitude of motion of a quarter of an inch. This apparatus is an ordinary form of what is called a magneto bell.

Int. 84. Please state how rapidly the vibrating lever is caused to move in the ordinary operation of the instruments you have described, specifying as to each.

Ans. I should say about ten times per second; but it can be made to move more rapidly.

Cross Examination by CAUSTEN BROWNE, Esq., *of Counsel for Defendant.*

Cross-Int. 85. Describe what you mean by the harmonic receiver which was arranged on the line on the experiment at Mr. Fenollosa's music rooms in 1875, as mentioned in your eighth answer.

Ans. It consisted of an electro-magnet made by attaching a round core of soft iron, with a coil of wire round it, to one end of an L-shaped piece of iron, and to the other end of this piece of iron was clamped a piece of spring steel, projecting over the end of the core, about an inch and a half long, five eighths wide and a fifteenth of an inch thick.

Cross-Int. 86. In the making of the various membrane speaking telephones for experiment or for use as exhibits in this case, from the time that your employment with Mr. Bell began until now, what has been the course of proceeding as to the membranes to insure their having in the instrument the requisite stiffness and elasticity?

Ans. They were moistened, stretched over the ring upon which they were to be mounted in the instrument when in a moist condition, as tightly as possible, and tied with a string or wire.

Cross-Int. 87. Was anything else done to them?

Ans. Nothing, except to let them dry and attach the magnet; and on one occasion I gave directions to have them shellacked, in order to prevent their absorbing moisture from the breath. The only membranes that were shellacked are Exhibits 44 and 45, 38 and 39.

Cross-Int. 88. Why did not the others require to be shellacked for the same purpose?

Ans. Those that were shellacked were so treated to see if any benefit arose from it; and as no necessity arose for talking to the instruments any length of time, I did not have the others shellacked. Some of them were made before the idea struck me of shellacking the diaphragm.

Cross-Int. 89. The other instruments were, if I understand you, not subjected to any use which showed the necessity of shellacking, — showed no imperfection in working which might be remedied by shellacking, did they?

Ans. Yes; I think all of the instruments would have been improved if they had been shellacked, as it would have prevented their absorbing moisture, which I have always found has been an imperfection.

Cross-Int. 90. How long do you think a stretched membrane could be exposed to the moisture of the human breath by actual use in talking against it without becoming flabby so as to require to be replaced or restretched?

Ans. I think it would become somewhat flabby in rather less than half an hour.

Cross-Int. 91. I mean flabby to that degree to render it unsuitable for use in the instrument.

Ans. It depends upon the material of which the membrane is composed. With a legal parchment diaphragm, which is as good as anything, I should say that one hour's constant use would render it inoperative.

Cross-Int. 92. How would it be with goldbeater's skin?

Ans. It would become useless very much more quickly.

Cross-Int. 93. When the membrane gets to this useless condition of flabbiness, what is to be done; does the instrument require a new one, or can you restore the old one to its efficiency, and how?

Ans. If it is provided with a means of adjustment, it can easily be tightened. If there are no means of adjustment, it is sufficient to let it dry, and it will then work as before.

Cross-Int. 94. And while it is drying you must get along without using the telephone, I suppose?

Ans. Certainly. It is necessary, in order to have it dry, to stop speaking to it.

Cross-Int. 95. In some of the experimental or exhibit membrane telephones which have been put in evidence in this case, the armatures are heavier than in the others. What do you understand to be the rule in the construction of membrane telephones, such as are supposed to be shown in the Bell patent of 1876, for determining within reasonable limits the weight of the armature for a membrane of one or another diameter, thickness or material?

Ans. I have no rule. The first armature, Exhibit 24, is about the size of the armature of an ordinary Morse relay, and I think I followed the relay as a model. I have found, however, that it makes very little difference, within reasonable limits, what the weight of the armature is.

Cross-Int. 96. Now please state what you understand by reasonable limits, outside of which it will make a difference.

Ans. I should expect to get good results out of an armature a sixteenth of an inch wide, one sixty-fourth thick, and an inch or two in length, and also from one two inches wide, a quarter of an inch thick and the same length or longer; the length of the armature to be a little greater than one half the diameter of the membrane to which it is to be attached.

Cross-Int. 97. Using, I suppose you mean, for each of these armatures one and the same membrane?

Ans. If the membrane was as large and thick as in Exhibits 20 and 35, any of these armatures could be used with good results. I do not think the difference in the results would be very great.

Cross-Int. 98. I suppose you mean that ordinarily a membrane large and thick enough to actuate a heavy armature will actuate a light one practically well?

Ans. That has been my experience.

Cross-Int 99. Now, as to the converse: a membrane thick and strong enough to properly actuate a light armature will not for that reason answer for a heavy armature, will it?

Ans. There is such a thing as getting an armature too heavy for a membrane, and I do not think the diaphragm of Exhibits 38 and 39, Baby Telephones, would actuate the heavy armature, Exhibit 21, while it might actuate one twice as heavy as that now attached to it.

Cross-Int. 100. Is there any way of determining beforehand the weight of the armature to be used relatively to the thickness and size of the membrane desired to be used?

Ans. I have no way, and know of none.

Cross-Int. 101. Do you know what conditions about a membrane affect or determine what is known as its fundamental rate of vibration?

Ans. I think the diameter, thickness, and material of which the membrane is composed determine the fundamental of the membrane.

Cross-Int. 102. Does its degree of tension also enter into the question?

Ans. It does.

Cross-Int. 103. Do you know what is the effect of subjecting a metallic diaphragm to tension as to its efficiency for the purposes of a speaking telephone?

Ans. I do, I think.

Cross-Int. 104. What is it?

Ans. If the tension is that produced by hammering the metallic diaphragm into a concave form, it does not work as well as if it were flat. If simply stretched laterally, I do not think it would make any difference. But if a metallic diaphragm is clamped very tightly, the transmitted speech is sometimes accompanied by over-

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tones. This does not by any means render the instrument inoperative.

Cross-Int. 105. What effect does it have upon the transmitted speech?

Ans. It causes a disagreeable overtone to accompany the voice in the receiving instrument.

Cross-Int. 106. Has this accompanying overtone no effect upon the distinctness of the sound or articulation to the listener's ear?

Ans. If very strong, it renders the articulation somewhat indistinct; but if slight, it is not noticeable.

Cross-Int. 107. Upon what conditions of the clamped diaphragm does it depend whether the accompanying overtone be strong enough to make the articulation indistinct or not?

Ans. If the diaphragm is clamped very strongly between two metal surfaces, the overtone is stronger than if it is clamped loosely; but I have found where a telephone is very indistinct that it is due to some imperfection in the diaphragm, such as a dent or a warp.

Cross-Int. 108. Is Mr. E. L. Wilson, who has testified for the complainants here, in the employment of Prof. Bell?

Ans. He is not.

Direct Examination resumed.

Int. 109. In making the experimental instruments constructed by you or under your direction since the 1st of April of this year, as stated in your direct examination, did you or did you not change the armatures after the instruments were first made and tried?

Ans. I did not change any of the armatures.

[*Complainants put in evidence the harmonic receiver referred to by the witness above and taken by him for additions, and it is marked " Complainants' Exhibit* 48, *Bell's Harmonic Receiver, W. P. Preble, Jr., Examiner*."]

THOMAS A. WATSON.

Attest: W. P. Preble, Jr., *Examiner*.

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ANSWERS OF PROF. CROSS IN THE DOWD SUIT REFERRED TO IN MR. WATSON'S ANSWER SIXTY-SIX, PAGE 214, *supra*.

Int. 3. Have you ever tried to transmit articulate speech with this pair of telephones, Nos. 36 and 37; and if so, under what circumstances, and with what result?

Ans. I have tried a large number of experiments with these, and certain other telephones of similar construction. The following are the general circumstances under which these experiments took place: The transmitter was placed in room No. 42, Union Building, on State Street, Boston; the receiver was placed in the office of Mr. J. J. Storrow, in the same building, a story lower. The two rooms are separated by an open court, about one hundred feet long, so that no sound was transmitted through the air. The windows were kept tightly closed during the experiments. I was at the receiving end through most of the experiments. My assistant in the department of physics in the Massachusetts Institute of Technology, Mr. J. B. Henck, Jr., was at the transmitter. The battery used was three Bunsen's cells, with chromic acid solution in the porous cups. The first experiments were made June 5, 1879. The messages were sent from the transmitting to the receiving end through a wire connecting the two instruments. A second wire was used for a return circuit. My results were verified by having the message repeated through a second circuit, embracing two ordinary hand telephones. Several different persons spoke into the transmitting instruments. With the telephones described, and marked 36 and 37, singing, laughing and articulate speech were transmitted so as to be clearly understood. Both sentences and regular and irregular counting were distinctly understood at the receiving end. In several cases I recognized the voice of the person speaking. Afterwards I went to the transmitting end and communicated with Mr. Henck at the receiving end.

Int. 4. Please look at the telephones now shown you, and marked "Complainants' Exhibits 38 and 39, Baby Membrane Telephones." Give a general description of them, and state whether you have ever attempted to transmit articulate speech with them, and under what circumstances and with what results.

[*Complainants' counsel puts in evidence two telephones, marked "Complainants' Exhibits Baby Membrane Telephones* 38 *and* 39, *W. P. Preble, Jr., Examiner.*"]

Ans. The transmitter is of the same general construction as the transmitter already described, but differs greatly in size. The same is true of the receiving instrument. The cone is of wood about an inch and a half in length, and the large end about an inch and a half in diameter, — the membrane not quite an inch in diameter. The vibrating armature is half an inch in length, and the electro-magnet is of proportionally small dimensions. The cone of the receiving instrument is also of wood, about an inch and a half in length; the large end, which is closed by a membrane, is not quite an inch in diameter. The armature and electro-magnet are of the same size as those of the transmitter. These instruments have the same dimensions as those represented in a certified tracing from the drawings in the original specification of Fig. 7 of Bell's patent, 174,465, March 7, 1876. The general arrangements for the experiments with these telephones in actual use were the same as those already described, the trial being made on the same day. Several distinct sentences were transmitted, until I was perfectly satisfied that they were capable of transmitting articulate speech.

Int. 5. Please to look at the pair of telephones now shown you, marked "Complainants' Exhibits 40 and 41, Lover's Electric Telephones." Give a description of them; and if you have ever tried to transmit articulate speech with them, state under what circumstances and with what result.

[*Complainants' counsel offers in evidence two telephones, marked "Complainanss' Exhibits* 40 *and* 41, *Lover's Electric Telephones, W. P. Preble, Jr., Examiner.*"]

Ans. Both the transmitter and receiver, which are of precisely similar construction, are made from the cylinders and attached membranes of the ordinary lover's telegraph as sold in the street. To these, magnets and vibrating armatures have been attached, as in the telephones already described. The membranes are about an inch and a half in diameter, and are mounted upon tin tubes about two inches long. The armature is an inch in length. The experiments in the transmission of speech with these instruments were conducted in the same general manner as those already described. Sentences and counting were distinctly transmitted, and in both directions. The same experiments were repeated on a later day with even better results.

Int. 6. State whether or not you found any change in the facility with which articulate speech could be transmitted by the three pairs of telephones you have just described after you had used them continuously for any considerable length of time.

Ans. In several instances I found that as the membrane of the transmitter became moist from the breath, in which case it grew lax and lost its elasticity, the articulation became less distinct. I noticed on one occasion that in the lover's telegraph instrument the membrane of the transmitter grew damp and articulation was impaired. On transferring the magnet and armature to a new cylinder with a dry membrane, the articulation again became clear and distinct.

Int. 7. Please look at the pair of telephones now shown you, marked "Complainants' Exhibits 42 and 43, Adjustable Membrane Telephones." Describe them; and if you have ever tried to transmit articulate speech with them, state under what circumstances and with what results.

[*Complainants' counsel puts in evidence a pair of telephones, marked " Complainants' Exhibits* 42 *and* 43, *Adjustable Membrane Telephones, W. P. Preble, Jr., Examiner*."]

Ans. The general construction of both transmitter and receiver is the same as that of the telephones complainants' Exhibits 15 and 16. They differ, however, from the latter in having an arrangement whereby the tension of the membranes can be varied. The membrane in each is attached to a wooden ring which slides over a second wooden ring. By turning three screws connecting the two wooden rings, the membrane can have its tension increased or diminished at will. The instruments described were first experimented with June 9, 1879. I began by having the membranes of both instruments slightly stretched, in which case faint articulation was heard, the words being frequently understood. On slackening the membranes still further the words became indistinguishable. When the person at the transmitting instrument counted before it, a noise was heard which as nearly as I can represent it in words was as follows: "Boop, boop,

boop, boop-boop, boop-boop, a-hoop, a-hoop, a-hoop," — one sound for each syllable. I then asked the person at the transmitter to pluck the armature with his finger. The sound produced at the receiver can be represented by the words: "Boop, boop, boop, boop." The circuit was then made and broken by hand, giving noises, "Dub, dub, dub, dub." The magnet was then drawn so far from the membrane that even when the current passed, the membrane was still very lax. When my assistant spoke into the transmitter, I heard a noise which I recognized as a voice, but very faint. No words could be distinguished. As my assistant counted I heard the noise, "Boop, boop, boop-boop," — one word for each syllable.

On tightening the membrane, this effect ceased, and articulation was apparent. The membranes were then tightened and the metal cones removed from both instruments. Many sentences were then clearly transmitted between the two stations. In some additional experiments with this telephone performed June 10, 1879, a cornet was sounded before the membrane of the transmitter, the cones having been removed from both transmitter and receiver. The notes were heard at the receiver, but a difficulty arose, as the loud sound of the cornet could also be heard through the air, and it was somewhat difficult to distinguish the notes coming from the telephone from the notes thus heard through the air. On putting the iron cone on the receiving instrument to remedy this difficulty by shutting out extraneous sounds, the various tones of the cornet were heard very clearly in all their modulations. The best results with the cornet were reached when the cone was also on the transmitter. The cornet was also tried with the telephones 36 and 37, whose diaphragms are not adjustable, the various tones being perfectly audible when notes of different pitch were sounded.

Int. 8. State whether or not the method of straining the membrane, adopted in Exhibits 42 and 43, is or is not old and well known; and if so, give some instances of its use.

Ans. The method used in straining the membrane is very well known, being substantially that which is adopted in the kettle-drum, banjo, and most instruments in which membranes are used. It has also been largely used in instruments which, like the phonautograph, are designed for experiments upon the various sounds produced by the voice.

Int. 9. Please to look at the instruments now shown you, marked "Complainants' Exhibits 44 and 45, Hand Telephone Membranes," and describe them. If you have ever attempted to transmit articulate speech with them, state in what manner, under what circumstances, and with what results.

[*Complainants' counsel offers in evidence two instruments, marked "Complainants' Exhibits* 44 *and* 45, *Hand Telephone Membranes, W. P. Preble, Jr., Examiner.*"]

Ans. The instruments exhibited consist each of a membrane stretched over a wooden ring whose inner diameter is about an inch and three quarters. In each of these an armature a little over an inch in length is used, it being hinged at the extremity nearest the wooden ring, while the other end is about opposite the centre of the membrane and firmly connected with the membrane at that point, so that if the membrane is set in vibration the armature will vibrate with it.

The cover, mouthpiece, and diaphragm were removed from each of a pair of ordinary Bell hand telephones, the magnet being drawn backward so that when the metal plate was replaced by the membrane and attached armature, the armature could vibrate opposite the pole of the magnet without striking it. In the experiments performed with this apparatus the same general arrangements as to place, length of line wire, battery power, etc., were used as in the various experiments with different telephones previously described. One of the hand telephones, modified as described, was used as a transmitter, the other as a receiver. With these, messages were transmitted in both directions so as to be clearly understood.

I produce in evidence the two hand telephones used in this experiment, one of them with the cap piece lengthened out so that it can be screwed down over this membrane diaphragm, the other being left in its ordinary condition.

[*Marked "Complainants' Exhibits* 46 *and* 47, *Bell Hand Telephones, W. P. Preble, Jr., Examiner.*"]

Int. 10. State whether in these experiments you tried to transmit articulate speech through any or all of the membrane telephones put in evidence to-day, while holding the membrane and armature horizontal as well as perpendicular; and if so, with what results.

Ans. A number of experiments were tried with the adjustable membrane telephones, Nos. 42 and 43, in which both transmitter and receiver were so held that the membranes and armatures were horizontal, without producing any perceptible change in the distinctness of the articulation.

FURTHER EVIDENCE FOR A. G. BELL.

BOSTON, MASS., March 10, 1881.

Depositions of Witnesses examined pursuant to the Annexed Notice at Boston, Mass., March 10, 1881, *and thereafter by adjournments duly noted.*

Present: WILLIAM D. BALDWIN, *on behalf of Elisha Gray.*
J. J. STORROW, *on behalf of A. G. Bell.*
L. W. SERRELL, *on behalf of Thos. A. Edison.*
G. W. DYER, *on behalf of Voelker and Richmond.*
J. W. McDONOUGH, *in person.*

DEPOSITION OF THOMAS A. WATSON.

THOMAS A. WATSON, *being duly sworn, deposes and says, in answer to interrogatories proposed to him by* J. J. STORROW, Esq., *of counsel for A. G. Bell, as follows:* —

Int. 1. State your name, age, residence, and ocaupation; and have you testified in the case of Bell Telephone Company *v.* Dowd, and is your testimony in that case true?

Ans. Thomas A. Watson; twenty-seven years old; I live in Everett, Mass., and am an electrical engineer. I have charge of the electrical and technical department of the American Bell Telephone Company, including the manufacture of instruments. I have testified in the case mentioned, and my testimony is true.

Int. 2. Will you state how long you have been engaged in manufacturing or superintending the manufacturing of electrical speaking telephones for Mr. Bell and his licensees, and how intimately you have been acquainted with the growth and development of that business?

Ans. I have been engaged in the manufacture of telephones since the summer of 1875. All telephones that have been made for Mr. Bell and his associates have been manufactured under my supervision, with the exception of those made by the American Speaking Telephone Company, which are now in my charge.

Int. 3. Will you state how many electric speaking telephone patents were issued in 1876 in the United States?

Ans. Only one; that of Mr. Bell, No. 174,465, of March 7, 1876.

Int. 4. How many in 1877?

Ans. Three: one of Bell, Jan. 30, 1877, No. 186,787; and two of McTighe, — one Nov. 20, 1877, and one Dec. 18, 1877.

Int. 5. Can you tell me about how many patents on or relating to speaking telephones have been issued in the United States since then?

Ans. About one hundred and fifty.

Int. 6. How many patents for appliances especially adapted to be used in connection with speaking telephones, such as telephone calls, switches, etc., have been issued in the United States since Mr. Bell's first patent?

Ans. About one hundred and thirty.

Int. 7. Please to state whether or not you assisted Mr. Bell in his early exhibitions or most of his exhibitions of his electric speaking telephone in 1876 and the first half of 1877; and whether you personally made or supervised the manufacture of the electric speaking telephones used by him on those occasions.

Ans. I assisted him at nearly all of his exhibitions during 1876 and 1877, and I made nearly all of the telephones used at these exhibitions.

Int. 8. Please state the principal exertions and progress made by Mr. Bell and his associates in 1876 in the use of his electric speaking telephone in public and in introducing it to public attention; and give as part of your answer any newspaper or other publications of that period, which mark or indicate the progress made, the publicity given to his invention, and the manner in which it was received by the community.

Ans. I first produce a drawing of the instrument made by me for Mr. Bell, according to his direction, June 2, 1875. It is referred to on pages 473 and 539 of the record in the Dowd suit (pp. 138, 203, *supra*): —

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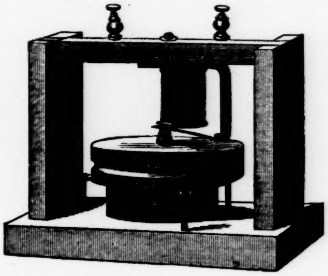
BELL TELEPHONE OF 1875.



DIMENSIONS.

Diameter of membrane	4	inches.
Diameter of spool	1¼	"
Length of spool	1½	"
Length of armature	2	"
Width of armature	½	"
Depth of tube from mouth to membrane	3	"

May 10, 1876, a description by Prof. Bell of his researches in telephony was read before the American Academy of Arts and Sciences, at Boston. This paper was published soon afterwards, and contained a description of his electrical speaking telephone as shown in Fig. 7 of said patent No. 174,465, and described the transmission of speech by it. It also contained a description of an electrical speaking telephone made upon the plan of varying the resistance of an electrical circuit supplied with a constant electromotive force from a battery; the particular form indicated was that known as the liquid transmitter, referred to in said specification, and was described as follows: —

"A platinum wire, attached to a stretched membrane, completed a voltaïc circuit by dipping into water. Upon speaking to the membrane, articulate sounds proceeded from the telephone in the distant room. The sounds produced by the telephone became louder when dilute sulphuric acid or a saturated solution of salt was substituted for the water. Audible effects were also produced by the vibration of plumbago in mercury, in a solution of bichro-

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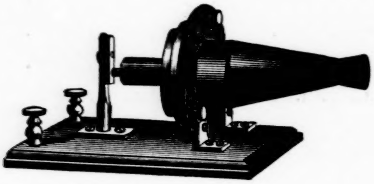
mate of potash in salt and water, in dilute sulphuric acid and in pure water."

This was published in Vol. XII. of their proceedings.

Two sets of Prof. Bell's speaking telephones were made by me for exhibition at the Centennial Exhibition in Philadelphia, and were exhibited there in June, 1876, before the judges of the group and many other persons. They consisted of a "magneto" transmitter and receiver, and of a liquid transmitter. I saw them there on exhibition.

They are referred to on pages 493, 544, 558, of the Dowd record (pp. 159, 208, *supra*). I produce drawings of these instruments as follows: —

BELL'S SINGLE POLE CENTENNIAL MEMBRANE TELEPHONE.

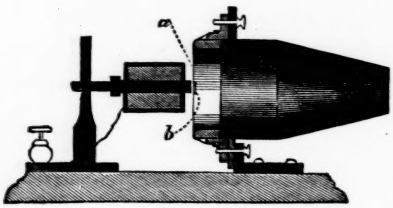


DIMENSIONS.

Length of cone	5¾	inches.
Diameter of membrane	3	"
Length of spool	1¾	"
Diameter of spool	1⅜	"

SINGLE POLE CENTENNIAL MEMBRANE TELEPHONE.

(Sectional View.)



a Stretched membrane.
b Steel spring armature.

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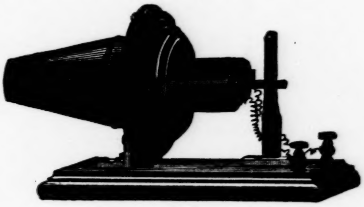
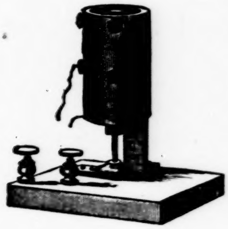
BELL'S DOUBLE POLE CENTENNIAL MEMBRANE TELEPHONE.



DIMENSIONS.

Length of cone	4¾ inches.
Diameter of membrane	3 "
Length of spools	1¾ "
Diameter of spools	1⅜ "

CENTENNIAL IRON BOX MAGNET RECEIVER.

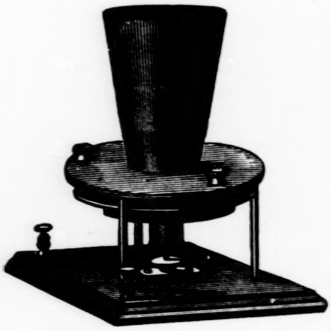


DIMENSIONS.

Diameter of tube	1¾ inches.
Length of tube	3 "

The diaphragm consisted of a soft-iron disk laid loosely over the top. It has since been lost.

BELL'S CENTENNIAL LIQUID TRANSMITTER.



DIMENSIONS.

Diameter of membrane	3	inches.
Diameter of cup	$\frac{3}{4}$	"
Depth of cup	$\frac{1}{2}$	"
Length of cone	6	"

The depositions of Mr. A. G. Bell and of Mr. William Hubbard and of Mr. Elisha Gray, in the suit *Bell Telephone Company* v. *Dowd*, in the United States Circuit Court for the District of Massachusetts, describe one public exhibition of the transmission of articulate speech by them, on June 25, 1876.

Two reports were made upon Mr. Bell's said exhibit. One, by Prof. Joseph Henry, in "General Report of Judges of Centennial Exhibition, Group XXV.," pages 20 and 21, describes the apparatus and the transmission of speech by it, and is as follows: —

"General Report of Judges of Centennial Exhibition, Group XXV., pages 20 and 21.

"THE ELECTRIC TELEPHONE AND MULTIPLE TELEGRAPH.

"The idea of transmitting sounds to a distance by means of electrical currents has been for several years before the world, and the idea of extension of this to telegraphy was evident, though no one had thought it could lead to practical results. But the idea of a multiple electrophonic telegraph transmitting simultaneously several different musical notes, for the simultaneous transmission of different

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messages by one wire, is an invention of high scientific character promising admirable practicable results. For the honor of this invention there are two claimants: Mr. Elisha Gray, of Chicago, Ill., and Mr. Alexander G. Bell, of Salem, Mass. These inventions are independent of one another and different in the method of producing the result. In the telegraph of Mr. Gray several series of waves or impulses are simultaneously transmitted through a single wire. These impulses are excited by interruptions in the current produced by tuning forks of different pitches, and excite, at the farther extremity of the line, corresponding variations in tuning forks of the same pitch. Thus, if four or five tuning forks are vibrated at the same time at one end of a line, each will excite vibrations in its corresponding fork at the other end without affecting the other forks. The exhibitors of this telegraph inform the judges that they are now able to equip lines for actual business with a capacity for carrying, through one wire, eight messages simultaneously, and there is no reason why the number may not be increased to sixteen. This telegraph may be made self-recording, or may be worked forward by relays through greater lengths of line than the insulation allows in one circuit.

"The telephone of Mr. Bell aims at a still more remarkable result, — that of transmitting audible speech through long telegraphic lines. In the improved instrument the result is produced with striking effect, without the employment of an electrical current other than that produced by the mechanical action of the impulse of the breath as it issues from the lungs in producing articulate sounds. To understand this wonderful result, suppose a plate of sheet iron, about five inches square, suspended vertically before the mouth of the speaker so as to vibrate freely by the motion of the air due to the speech; and suppose also another iron plate, of the like dimensions, similarly suspended before the ear of the hearer of the sound: and between these, but not in contact with them, is stretched the long telegraphic wire. Each end of this wire is attached to two coils of insulated wire surrounding a core of soft iron, the ends of which are placed near the middle of the plate, but not in contact with it. These four cores are kept in a magnetic condition by being attached at each end of the line to the two poles of a permanent magnet.

Now, it is evident that in this arrangement any disturbance of the magnetism of one of the permanent magnets, increasing or diminishing it, will induce electrical currents, which, traversing the long wire, will produce a similar disturbance of the magnetism of the arrangement at the other end of the wire. Such a disturbance will be produced by the vibration of the plate of soft iron due to the words of the speaker; and the current thus produced, changing the magnetism of the soft-iron cores, will by reaction produce corresponding vibrations in the iron plate suspended before the ear of the hearer. The vibrations of the second plate, being similar to those of the first, will reproduce the same sounds. Audible speech has, in this way, been transmitted to a distance of three hundred miles, perfectly intelligible to those who have become accustomed to the peculiarities of certain of the sounds. All parts of a tune are transmitted with great distinctness and with magical effect.

"This telephone was exhibited in operation at the Centennial Exhibition, and was considered by the judges the greatest marvel hitherto achieved by the telegraph. The invention is yet in its infancy, and is susceptible of great improvements."

The other report was made by Sir William Thomson, and is as follows. It is found in —

"Reports on Awards, Group XXV., Centennial Exhibition, pages 130, 131.

"3. ALEXANDER GRAHAM BELL, SALEM, MASS., U. S.

"GRAHAM BELL'S ELECTRIC TELEPHONE AND MULTIPLE TELEGRAPH.

"*Report.* — The idea of an electric telephone, or apparatus for transmitting sounds to a distance by variations of electric current through a wire, has been for many years before the world, and has been realized in several ways, differing considerably in details as to the appliances at two points of the circuit for producing the variations of electric current and for deriving perceptible effects from them. An extension of this idea to some kind of electro-phonetic telegraphy was inevitable, even though no one had thought it might or could lead to practically useful results. But the idea of a multiple electro-phonetic telegraph transmitting simultaneously several

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different musical notes, and using intermissions of these (like intermissions of currents in so many separate wires) for the simultaneous and independent transmission of different messages by one wire, is a very fine invention, of high scientific character, promising splendidly useful practical results.

"This invention is claimed by Mr. Graham Bell, and he is entitled to full credit for it, even though, as I believe is the case, it has been also independently invented by others, both in England and America.

"A very well worked-out realization of it is given in Mr. Bell's apparatus now exhibited. A great practical advantage of the electro-phonetic multiple telegraph over other methods of multiple telegraphy through one wire, is that no adjustment is required for varying conditions of the line to render the non-interference among the different messages perfect. Another even more important practical advantage is that it is indifferent between what points of the line and in which directions the different messages are being sent. The different messages can, in fact, be transmitted from any different points of the line, and each may be read at all other stations (whether stations from which others of the messages are being sent or not) with practically perfect non-interference. Another important advantage is that earth currents and lightning discharges will never disturb the signalling.

"Mr. Graham Bell's apparatus includes an ingenious and effective instrument for automatically making and breaking an electric contact every time one of his telegraphic musical notes commences and ceases to sound. Thus his multiple telegraph may be made self-recording (after the Morse or Bain method), or may be worked forward by relay through greater lengths of line than imperfectness of the insulation allows to be worked in one circuit. Mr. Bell showed me in action two of these electro-phonetic relays, recording quite independently the transmission of independent messages by two musical notes in one wire. In addition to his electro-phonetic multiple telegraph, Mr. Graham Bell exhibits apparatus by which he has achieved a result of transcendent scientific interest, — the transmission of spoken words by electric currents through a telegraph wire. To obtain this result, or even to make a first step toward it, — the transmission of different qualities of sounds, such as the vowel sounds, — Mr. Bell perceived that he must produce a variation of strength of current in the telegraph wire as nearly as may be in exact proportion to the velocity of a particle of air moved by the sound; and he invented a method of doing so — a piece of iron attached to a membrane, and thus moved to and fro in the neighborhood of an electro-magnet — which has proved perfectly successful. The battery and wire of this electro-magnet are in circuit with the telegraph wire and the wire of another electro-magnet at the receiving station. This second electro-magnet has a solid bar of iron for core, which is connected at one end, by a thick disk of iron, to an iron tube surrounding the coil and bar. The free circular end of the tube constitutes one pole of the electro-magnet, and the adjacent free end of the bar core the other. A thin circular iron disk, held pressed against the end of the tube by the electro-magnetic attraction, and free to vibrate through a very small space without touching the central pole, constitutes the sounder by which the electric effect is reconverted into sound. With my ear pressed against this disk, I heard it speak distinctly several sentences, first of simple monosyllables, 'To be or not to be' (marvellously distinct); afterwards sentences from a newspaper, 'S. S. Cox has arrived' (I failed to hear the 'S. S. Cox,' but the 'has arrived' I heard with perfect distinctness); then 'City of New York,' 'Senator Morton,' 'The Senate has passed a resolution to print one thousand extra copies,' 'The Americans of London have made arrangements to celebrate the Fourth of July.' I need scarcely say I was astonished and delighted; so were others, including some other judges of our group, who witnessed the experiments and verified with their own ears the electric transmission of speech. This, perhaps the greatest marvel hitherto achieved by the electric telegraph, has been obtained by appliances of quite a homespun and rudimentary character. With somewhat more advanced plans, and more powerful apparatus, we may confidently expect that Mr. Bell will give us the means of making voice and spoken words audible through the electric wire to an ear hundreds of miles distant."

The judges were: Joseph Henry, Sir William Thomson, J. E. Hilgard, James C. Watson, H. K. Oliver, F. A. P. Barnard, J.

Schudmayer, E. Levasseur, P. F. Kupka, Ed. Favre-Perret, Chas. E. Emery.

This apparatus, and the transmission of speech by it, were noticed generally in the newspapers, and the invention attributed exclusively to Prof. Bell. I instance the *Scientific American* of Sept. 9, 1876, the Boston *Transcript* of July 8, 1876, and the New York *Evening Post* of Sept. 5, 1876.

The Boston *Evening Transcript* of July 8, 1876, contains the following: —

Notes at the Centennial. — " . . . Prof. Bell has also a telegraphic and telephonic apparatus in this department for the transmission of many messages over a single wire, and of musical and articulate sounds by telegraph. The experiments which have been made in presence of the Emperor of Brazil, Sir William Thomson, and others interested in the subject, have been highly interesting and satisfactory in their results."

The New York *Evening Post* of Sept. 5, 1876, contains the following: —

"Yet the telegraphic and telephonic apparatus invented by A. Graham Bell should reconcile us to this loss. . . . Prof. Bell has sent a valuable collection that well illustrates the mode by which many messages may be transmitted over a single wire, and also the ease with which musical and articulate sounds may be transmitted by telegraph. . . . Spoken words may be thus transmitted."

A set of these instruments was given to Sir William Thomson, and he is reported to have exhibited them, and explained them and the transmission of speech by them, on assuming the chair of the section of physical science at the Glasgow meeting of the British Association in August, 1876.

The Boston *Daily Advertiser* of Sept. 25, 1876, says: —

"The following passage, taken from the opening address of Prof. Sir William Thomson, on assuming the chair of the section of physical science at the Glasgow meeting of the British Association, will be read with interest, as showing the impression made upon an English student of science by our progress in discovery and in practical science: 'In the Canadian department, I heard, "To be or not to be," "There's the rub," through an electric telegraph wire; but,

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scorning monosyllables, the electric articulation rose to higher flights, and gave me passages taken at random from the New York newspapers: "S. S. Cox has arrived" (I failed to make out the "S. S. Cox"), "The City of New York," "Senator Morton," "The Senate has resolved to print a thousand extra copies," "The Americans in London have resolved to celebrate the coming Fourth of July." All this my own ears heard, spoken to me with unmistakable distinctness by the thin circular disk armature of just such another little electro-magnet as this which I hold in my hand. The words were shouted with a clear and loud voice by my colleague judge, Prof. Watson, at the far end of the line, holding his mouth close to a stretched membrane, such as you see before you here, carrying a little piece of soft iron, which was thus made to perform, in the neighborhood of an electro-magnet in circuit with the line, motions proportional to the sonorific motion of the air.

"'This, the greatest by far of all the marvels of the electric telegraph, is due to a young countryman of our own, Mr. Graham Bell, of Edinburgh and Montreal and Boston, now becoming a naturalized citizen of the United States. Who can but admire the hardihood of invention which devised such very slight means to realize the mathematical conception that if electricity is to convey all the delicacies of quality which distinguish articulate speech, the strength of its current must vary continuously, and as nearly as may be in simple proportion to the velocity of a particle of air engaged in constituting the sounds?'"

This address, or portions of it, containing the foregoing in full or in substance, was published in various newspapers.

A description of the electric speaking telephone, with woodcuts of the apparatus given by Prof. Bell to Sir William Thomson, and the foregoing extracts from Sir William Thomson's address to the British Association, were published in *Engineering* for Dec. 22, 1876, and reprinted in the *Scientific American* supplement, Feb. 10, 1877. These publications attributed the invention to Prof. Bell exclusively. The drawings in *Engineering* are as follows: —

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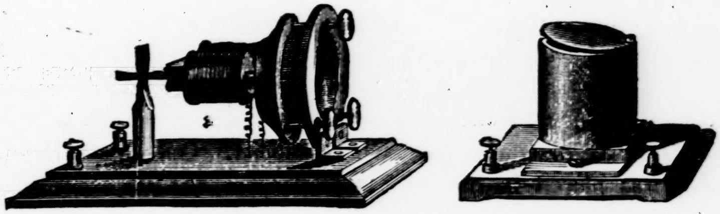

During the fall of 1876, and the following winter and spring, Mr. Bell continued to experiment and operate publicly with his speaking telephone, and these exhibitions were noticed very generally in the newspapers as matters of practical value. I assisted in most or all of these. The invention was invariably attributed to Prof. Bell alone.

The Boston *Daily Advertiser* of Oct. 14, 1876, says: —

"At a meeting of the American Academy on Wednesday evening, Prof. Bell exhibited his wonderful discovery by which sounds may be transmitted through wires by means of the electric current. By the invention of peculiar apparatus, conversation may be carried on through hundreds of miles of wires with the greatest ease."

The *Scientific American* of Sept. 9, 1876, contained the following: —

"THE HUMAN VOICE TRANSMITTED BY TELEGRAPH.

"Several weeks ago we gave a sketch and description of the thread telegraph, consisting of two small tin or wooden cylinders, each having a membrane stretched over one end, the two membranes connected by a stout thread. . . .

"Prof. Graham Bell, by a device somewhat analogous, has succeeded in transmitting the tones of the human voice by telegraph. Instead of the thread, he connects the membranes of the two cylinders or drums with the armatures of the electro-magnets, one drum being placed at each end of the telegraph wire. In fact, he not long ago demonstrated the possibility of conveying vocal sounds by means of the ordinary telegraph wires and special appliances for transmitting and receiving the sounds. The apparatus used by Prof. Bell is thus described: Two single-pole electro-magnets, each having a resistance of ten ohms, were arranged in circuit with a battery of five carbon elements, the total resistance being about twenty-five ohms. A drumhead of goldbeater's skin, about two and three fourths inches in diameter, was placed in front of each electro-magnet, and a circular piece of clock spring was glued to the middle of the membrane of each drumhead. One of these telephones was placed in the experimental room, and the other in the basement of an adjoining house. Upon singing into the telephone the sounds of the voice were reproduced by the instrument in the distant room; and if two persons sang simultaneously, the two notes were audible at the other telephone.

"At the time of the lecture, an experiment was made to show the transmission of articulate speech, an assistant going into the adjoining builing, where one of the telephones was placed. Several familiar questions were, it is said, understood after a few repetitions. The vowel sounds alone are those faithfully reproduced. Diphthongal sounds and rotund vowels are readily distinguished, but consonants are generally unrecognizable. Now and then, however, a sentence comes out with almost startling distinctness, the consonants as well as the vowels being clearly audible. Prof. Bell stated that telephonic effects can be produced with three varieties of currents, — the intermittent, the pulsatory and the undulatory. The first are characterized by the alternate presence and absence of electricity in the circuit, the pulsatory current by sudden changes in intensity, while undulatory currents are obtained by gradual changes analogous to the changes of density of air produced by vibrations of a pendulum.

"The most recent trial of Prof. Bell's instrument was at his residence, Brantford, Canada, Aug. 11. The Toronto *Globe* states that instruments were placed, one in the porch of the residence, and the other in an outhouse on the grounds, and communication between these made by ten miles of wire. Musical notes, the human voice, and songs spoken and sung before one instrument were plainly audible by placing the instrument to the ear at the other. By this invention, too, any number of messages can be conveyed over one wire in either direction, provided they have a different pitch; the tones of the voice can pass over the electric wire, enabling the hearer at any distance to hear distinctly what is said, and to distinguish the voice of the speaker. On Aug. 10 the professor had communication made with his instrument on the common telegraph wire between Brantford and Mount Pleasant (five miles), and was spoken with, while in Mount Pleasant, by Prof. D. C. Bell and Mr. Griffin, from the *Dominion* office, in Brantford. On the evening of Aug. 12 the professor tried a new experiment, having had an instrument made so that three persons could sing different tunes, or different parts of the same tune, into the instrument at the same time. The trial was perfectly successful, the different voices coming distinctly over the wire at the same time, so that they could be separately distinguished by the listener. The practical exemplification of the lately discovered system of telephony made by the professor afforded much pleasure and information to those present."

The Boston *Daily Advertiser* of Oct. 19, 1876, contained the following: —

TELEPHONY.

AUDIBLE SPEECH CONVEYED TWO MILES BY TELEGRAPH.

Prof. A. Graham Bell's Discovery. — Successful and Interesting Experiments. — The Record of a Conversation carried on between Boston and Cambridgeport.

The following account of an experiment made on the evening of Oct. 9 [1876], by Alexander Graham Bell and Thomas A. Watson, is interesting, as being the record of the first conversation ever carried on by word of mouth over a telegraph wire. Telephones were placed at either end of a telegraph line owned by the Walworth Manufacturing Company, extending from their office in Boston to their factory in Cambridgeport, a distance of about two miles. The company's battery, consisting of nine Daniell cells, was removed from the circuit, and another, of ten carbon elements, substituted. Articulate conversation then took place through the wire. The sounds, at first faint and indistinct, became suddenly quite loud and intelligible. Mr. Bell, in Boston, and Mr. Watson, in Cambridge, then took notes of what was said and heard, and the comparison of the two records is most interesting, as showing the accuracy of the electrical transmission: —

Boston Record.	*Cambridge Record.*
MR. BELL. What do you think was the matter with the instruments?	MR. BELL. What do you think is the matter with the instruments?
MR. WATSON. There was nothing the matter with them.	MR. WATSON. There is nothing the matter with them.
B. I think we were both speaking at the same time.	B. I think . . . at the same time.
W. Can you understand anything I say?	W. Can you understand anything I say?
B. Yes; I understand everything you say.	B. Yes; I understand everything you say.
W. The reason why you did not hear at first was because there was a relay in the circuit.	W. The reason why it did not work at first was because there was a relay in the circuit.
B. You may be right, but I found the magnet of my telephone touching the membrane.	B. You may be right, but I find . . . that my . . . touches the membrane.
W. I cut this relay out, and then the sounds came perfectly.	W. I cut the relay out, and then the sounds came perfectly.
B. I hear every syllable. Try something in an ordinary conversational voice.	B. I hear every syllable. Try something in a conversational voice.
W. Shall I connect their battery in the circuit?	W. Shall I connect their battery in the circuit?
B. No; there is no necessity to connect their battery in the circuit, for the sounds come out quite loudly.	B. No; there is no necessity for putting their battery in the circuit, as the sounds come out quite loudly.
W. I am now talking in quite a low tone of voice.	W. I am now talking in quite a low tone of voice.
B. The sounds are quite as loud as before, and twice as distinct.	B. The sounds are quite as loud as before, and quite as distinct.
W. Cut out the battery and then talk.	W. Cut out the battery and then talk.
B. All right; I will cut out the battery now if you will keep listening.	B. All right; I will cut out the battery now if you will keep listening.

[Here an interruption occurred, and after a short time Mr. Bell said: —]

B. I thought you were going to say something.	B. I thought you were going to say something.
W. Is the battery cut out?	W. Is the battery cut out?
B. No; but I will do it now.	B. No; but I will do it now.

[Battery having been cut out, Mr. Bell continued: —]

B. Do you hear anything now?

[Battery replaced.]

B. Did you hear anything?	B. Did you hear anything?
W. No; not a sound.	W. No; not a sound.
B. Say something to me when I cut out the battery again.	B. Say something to me when I cut out the battery again.

[Battery cut out.]

W.	W. I could not hear a sound when the battery was cut out.

[Battery replaced.]

B. I fancy I heard a trace of your voice.	B. I fancy I heard a trace of your voice.
W. Shall I put on our battery, to see if it increases the effect?	W. Shall I put on their battery, to see if it increases the effect?
B. I'll tell you what we'll do. We'll take off our battery, and put on theirs, as before.	B. I'll tell you what we'll do. We'll take off our battery altogether, and put on theirs, as before.

[The company's batteries having been placed in circuit, faint and indistinct sounds were heard at the Boston end, and then came the intelligible sentence.]

W. Is our battery off?	W. Is our battery off?
B. Yes, our battery is off. What have you been doing? The sounds were quite soft at first, but now they are quite loud.	B. (Very indistinct — unintelligible.)
B. Shall I put in our battery again?	
W. (Indistinctly heard.) That was very indistinct. Put on our battery.	W. That was very indistinct. Put on our battery.

[Original battery replaced.]

B. We may congratulate ourselves upon a great success.	B. We may congratulate ourselves on our great success.
W. Both batteries are on now. (Another sentence heard indistinctly.)	W. We deserve success. Both batteries are on now.
B. Repeat the last sentence.	B. Repeat the last sentence.
W. Both batteries are on now.	W. Both batteries are on now.
B. I understood that before, but thought you said something else.	B. I understood that before, but thought you said something else.

W. Remove their battery, please.	W. Reverse your battery, please.
B. All right; our battery is the only one on now.	B. All right; our battery is the only one on now.
W. I have put battery cells on here.	W. I have six Daniell cells on here.
B. How many cells have you there?	B. How many cells have you on there?
W. S-i-x — six.	W. S-i-x — six.
B. Please whisper something to me.	B. Please whisper something to me.
W. (Sound of the whisper clearly audible, but the utterance unintelligible.)	W. Now I am whispering.
B. I could hear you whispering, but could not understand what you said.	B. I could hear you whispering, but could not understand what you said.
W. Perhaps we have got the batteries opposed to one another. Had you not better reverse your battery and see what the matter is, or rather what the effect is?	W. Perhaps we have got the batteries opposed to one another. Had you not better reverse yours and see what the effect is?
B. I will try the effect of reversing my battery.	B. I will try the effect of reversing my battery.

[Battery reversed.]

B. Is this any better?	B. Is this any better?
W. That sentence was accompanied by that curious crackling sound.	W. Much fainter, accompanied by that curious bubbling sound.
B. Yes; I hear it too.	. . . .
B. What time is it by your watch?	. . . .
	. . . .

[Battery again reversed.]

W. What are you doing? I have not heard anything except . . . for quite a while.	W. What are you doing? I haven't heard anything except that bubbling sound for quite a while.
B. I asked you what time it was by your watch. Perhaps you hear me better now, because I have reversed the battery again.	B. I asked you . . . . because I . . . .
W. My battery is now cut out.	W. My battery is now cut out.
B. Don't you think we better go home now?	B. Do you think we had better go home now?
W. Yes; but why does your talking come out so much fainter now?	W. Yes; but why does your talking come out so much fainter now?

LEPHONE COMPANY,-3

[Mr. Bell here placed the magnet of the telephone nearer to the membrane.]

B. Because I had moved the magnet further away from the membrane.	B. Because I moved the magnet further away from the membrane.
W. That was very much more distinct.	W. That was very much more distinct.
B. Will you try to understand a long sentence if I speak right on?	B. Will you try to understand a longer sentence if I speak right on?
W. I will.	W. I will.
B. A few minutes ago I heard a fire engine pass by the door. I don't know where the fire is, but the number of the box is 196.	B. A few minutes ago I heard a fire engine go past the door. I don't know where the fire is, but the number of the box is 196.
W. The time by my watch is five minutes past ten. Had I not better go into Boston?	W. The time by my watch is five minutes past ten. Had I not better go into Boston?
B. Yes; I think it is time to stop now.	B. Yes; I think it is time to stop now.
W. Shall I go to Exeter Place?	W. Shall I go to Exeter Place?
B. Yes; but look in here on your way, in case I have not gone.	B. Yes; but look in here on your way, in case I have not gone.
W. Let us talk conversationally, without noting.	W. Let us talk conversationally, without noting.

Conversation was then carried on for about half an hour with the utmost freedom, and the experiment closed.

Int. 9. Before going any further, please to state whether the preceding account in the *Advertiser*, of your use of the telephone between Boston and Cambridge, is substantially correct, so far as it goes.

Ans. It is correct.

Int. 10. Please to continue your answer to Int. 8.

Ans. The Boston *Evening Transcript* of Oct. 19, 1876, says: —

" *Telephony.* . . . The registry of sounds by telegraph has now been carried to such a point that the delicate variations involved in the articulation of human speech are transmitted with such unerring accuracy and distinctness that one may talk with another through the telegraph as though face to face.

" The leading scientific men of the world gathered at Philadelphia last summer saw the fact accomplished on a small experimental scale. Sir W. Thomson was so impressed that in his opening address as president of the British Association, he described it at some length, and pronounced it the greatest by far of all the marvels of the electric telegraph. Ten days ago the test was repeated over an actual out-of-door telegraph between this city and Cambridge. The entire success of this experiment marks, for all that we can see, a revolution and advance in the world's progress worthy to rank with the practical completion of the first printing telegraph in New York City about forty years ago, and with the laying of the great ocean cables twenty years ago.

"The operation of this new and startling development of telegraphic mechanism is thus described by Prof. Thomson, in the address referred to: —

"'All this my own ear heard spoken to me with unmistakable distinctness by the thin, circular disk armature of just such another little electro-magnet as this which I hold in my hand. The words were shouted with a clear and loud voice by my colleague judge, Prof. Watson, at the far end of the line, holding his mouth close to a stretched membrane, such as you see before you here, carrying a little piece of soft iron, which was thus made to perform, in the neighborhood of an electro-magnet in circuit with the line, motions proportional to the sonorific motions of the air.' . . .

"We give in another column the interesting account of the practical exemplification of the invention between Boston and Cambridge. The inventor, Mr. Graham Bell, is a young Edinburgh scientist, formerly of Montreal, but later of this city, and a naturalized citizen of the United States."

During the fall of 1876 and the following winter and spring, Mr. Bell operated publicly his electric speaking telephone. I assisted at most or all of these exhibitions. They were noticed very generally in the newspapers as matters of practical value. I mention: —

Boston *Post*, Oct. 20, 1876.
Boston *Daily Evening Traveller*, Oct. 19, 1876.
Boston *Sunday Herald*, Oct. 22, 1876.
Titusville *Herald*, Oct. 22, 1876.
Boston *Evening Transcript*, Oct. 19, 1876.

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These describe the transmission of speech from Boston to Cambridge.

The New York *Tribune* of Monday, Oct. 23, 1876, says: —

"The experiments which Prof. A. Graham Bell has been recently making, relative to the transmission of speech by wire, have been quite successful. Two operators were stationed two miles apart, one in Boston and the other in Cambridge. The battery ordinarily used was replaced by one of ten carbon elements. At first the sonuds were indistinct, but soon they grew clear and intelligible. The operators carried on a long conversation, and on subsequently comparing their records ascertained that the tones had been transmitted with perfect accuracy."

An editorial in the New York *Tribune* of Nov. 9, 1876, contained the following: —

"The Centennial Exhibition has afforded the opportunity to bring into public view many inventions and improvements which otherwise would only have been known to the smaller circles that may find them of service. . . . The telephone is a new instrument of electrical science, more likely than some of the rest to find immediate use. It operates by transmitting the current through a tuning fork. The fork will only vibrate a given number of times in a second. A message can be sent through it by the usual Morse code, there being no apparent interference between the tuning-fork vibrations and the message. But at the other end of the line the message can be taken off through a tuning fork in unison with the first. Consequently, if a tuning fork of different pitch is interposed at each of several stations served by one wire, and the messages are sent through forks of corresponding pitch from the head office, the message to one station will not be repeated at the others during transmission.

"Sir William Thomson, at the Glasgow meeting of the British Association for the Advancement of Science, gave foreign notoriety to another of the Centennial exhibits that has attracted great attention from the judges of the group to which it belongs. It is a curious device, that might fairly find place in the magic of Arabian tales. A membrane is stretched over the end of a short speaking trumpet. The membrane carries a small piece of metal which is, so to speak, the armature of a magnet. The magnet forms part of a telegraph circuit, through which a current is passing. To send a message it is only needful to talk loudly into the trumpet.

"The message is received by a similar trumpet with membrane and armature at the other end of the line; and that trumpet being placed to the ear repeats the sound like an echo. Dom Pedro was with the scientific people who tested this instrument on one occasion; so accurately did it reproduce sounds that each member of the party was in turn recognized by peculiarities in voice or accent. The final test was the reading of a paragraph from the news columns of the *Tribune*. Of what use is such an invention? Well, there may be occasions of state when it is necessary for officials who are far apart to talk with each other without the interference of an operator. Or some lover may wish to pop the question directly into the ear of a lady and hear for himself her reply, though miles away; it is not for us to guess how courtships will be carried on in the twentieth century. It is said that the human voice has been conveyed by this contrivance over a circuit of sixty miles. Music can be readily transmitted. Think of serenading by telegraph!"

Nov. 26, 1876. We carried on a long conversation on the lines of the Eastern Railroad, using part of the time a circuit from Boston to Salem (fifteen miles), and part of the time a circuit from Boston to North Conway and back to Salem, and part of the circuit from Boston to Portland and back, about two hundred miles of actual telegraph wire.

This is noticed in —

Boston *Post*, Boston *Daily Globe*, Boston *Daily Advertiser* and Boston *Herald*, of Nov. 27, 1876.

The Boston *Post* of Nov. 27, 1876, says: "The experiments in electric telephony which Prof. A. Graham Bell has been conducting for several years past have resulted in the development of apparatus by means of which the human voice, as ordinarily used in speaking, can be transmitted with certainty and ease to an indefinite distance, — assuredly hundreds of miles. . . .

"The latest experiments with the telephones were made yesterday over the wires of the Eastern Railroad, that day being selected because the trials would not then be interrupted by the ordinary business of the line. Prof. Bell, President Rockwell of the Eastern road, and wife, Miss Stearns, Mr. Morrison, and Mr. Hubbard, beside two telegraph operators, were the occupants of the Boston office. The instruments were arranged for about a twenty-mile test; consequently Salem, about sixteen miles away, was the point at which the second telephone was fixed. Mr. Thomas A. Watson, assisted by the Salem operator, was in charge there. All those at the Boston end of the line held free and easy conversation with the Salem office, even a whisper or a loud breath being distinctly heard at one end when given at the other."

Int. 11. Please to answer the same interrogatory as to the first half of 1877.

Ans. Jan. 13, 1877, Prof. Bell gave a lecture on his electric speaking telephone, with an exhibition of it, before the Washington Philosophical Society, at Washington, D. C. This was reported in the Washington *Evening Star* of Jan. 20, 1877.

The said report in the *Evening Star* begins as follows: —

"*Bell's Telephone.* At a meeting of the Washington Philosophical Society on the evening of the 13th January, Mr. Bell, the inventor, gave to the members a description of the construction and operation of his most admirable and wonderful invention, *and exhibited it in operation.*"

The Boston *Daily Advertiser* of Jan. 22, 1877, contained the following: —

"The most important of the tests made recently by Prof. A. Graham Bell, in the practical development of telephony, is dispensing with the use of the battery entirely, so that now all that is required to communicate between the most distant places is simply a line of wire and the telephones.

"Yesterday morning successful experiments were made between Boston and Salem, on the Eastern Railroad wire. At the Boston end were Prof. Bell, Mr. Nutting, the operator, Mr. E. H. Foster, Mr. William Auld, and Mr. J. B. Parker; and at the Salem end, Mr. T. A. Watson, who is associated with Mr. Bell, and the lady operator.

"Recently two Japanese gentlemen conversed in their own language through the telephones, and had no difficulty in understanding all that they said. An experiment has been made in overcoming an artificial resistance greater than the Atlantic cable, and there is no doubt but that it will be possible to talk across the Atlantic."

The Boston *Evening Transcript* of Feb. 1, 1877, contained a long description of an exhibition of a telephone, in which the following is found: —

"At noon, yesterday, a distinguished party of gentlemen were assembled at the office of the Boston Rubber Shoe Company, on Congress Street, in order to witness a series of experiments performed on the telephone between the inventor, Prof. A. Graham Bell, here, and his associate, Mr. Thomas A. Watson, at the residence of Mr. Converse, at Malden, about six miles distant.

"Prof. Bell had been invited by some of our most prominent citizens to give a practical demonstration of the most recent developments of an invention which, in accordance with its name, has already sounded far and wide the fame of the telephone. The experiments yesterday were as follows: —

"Telephones having been connected with the private telegraphic line of the Boston Rubber Shoe Company, and the operators at either end having taken up their station, conversation was at once commenced. Stationed at the Boston end of the wire, Prof. Bell requested Mr. Watson to speak in loud tones, with a view of enabling the entire company at once to distinguish the sounds.

"This was so successful that a smile of mingled pleasure and surprise played on the features of those present. That it, however, might not be supposed that loud speaking was essential to intelligibility, Mr. Bell explained that soft tones could be heard across the wires even more distinctly than loud utterances, even a whisper being audible. In confirmation of this statement, Mr. Watson commenced speaking in turn to each member of the company; and after the efficiency of this method had been proved to the satisfaction of all, he took up a newspaper and informed the assemblage that gold had closed the previous evening at New York at 105$\frac{5}{8}$.

"As there were quite a number of business men present, the effect that this practical demonstration of the value of the telephone produced can scarcely be exaggerated. Other passages from the daily journals were then given; and by this time the desire for conversation having become general, Mr. Watson was plied with questions, such as, Is it thawing or freezing at Malden? Who is to be the next President? etc., etc. It was remarkable that Mr. Watson was able to distinguish between the voices at the Boston end, he calling at least one gentleman by name as soon as the latter commenced speaking.

"This went on for some time until a lady at the Malden end sent the company an invitation to lunch per telephone, and an appropriate response was made by the same medium.

"At length the company were requested to remain quiet while a lady at the other end conveyed to them the sweet strains of music. The assemblage thereupon listened with rapt attention while a young lady commenced singing 'The Last Rose of Summer.' The effect was simply charming. Possessing, as the fair cantatrice does, a voice of exquisite sweetness, the sounds penetrated into the Boston end of the telephone with a distinctness equal to that attainable in the more distant parts of a large concert room, and a unanimous vote of thanks was sent by the handy little instrument which had procured for the assemblage so agreeable an hour.

"Among those present were electricians and gentlemen occupying prominent positions on our Western railroads, and one and all expressed the conviction that the telephone was destined to achieve the greatest possible results. Let us hope that the day is fast approaching when every man will be in a position to turn on the electricity in his house with the same facility with which he now turns on the water or the gas. C. H. H."

Early in 1877, Prof. Bell began to give public lectures and exhibitions of his electric speaking telephone.

He gave one in Salem, Mass., Feb. 12, 1877, and a report of it, published in the Boston *Globe* of Feb. 13, was transmitted from Salem to Boston by his speaking telephone.

The same *Globe* of Feb. 13, 1877, contained the following: —

"We have the pleasure of presenting to our readers this morning the first despatch ever sent to a newspaper by the newly invented telephone, Prof. A. Graham Bell's system of transmitting sound by telegraph. The despatch was sent from Salem, where Prof. Bell lectured last evening, our active representative in that city having secured the exclusive privilege of the instrument for that purpose. The message was received in this city by another representative of the *Globe*, who could readily recognize the voice at the other end.

. . . .

"SENT BY TELEPHONE. — THE FIRST NEWSPAPER DESPATCH SENT BY A HUMAN VOICE OVER THE WIRES. — TO THE DAILY GLOBE, FROM SALEM. — PROF. GRAHAM BELL EXPLAINS HIS VALUABLE INVENTION. — AN ENTHUSIASTIC AUDIENCE. — HOW THE CAPACITY OF THE TELEPHONE WAS TESTED.

"*Special despatch by telephone to the Boston Globe.*

"SALEM, Feb. 12, 10.55 P. M.— Prof. A Graham Bell, the inventor of that wonderful instrument, the telephone, which has caused so much interest in the scientific world, and which is now becoming so popularly known, lectured on his invention at Lyceum Hall this evening. The lecture was one of a course of the Essex Institute, and about five hundred persons were present.

. . . .

"Mr. Watson was then asked to make a speech to the audience. He expressed himself as having more confidence eighteen miles away than if he were present. His speech was as follows: —

"'*Ladies and Gentlemen,* — It gives me great pleasure to be able to address you this evening, although I am in Boston and you in Salem.' This could be heard thirty five feet distant, — that is, all over the hall, — and brought down the house with applause. A system of questioning was then carried on, and Mr. Watson was asked if he heard the applause. The answer was, 'I was not listening; try again.' The applause was given, and its receipt at once acknowledged in Boston. Coughing and singing were then heard, and a variety of questions were then asked from the Salem end, and among them, 'What news from the Electoral Commission?' followed by the distinct answer of 'I don't know of any.' But the news came fleeting along that the engineers of the Boston and Maine Railroad had struck. Gen. Cogswell asked if trains were running; the answer was clear and distinct that they were not at 5.30 o'clock. Prof. Bell introduced the Rev. E. C. Bolles, who said, 'I shake hands with you cordially in imagination twenty miles away.' The Rev. E. S. Atwood asked, 'Does it rain?' 'It does not in Boston,' was Mr. Watson's answer. Prof. Gage, the electrician, then spoke through the telephone, endeavoring to have his voice recognized. This could not be done, as Mr. Watson was not familiar with the voice. Mr. Shaje Zsawa was recognized, Mr. Watson being perfectly familiar with his tones. One of the assistants in Boston then said that 'Hold the Fort' would be sung in Boston, and the tune which followed was readily recognized. Prof. Bell closed his lecture by briefly stating the practical uses to which he was confident the telephone could be applied. Hearty applause was afforded the lecturer as he finished, and people flocked about the stage in large numbers to more closely examine the wonderful instrument that had placed them in audible communication with people nearly twenty miles away.

. . . .

"This special by telephone to the *Globe* has been transmitted in the presence of about twenty, who have thus been witnesses to a feat never before attempted, — that is, the sending of a newspaper despatch over the space of eighteen miles by the human voice; and all this wonder being accomplished in a time not much longer than would be consumed in an ordinary conversation between two people in the same room.

H. M. B.

"THE SCENE AT THE BOSTON END.

"The instrument which transmitted the wonderful voice message to the listening ears in this city was placed in a little room in Exeter Place, where were assembled Prof. Watson, Benjamin Bridden, the electrician, Prof. E. B. Warman, and Mr. A. B. Fletcher, representative of the *Globe*. The experiment was certainly a great success. The conversation with the friends eighteen miles away was carried on in ordinary tones of voice. The *Globe* representative in Boston very easily recognized the voice of the transmitter of the despatch in Salem, and very distinctly heard the applause which was given in the Essex Institute Hall. It was a very noteworthy occasion, certainly; and the complete success attained led to the discussion of many plans for the further practical utilization of the telephone, which sends its first newspaper despatch to the *Globe* readers for their delectation and wonder, this morning."

The Boston *Daily Globe* of Feb. 15, 1877, contained the following: —

"THE TELEPHONE. — SOMETHING ABOUT THE CONSTRUCTION AND WORKING OF PROF. BELL'S WONDERFUL INVENTION.

"As the telephone, the new invention of Prof. A. Graham Bell, is but little understood, the following reprint of a description and explanation of the instrument may not be amiss: —

"'The telephone in its present form consists of a powerful compound permanent magnet, to the poles of which are attached ordinary telegraph coils of insulated wire. In front of the poles, surrounded by these coils of wire, is placed a diaphragm of iron. A mouthpiece to converge the sound upon this diaphragm substantially completes the arrangement. The motion of steel or iron in front of the poles of a magnet creates a current of electricity in coils surrounding the poles of the magnet, and the duration of this current of electricity coincides with the duration of the motion of the steel or iron moved or vibrated in the proximity of the magnet. When the human voice causes the diaphragm to vibrate, electrical undulations are induced in the coils environing the magnets precisely analogous to the undulations of the air produced by that voice. These coils are connected with the line wire, which may be of any length, provided the insulation be good. The undulations which are induced in these coils travel through the line wire, and, passing through the coils of an instrument of precisely similar construction at the distant station, are again resolved into air undulations by the diaphragm of this instrument.'

"It was by this wonderfully simple instrument that the three quarter of a column report of Prof. Bell's lecture was transmitted from Salem to the GLOBE by the voice on Monday evening. All who saw the working of the instrument were astounded at the results obtained."

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The following report of the Salem lecture appeared in the Salem *Observer* of Feb. 17, 1877:—

"SATURDAY, Feb. 17, 1877.

"THE TELEPHONE.—The illustrated lecture upon telephony, by Prof. A. Graham Bell, was exceedingly interesting. The results exhibited were indeed amazing; nearly every experiment was successful. . . .

"On Monday evening, Mr. Watson, who was in the Boston office, 'wired' several tests to the audience of five hundred who were assembled in the Lyceum Hall. He conversed with Prof. Bell freely; the latter asking questions in an ordinary tone of voice, with distinct articulation, and the answers immediately returning and having a sort of muffled sound. Mr. Watson addressed some words to the audience in Salem, which were distinctly heard, and the applause which followed was heard by him in Boston. He sang 'Auld Lang Syne' and other pieces, and played upon a reed organ, all the sounds of which were duly delivered at the Salem end of the wire. The person in Boston was also heard to cough and to laugh. During the evening Rev. Dr. Bolles, Rev. Mr. Atwood, Prof. Gage, Gen. Cogswell, a gentleman from Japan, and a lady (Miss Loring) all spoke successfully through the telephone. A full report of the meeting was sent to the *Globe* by telephone from its correspondent, Mr. Batchelder.

"The apparatus by which this astonishing result is secured is wonderfully simple: only a telegraphic wire, a horseshoe magnet, two helices and a vibrating disk, at each end. The audience see only a mahogany box upon the table, of the appearance of an ordinary photographer's camera. The tube in the end is used in this case to speak into and to hear out of. Within the box is a horseshoe magnet. Opposite each arm of the magnet is a helix of the usual construction.

"One end of the wire among the helices is connected with the ground, and the other with Boston, or the place in operating connection. Set up against the helices, within a sixteenth of an inch, is a sheet of thin polished iron, upon which the voice of the operator impinges when speaking. The magnet induces an electrical current

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in the telegraphic wire. The vibrating disk imparts pulsations to this electrical current corresponding to the sound, which are conveyed to Boston, and reproduce themselves upon the vibrating disk there with exactness of tone and articulation. The little four inches of iron utters the whole gamut of the human voice. This is indeed wonderful, — the greatest achievement of modern science. Another exhibition of the telephone is to be given."

The following is an extract from an article in the New York *Sun* of Feb. 20, 1877: —

"PROF. BELL'S TELEPHONE. — THE HUMAN VOICE CARRIED A HUNDRED AND FORTY MILES. — MARVELLOUS STORIES ABOUT THE LATEST ACHIEVEMENT OF SCIENCE. — MUSIC IN SALEM AND APPLAUSE IN BOSTON. — THE CONSTRUCTION AND CAPABILITIES OF THE INSTRUMENT DESCRIBED.

. . . .

"The honor of having received the first newspaper despatch ever sent by means of the telephone belongs to the Boston *Globe*. A report of a lecture by Prof. Bell, in Salem, was transmitted verbally to it last Monday night. This lecture was about the telephone, and in the course of the evening a series of remarkable experiments was made in the presence of the audience. Songs and brief speeches were sent from Boston, and the applause which greeted their reception in Salem was distinctly heard in Boston. Imagine sitting in a hall and hearing a man eighteen miles away sing 'Hold the Fort'!

"'I haven't the slightest doubt,' Mr. Watson said to-day, 'that in a few months things will be so that a man can make a lecture here in Boston and be heard by an audience in any part of the country.'

"'Do you expect that the telephone will entirely supersede the present system of telegraphing?' I asked.

"'Yes, we expect it will, eventually. A company is now forming for the purpose of manufacturing and introducing the instrument. In time it can't fail to replace the old dot-and-line alphabet system entirely. We expect at first it will be used mostly on private lines and for city business. It will probably take the place of the present district telegraph companies and the like, as it will be especially convenient for that class of business.'

. . . .

"The wonderful little instrument, of whose future value to civilization the inventor is so sanguine, consists of a powerful compound permanent magnet, to the poles of which are attached ordinary telegraph coils of insulated wire. In front of the poles, surrounded by these coils of wire, is a diaphragm of iron. A mouthpiece, whose function is to converge the sound upon this diaphragm, substantially completes the arrangement. The operation of the instrument is thus described by Prof. Bell: The motion of steel or iron in front of the poles of a magnet creates a current of electricity in coils surrounding the poles of the magnet, and the duration of this current of electricity coincides with the duration of the motion of the steel or iron moved or vibrated in the proximity of the magnet. When the human voice causes the diaphragm to vibrate, electrical undulations are induced in the coils around the magnets precisely similar to the undulations of the air produced by the voice. The coils are connected with the line wire, and the undulations induced in them travel through the wire, and passing through the coils of another instrument of similar construction at the other end of the line, are again resolved into air undulations by the diaphragm of this instrument. The voltaic battery is entirely dispensed with. The line wire may be of any given length, provided the insulation be good. Prof. Bell further says that soft tones can be heard across the wires even more distinctly than loud utterances, even a whisper being audible."

Feb. 23, 1877, a second lecture and public exhibition was given at Salem. A long report of this was transmitted by telephone, and published in the Boston *Daily Globe* of Feb. 24, 1877. That report contains the following: —

"*Special Despatch by Telephone to the* BOSTON GLOBE.

"SALEM, Friday, Feb. 23 10.20 P. M. — Lyceum Hall has been crowded this evening with an audience of five hundred, which had assembled to hear Prof. A. Graham Bell's interesting lecture on

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his wonderful invention, the telephone, and the results obtained by the evening's exhibition were certainly most astonishing. This was the second public exhibition of the new invention and its practical uses, and Salem has been fortunate indeed in having both given before her citizens. This second lecture and exhibition was given in response to an invitation to Prof. Bell by a number of scientific gentlemen and prominent citizens, and the audience was one which only a rare and notable occasion can draw together in Salem. Among the more prominent people in the audience were the Hon. George B. Loring, Judge Endicott of the Supreme Court, Prof. D. B. Hagar of the State Normal School, Dr. J. R. Nichols of Haverhill, editor of the Boston *Journal of Chemistry*, Judge Osgood, Mayor Oliver, Aldermen Daton and Stone, Prof. John Robinson, Ex-Mayor Williams, Dr. Henry Wheatland, president of the Essex Institute, the Rev. Messrs. Arey, Dean and Atwood, John W. Perkins, master of the Salem High School, Gen. William Cogswell, J. S. Packard, Esq., and many other prominent citizens. The experiments were similar to those given at the former lecture, and were eminently successful, receiving hearty applause. Prof. Thomas A. Watson, Prof. Bell's assistant, transmitted several messages from the Boston end of the telephonic wire.

. . . .

"The company at the Boston end of the telephonic wire between Boston and Salem was quite as numerous as Prof. Bell's laboratory could well accommodate. It is a little room at the end of Exeter Place, up three flights of stairs, with the various instruments of the telephonic apparatus to be seen on every hand. On one of the tables were the models on which Prof. Bell worked out the telephone as it now exists; and they form an interesting study. Books, letters and papers, all pertaining in more or less degree to the science of electricity, are arranged about the room, which is plainly and tastefully furnished. Occupying the post of duty near the working instrument was Prof. Thomas A. Watson, Mr. B. F. Bridden having charge of the working of the electric apparatus, with two young lads as assistants. The company present included Mr. D. P. Richards, who has been one of Prof. Bell's co-workers, the Hon. Charles Levi Woodbury, John C. Hoadley of Lawrence, Dr. Henry I. Bowditch, Dr. C. J. Blake, Mr. W. A. Hovey and Mr. C. E. Hurd of the *Transcript*, three gentlemen from one of Dr. Tourjée's Tabernacle choirs, a cornet player, and an artist who was illustrating the scene for the *Scientific American*, beside reporters from the various city papers.

. . . .

"The *Globe* despatch then came, followed by another press message, giving merely the news furnished by the *Globe* about the telephone a week ago. Then 'Yankee Doodle' and 'Auld Lang Syne' were sung by Prof. Bell, and distinctly heard in every tone by all in the room; and at 10.30 the conference came to an end."

The Providence *Press* of Feb. 24, 1877, had a long account of the Salem lecture, which contained the following: —

THE PROVIDENCE PRESS.

FEB. 24, 1877.

"We willingly surrender space to-day to the somewhat enthusiastic report by a member of our editorial staff who was invited to witness the experiments with the telephone last night at Salem. The importance of the invention promises to be such as to make all obtainable knowledge of it valuable, and we do not remember to have yet seen any so detailed and intelligible description of its workings as our representative furnishes.

. . . .

"HOW THE THING IS DONE

is, of course, the practical reader's demand. It is done by a magnificent effort of genius, making itself felt with common tools. It is simplicity embodied and almost made personal. There is not even a battery to send an electric current along the line, for the affair is sufficient unto itself within its six by twelve inch dimensions, asking nothing of existing telegraphy but the wires it has strung. The principle is the familiar one that a plate of iron presented to a coil of insulated wire on the end of a magnet causes an electric current to traverse the magnet, provided the circuit is complete. Prof. Bell, therefore, takes a horseshoe magnet, places on each of its ends a nearly flat spiral wire, and just in front of the points of the spirals, an infinitesimal distance away, sets up his plate of iron. To complete this circuit he connects one arm of the magnet with the earth, by means of the gas pipes, and the other communicating wire runs out from the other arm to wherever the other operator may be stationed, with a similar earth connection on the magnet at his end." . . .

On the occasion of this Salem lecture I was at the Boston end of the telephone line, and the account given in the papers which I have quoted from is substantially correct, so far as came under my knowledge. I made the instruments used, and they are correctly described.

The lecture at Salem was followed by a series of lectures in Boston, Providence, Lowell, Manchester and New York, and these were extensively noticed in newspapers in different parts of the country; *e. g.*, the New York *Sun*, Feb. 11, 1877, had nearly a column about the lecture at Salem; the Boston *Journal of Chemistry*, March 1, 1877, had a long account; also the New York *Times; Daily Graphic*, of March 6, 1877, with illustrations; *Scientific American*, March 31, 1877, with illustrations; *Frank Leslie's*, March 31, 1877, with illustrations; *The Athenæum*, London, England, March 3, 1877. At all of them electric speaking telephones with metallic diaphragms were used; at all of them the electric speaking telephones were publicly exhibited, their construction and operation explained, and they were publicly used in the transmission of articulate speech. At these exhibitions an admission fee was charged and paid by the audience. The following accounts of them are substantially correct, so far as they came within my knowledge. The instruments used were made by me, or under my supervision.

The following is the opening paragraph of the article in the Boston *Journal of Chemistry*, of March 1, 1877, above referred to: —

BOSTON JOURNAL OF CHEMISTRY.

BOSTON, MARCH 1, 1877.

"THE TELEPHONE.

"The telephone is the invention of Prof. A. Graham Bell of this city, and has resulted from a course of inductive reasoning, growing out of a careful study of the philosophy of sound, as related to wave motions in air, and in metals when induced by electrical excitation. The instrument is exceedingly simple and inexpensive, and easily understood. It consists in attaching to the terminals of the ordinary telegraph wires, between any two points, powerful compound magnets, with coils of wire connected. In front of the pole, surrounded by these coils of wire, is placed a diaphragm of iron. A mouthpiece to converge the sound upon the diaphragm, substantially completes the arrangement. When the human voice causes the diaphragm to vibrate, closing and breaking the circuit with each vibration, electrical undulations are induced in the coils, precisely analogous to the undulations of the air produced by that voice. These coils are connected with the line wire, which may be of any length, provided the insulation be good. The undulations induced in these coils travel through the line wire, and, passing through the coils of an instrument of precisely similar construction at the distant station, are again resolved into air undulations by the diaphragm of this instrument."

The Providence *Journal*, of March 15, 1877, had a long article on the telephone, from which the following is an extract: —

"THE LAST GREAT WONDER.

. . . .

"In the telephone no galvanic battery is used. A permanent steel magnet is surrounded with a coil of insulated wire, and confronted with a disk of sheet iron. When the iron disk vibrates, under the influence of sound, it disturbs the magnetism of the steel magnet before it; and by a familiar law, every change of magnetism in a magnet excites an electric current in a surrounding coil. The coil is connected with the telegraphic wire, and that with the coil around the magnet at the farther end of the line, the ground being used for the return circuit. The distant magnet thrills with the electric current so excited, and vibrates the disk in front of it, which, in turn, impresses sound waves on the air."

The Boston *Daily Globe*, of April 6, 1877, had a report of the Providence lecture, from which the following is taken: —

AMERICAN BELL TELEPHO

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The Boston *Daily Globe*, of April 6, 1877, had a report of the Providence lecture, from which the following is taken: —

"PROF. BELL EXHIBITS ITS WONDERFUL WORKINGS TO A PROVIDENCE AUDIENCE. — A SUCCESS DESPITE UNFAVORABLE CONDITIONS. — A SPECIAL TO THE 'GLOBE' BY TELEPHONE.

"Prof. A. Graham Bell, the inventor of the telephone, lectured in Providence last evening; and in his little room at the top of No. 5 Exeter Place, Mr. Thomas A. Watson, the electrician, with several members of the press and a number of gentlemen interested in science, were assembled, for the purpose of holding communication with the professor, and demonstrating anew the practical workings of the instrument.

. . . .

"The *Globe* reporter remained with Mr. Watson until a late hour; and when the audience in Providence had been dismissed, and all the visitors had left the room in this city, he was repaid for his waiting by receiving the following message from a brother reporter of the *Globe*, who went to Providence especially to send a telephonic despatch: —

"'THE EXHIBITION IN PROVIDENCE.

"'*Special to the* GLOBE *by Telephone.*

"'PROVIDENCE, R. I , April 5.

"'The bad weather prevented the exhibition from being as effective as usual; still the audience which crowded Music Hall, and represented the best society of the city, had conclusive proof of the value of the invention. The transmission of musical sounds from the reed organ in Boston, giving "Music in Air," and other familiar tunes, was admirably perfect, and was heard distinctly all over the hall. The exhibition of singing was fairly successful; and Mr. Reeves's cornet solo, "Yankee Doodle," played at the request of one of the audience, was recognized very easily. The experiment of brass-band playing was not very successful. A conversation carried on between the Rev. Dr. Behrends here, and Mr. Watson at Boston, on the Rhode Island election, caused much merriment. Gov. Lippitt introduced Prof. Bell, who spoke till after ten o'clock, and remained in the hall an hour after, exhibiting the telephone to a curious crowd. An effort will be made to have the lecture repeated, when, it is

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hoped, circumstances will be more favorable for the working of Prof. Bell's invention.'

"NOTE. — On account of damage to the wires it was impossible to send as full a despatch as was intended; but fortunately the accident did not happen until after the lecture had been delivered, and Providence people had been satisfied of the success of the invention."

The following is an extract from a report of the lecture which appeared in the Providence *Daily Journal*, of April 6, 1877: —

"PROF. BELL'S LECTURE ON THE TELEPHONE.

"Music Hall was filled last evening, notwithstanding the storm, by one of our best audiences, to witness the first public exhibition of the speaking telephone in this city.

. . . .

"Prof. Bell stated that in vocal utterance it is best to remove the battery, and use nothing between the telephonic instruments in Boston and Providence. The Boston office was then telegraphed to cut out the battery. While waiting for this to be done, Prof. Bell explained in a few words the structure of his instrument and its history.

. . . .

"Mr. Watson next sung 'Hold the Fort,' which was switched on to the different telephones. Mr. Watson then repeated a sentence which was switched on to the telephones and generally heard. Rev. Mr. Behrends then interviewed Mr. Watson, asking him if it was stormy in Boston, also 'What time is it?' and 'Have you heard the news from Rhode Island?' Mr. Watson had not. Mr. Behrends informed him that we had an election yesterday, and 'Did you hear who was elected?' Yes, Mr. Watson had read it. 'What is the news in Boston?' Answer, 'I have not heard any.' 'Good night, Mr. Watson,' closed the conference.

. . . .

"The mysterious little box at Prof. Bell's lecture contains an apparatus almost elementary in its simplicity, which answers the double purpose of transmitting and receiving sounds. It may be divided into two parts, the artificial ear and the magneto-electric transmitter. The artificial ear may be likened to a grocer's sugar funnel, of tin or other metal (having a tube of about two inches diameter), the large flaring end of which has been sealed with a circular disk of thin sheet iron. This disk is the tympanum of the artificial ear. The two-inch tube is the part which projects from the box into which you talk, and at which you listen for a reply. Inside of the box there is a fixed U-shaped steel magnet, whose poles very nearly approach the sheet-iron disk, keeping it in a state of tension by virtue of magnetic attraction. Around the arms of the U magnet, near its poles, are bobbins of fine insulated copper wire, which communicate together, and one of the free ends of which connects with the telegraph wire outside, and the other with the ground, for the return current. For certain reasons it is thought better, in practice, to attach small, soft-iron cylinders, on which the bobbins are placed, to the poles of the fixed magnet; and the ends of these cylinders then take the place of the poles of the magnet, in close proximity to the iron disk or tympanum. This is virtually the whole apparatus. When a word is whispered into the two-inch auditory tube it causes the iron tympanum to vibrate. This disturbs the magnetism of the fixed magnet, and of its soft-iron cylindrical poles. This disturbance, in its turn, induces electrical currents in the coils of fine wire and in the telegraph wire outside. At the distant station these processes are then taken up in reverse order. The induced currents, passing from the telegraph wire through the coils of the receiving instrument, disturb the magnetism of the fixed magnet there, and that sets the disk in front of it in vibration, which communicates in turn the same sound undulations to the air which originated this curious series of transformations. In other words, the persons listening at the distant disk hear the same words, accents, tones, which were confided to the disk at the near station. It will be observed that the sound waves are converted first into mechanical vibrations of the disk, then into magnetic vibrations, then into electric currents, then back into magnetic vibrations, then into vibrations of the distant disk, and lastly into sound vibrations again, — and that these transmutations of the original sound waves between the two disks require four jumps through air spaces."

The *Sun*, *Tribune*, *Herald*, *World* and *Times*, of New York, of May 12, 1877, had long accounts of an exhibition of the speaking telephone by Prof. Bell, in the presence of Gen. Eckert, president of the Atlantic and Pacific Telegraph Company, President Gibbs, of the Dominion Telegraph Company, President Barnard and Profs. Newberry and Rood, of Columbia College, and many others, at the St. Denis Hotel. The following is the article from the New York *Tribune*: —

"An exhibition of the speaking telephone was given last night at the St. Denis Hotel, in this city. An invitation to exhibit the instrument here had been tendered to Prof. A. Graham Bell by Prof. F. A. P. Barnard, Dr. Howard Crosby, Prof. Henry Morton, and two or three dozen other gentlemen eminent in the learned professions or connected with telegraphy. Before beginning his proposed course of lectures, Prof. Bell invited a few of his scientific friends to be present at an informal exhibition, to show the power of the instruments. About fifty gentlemen were gathered in one of the parlors of St. Denis Hotel last evening. Among those present were President Barnard, Prof. O. N. Rood and Prof. J. S. Newberry, of Columbia College; the Rev. Dr. Armitage; Gen. Eckert, president of the Atlantic and Pacific, and the Hon. T. N. Gibbs, president of the Dominion Telegraph Company; Prof. Peet, of the Deaf and Dumb Asylum; Eastman Johnson, Gen. Gaylord, S. A. Bunce, R. H. McCurdy, F. O. Evans, and other well-known citizens. There was some delay about the proceedings, which was afterwards explained.

"Prof. Barnard introduced Prof. Bell to the audience, having become acquainted with the instrument and the inventor at Philadelphia. Prof. Barnard stated that of all the instruments of precision and research, etc., which the group of Centennial judges, of which he was chairman, was called upon to examine, there was none that occasioned greater interest or that they regarded as of higher novelty and importance than the speaking telephone of Prof. A. Graham Bell. In introducing Prof. Bell to the audience, Prof. Barnard said that he did so with the conviction that the name of the inventor of the telephone would be handed down to posterity, with a permanent claim on the gratitude and remembrance of mankind. Prof. Bell expressed himself as surprised at the size and importance of the gathering. He had at first expected only a small number of his friends, and had arranged to exhibit his telephone merely by placing one of the instruments in one room, and another in another room, in the hotel, connecting them by wires. But at a late hour he had determined upon a more complete exhibition of the character of the instrument, and had therefore sent his assistant, Mr. Gower, to Brooklyn, and hoped before long to hear that Mr. Gower had arrived somewhere in that city, and to hear it from Mr. Gower through the telephone. While Prof. Bell was speaking, a sound was heard from the instrument; he placed his ear against it, and after listening for a moment, said to the audience: 'It is all right. Mr. Gower has been in search of a cornet player, and thinks he will have one to play a tune for us.' Prof. Bell then carried on a brief conversation with Mr. Gower, finally desiring the latter to be in readiness after a short interval, in which Prof. Bell proposed to explain some features of the instrument to his audience.

"Prof. Bell mentioned many of the facts with which our readers are already familiar, as to the construction and character of the instrument. When a magnet approaches a bar of iron, it generates a current or a change of electrical condition in the iron; when it is drawn back it generates the converse electricity: *i. e.*, in the one case positive, in the other negative. What Prof. Bell had done was to substitute a sheet or plate of iron for the bar, to make that vibrate instead of the magnet, and to keep the magnet stationary. The vibration was communicated to the plate in front of the poles of the magnet by the waves of sound striking on the plate. These differences of positive and negative electricity, transmitted through the wire, caused a magnet at the other end of the wire to attract or repel a precisely similar iron plate; and the vibrations of that, communicated to the air, were sounds precisely corresponding to those presented at the first plate. He has tested it on two hundred and fifty-eight miles of wire between New York and Boston. He commenced by understanding it; now he does not understand it.

"The vibration was supposed to be like that of a membrane such as is that of the drum of the ear. But we all know that such vibration can be readily dampened by fastening upon the membrane something to stiffen it.

"There was no such result with the telephone when a wooden ring was screwed to the plate; or when the plate itself was made of extraordinary thickness, the vibration is molecular. The curious sounds heard in the telephone were described; some of them had been ascertained to proceed from earth currents. The instrument was more sensitive than a galvanometer to certain imperfections in the wire, or imperfect connections.

"The cornet player at last arrived. He was borrowed for a brief period from the orchestra of a neighboring theatre. He played two tunes, the latter one being very distinctly heard. When the note happened to strike the fundamental note of the telephone box it sounded abnormally loud. Otherwise it was fairly rendered. The voice in Prof. Bell's instrument sounds very much as though it had come through a very long speaking tube. Some practice is necessary to catch the words uttered, the vibrations giving a sort of confusing rattle. Nevertheless, the success of the transmission is unquestionable.

"After Prof. Bell finished speaking, the different members of the audience listened at the instrument, and some of them conversed with Mr. Gower, who was at the telegraph office, No. 340 Fulton Street, Brooklyn. Much laughter was occasioned by Prof. Bell getting the word 'Fulton' wrong after asking Mr. Gower where he was; Prof. Bell understood him to say 'Beacon Street,' perhaps having Boston in his mind. The proprietors of the St. Denis Hotel invited the visitors to a repast after the exhibition."

The first New York lecture was given May 17, 1877, at Chickering Hall, and long reports of it were in the New York *Herald*, *Tribune*, *World* and *Times* of the next day. These reports stated that President Barnard and Prof. Rood, of Columbia College, President Morton and Prof. Mayer, of the Stevens Institute, Mr. Cyrus W. Field, Mr. William Orton and Gen. Eckert, and Messrs. Preece and Wheeler (of the English Postal Telegraph) were present, and that Mr. Field spoke through the telephone to the operator at Brunswick.

The lecture in New York, at Chickering Hall, was preceded by the following request, the original of which is before me, which was published in the daily papers, and will be produced if required: —

"New York, April 7, 1877.

"Prof. A. Graham Bell, *Boston University:*

"*Dear Sir,* — The interest excited during the Centennial Exhibition by your experiments with your telephone, holding communications in audible speech with persons many miles away, and the published accounts of your improvements in the wonderful instrument, prompt us to request that you will deliver in our city, on some evening convenient to yourself, a lecture on sound and electricity, with an exhibition of your speaking telephone, showing what can be done by it, and making known its scientific and commercial value.

"Very truly, etc.,

"F. A. P. Barnard [*President Columbia College*].
Howard Crosby [*Chancellor of New York University*].
Henry Morton [*Stevens Scientific School*].
E. L. Youmans [*Ed. Popular Science Monthly*].
Cyrus W. Field [*Atlantic Cable*].
Thos. T. Eckert [*Pres. Atlantic and Pacific Tel. Co.*].
A. M. Mayer [*Stevens Scientific School*].
William Orton [*Pres. Western Union Tel. Co.*].
J. S. Newberry [*School of Mines, Columbia College*].
C. T. Chandler [*Prof. Chemistry, College Phys. and Surgeons*].
H. D. Noyes [*Prof. Aural Surgery, Bellevue College*].
Jno. W. Draper [*Prof. Chemistry, N. Y. University*]."

At Boston three lectures were given in the Music Hall in May, 1877, at the first of which Prof. Bell was introduced by Governor Gaston, and at each of them articulate speech was publicly transmitted. The exhibitions at Boston and Providence were reported in the principal newspapers; *e. g.*, Providence *Journal* of April 6, 1877, the Boston papers of April 6, and of May 5, 8, 9, of 1877.

The Boston lectures were preceded by the following, which was published in the daily papers, and will also be produced when required: —

"Boston, April 20, 1867.

"Prof. Alexander Graham Bell:

"*Sir*, — The undersigned, having followed with great interest the accounts of your discoveries and inventions in connection with the electric telephone, which have from time to time appeared in the newspapers, and confident that the general public of the city in which your researches have been made will be glad to witness a practical exhibition of your telephone under your direction, respectfully request you to gratify this desire of your fellow-citizens at such time and place as may be most convenient to you.

"Benjamin Pierce [*Prof. Mathematics, Harvard College*].
Joseph Lovering [*Prof. Physics, Harvard College*].
E. N. Horsford [*formerly Rumford Prof., Lawrence S. School*].
Henry W. Longfellow [*Cambridge*].
Geo. B. Emerson [*Boston*].
O. W. Holmes [*Boston*].
Charles W. Eliot [*President University at Cambridge*].
Alexander H. Rice [*Governor of Massachusetts*].
Nehemiah Gibson [*Boston*].
Frederick O. Prince [*now Mayor of Boston*].
William F. Warren [*Cambridge*].
John D. Runkle [*Mass. Inst. Technology and Naut. Al.*].
C. F. Adams [*Quincy*].
Wolcott Gibbs [*Prof. Lawrence Scientific School*].
Edward C. Pickering [*Prof. Physics Mass. Inst. Tech., now Director of the Observatory at Cambridge*]."

I will refer to the following publications, though I was not present on the occasions described: —

Dr. Henry Morton gave a lecture on the telephone, and an abstract of it is in the New York *Herald* of June 14, 1877.

The *Journal of the Telegraph*, March 1, April 1, April 16 and May 16, 1877, describe and refer to Mr. Bell's electric speaking telephone, and to Mr. Bell as the inventor thereof.

The *Popular Science Review*, an English publication, for 1877, page 429, has an article of four pages on electric speaking telephones, in which it says: —

"THE TELEPHONE. — During the recent session of the British Association at Plymouth, the lion's share of attention was unquestionably given to the telephone. Wherever the instrument was to be exhibited, whether in the physical or in the mathematical sections, or at Mr. Preece's popular evening lecture, there were always crowded audiences, eager to learn something about so novel an apparatus. At the *soirées*, too, the telephone stood above everything else as the centre of attraction, and knots of people were crowded round the instrument, anxious to converse with friends in distant apartments. The interest in this subject culminated on the arrival of Prof. Graham Bell, the inventor of the talking telegraph."

The Mr. Preece referred to is, I presume, Mr. W. H. Preece of the English Postal Telegraph, vice-president of the Society of Telegraph Engineers. A paper by him on the telephone was published in the *Philosophical Magazine* for April, 1878. It begins as follows: —

"The introduction of the speaking telephone, by Alexander Graham Bell, has supplied physicists with an instrument of research, as well as with an instrument of practical utility."

I have before me a pamphlet by Prof. W. F. Barrett, F. R. S. E., read Nov. 19, 1877, before the Royal Dublin Society, and reprinted from their *Proceedings*. It says: —

"The various attempts to communicate audible speech by means of electricity have culminated in the recent discovery by Prof. Graham Bell of the articulating telephone. The discovery was not the result of chance, but of long and patient endeavor. . . .

"These experiments revealed to Prof. Bell the important point that the transmission of speech by electricity could only be accomplished by using what may be termed an undulatory current; that is to say, one that merely varied in strength, without the occurrence of any actual interruptions which would give rise to a discontinuous or intermittent current. It is this principle of an unbroken current which distinguishes Bell's telephone from all preceding efforts.

"The electric currents in this telephone are in simple proportion

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to the motions of the air produced by the voice; and further, the electric waves sent to the distant extremity are (by a receiving arrangement precisely similar to the transmitting instrument) caused to reproduce motions of the air identically the same in character as those that gave birth to the currents. Thus, not only is articulation heard perfectly, but moreover, the different qualities of different voices are heard, so that at fifty or one hundred miles' distance the individuality of the speaker is transmitted as well as his ideas."

The *Scientific American* of Oct. 6, 1877, has a long article entitled "The New Bell Telephone." It is illustrated by large woodcuts of the hand telephone now in common use, and of the manner of using the same. Said article describes the structure of the apparatus, and its mode of operation. It concludes with the following paragraph: —

"The telephone has advanced considerably beyond the status of a 'beautiful scientific toy,' which many hastily pronounced it, and is now in constant use in numerous private lines in New York, Boston and Providence. Professor Bell recently exhibited it before the British Association at Plymouth, England, where it attracted great attention. It is at present manufactured by the Telephone Company of New York, Mr. Charles A. Cheever, manager, 32 Tribune Building, in this city."

I annex the opening paragraph of a long article, under the caption of "The Telephone," which appeared in the *Westminster Review* for January, 1878 (page 208): —

"Of all modern inventions connected with the transmission of telegraphic signals, the telephone, devised by Mr. Alexander Graham Bell, has excited the most widespread interest and wonder. Wherever Mr. Bell has appeared before the public to give an account of his invention and the researches which have led up to it, crowds have assembled to hear him. Nor is this astonishing; for the telephone professes not only to convey intelligible signals to great distances without the use of a battery, but to transmit in *facsimile* the tones of the human voice, so that a voice shall be as cer-

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tainly recognized when heard over a distance of a few hundreds of miles as if its owner were speaking in a room by our side. And the telephone does not fall short of its profession. Scientific men have had their wonder and curiosity aroused even more than the unscientific public, since a scientific man appreciates the enormous difficulties to be overcome before such an instrument can be realized. Had any hardy speculator a few years ago proposed a telephone which should act on the principle and be constructed in the form of Mr. Bell's instrument, he would have probably have been considered a lunatic." . . .

Int. 12. In Mr. Bell's deposition he speaks of the transmission of articulate speech from Boston to Providence, on the occasion of the lecture and exhibition at Providence, which you have described in your last answer; please to state whether you took any part in that transmission; and if so, what.

Ans. I was at the Boston end of the line, and had entire charge of the experiments by which the lecture was illustrated; and I conversed with a large number of people in Providence, and succeeded in making my voice audible to a large part of the audience at once.

Int. 13. Please state what, if anything, you had to do with the transmission from Providence to Boston of a report of the Providence exhibition, which was published in the Boston *Globe*, a copy of which you have already given.

Ans. I received it by telephone.

Int. 14. The account in the *Advertiser*, Oct. 9, 1876, of the use of the telephone between Boston and Cambridge, speaks of it as the first occasion where conversation was carried on over a telegraph wire. Is that strictly correct, or in what way did that use of the instrument differ from the uses you and Mr. Bell had previously made of it?

Ans. No; it was not strictly correct. Mr. Bell had several months previously, in Canada, carried on conversation over a telegraph wire; and before Oct. 9 we had often carried on conversation over a local circuit. The article in the *Advertiser* of Oct. 9, 1876, gives the first recorded conversation over a telegraph line.

[*Testimony as to use in Canada objected to as incompetent by counsel for Gray, and also by counsel for Edison.*]

Int. 15. What do you mean by the phrase "telegraph line," or "telegraph wire," as distinguished from a "local circuit"?

Ans. By telegraph line I mean one running out of doors. By a local circuit I mean a circuit connecting different points within one building.

Int. 16. I now call your attention to the use by Mr. Bell and his licensees of electric speaking telephones provided with metallic diaphragms; and I wish you would state some early instances of uses in public, or uses to which publicity was given, of instruments constructed with metallic diaphragms, and refer to the publications which describe such uses. Please answer, first, as to instances before April 1, 1877.

Ans. Referring to my answer to Int. 11, all the instruments used at the public exhibitions therein described, from Jan. 1 to April 1, 1887, had metallic diaphragms. In addition to that I will state some other uses of telephones with metallic diaphragms: —

Mr. Bell's magnet receiver, used as part of his speaking-telephone apparatus, exhibited and used at the Centennial Exposition, had a diaphragm entirely of soft iron. One like it, with a soft-iron diaphragm, was given by him to Sir William Thomson, and described by that gentleman in his address before the British Association in August, 1876, a copy of which, taken from the Boston *Daily Advertiser* of Sept. 25, 1876, has already been given. A description of the same, with woodcuts, is in the *Scientific American* supplement of Feb. 10, 1877. These woodcuts are reproduced in Mr. Prescott's book on the "Telephone," page 101, in a reduced size, and are given on page 241, *supra*. This thin metallic iron disk, in combination with the electro-magnet, is also described as the receiver used at the Centennial in the official report on awards, prepared by Sir William Thomson, already quoted on page 236, *supra*. I have already described and given some newspaper accounts of the use of Mr. Bell's telephone between Boston and Cambridge in October, 1876. Metallic diaphragms were then used in those instruments.

The instruments exhibited in operation before the Washington Philosophical Society, Jan. 13, 1877, had metallic diaphragms. An extract from a report of this in the Washington *Evening Star* of Jan. 20, 1877, has already been given.

All the telephones, the use of which has been mentioned in this deposition as occurring after that date, had metallic diaphragms. Among the uses of those telephones with metallic diaphragms, which took place in the presence of a large number of persons and received publicity through the newspapers, I mention the following, which are already referred to in this deposition: —

Report in Boston *Evening Transcript* of Feb. 1, 1877; report of lecture at Salem, Feb. 12, 1877, was transmitted by telephone, and which was transmitted and received in the presence of a large number of persons.

Another lecture at the same place, Feb. 23, 1877, was reported in the *Globe* of Feb. 24, 1877, the report transmitted by telephone in the presence of a large number of persons. At all the subsequent lectures mentioned in this deposition the public generally attended, paying admission fees; and large numbers of the audience were at liberty to, and actually did, transmit and receive articulate speech through telephones with metallic diaphragms. The character and construction of the diaphragm, and the fact that the *Globe* report was transmitted by it, is described and told in an extract from the *Globe* of Feb. 15, 1877, given in a former answer, page 256. Such telephones were publicly used in New York, May 11, 1877, and a description of the use and of the instrument, mentioning the iron plate, was given in the New York papers of the next day; an extract from the *Tribune* report has been given on page 267.

Other public uses of the speaking telephone with metallic diaphragms were made in New York, May 17, 18 and 19, 1877, and reports of their use are in the New York papers of the next day. These reports stated that the audience publicly transmitted and received speech by them.

Int. 17. Please state whether Mr. Bell and his associates made, with your knowledge, in the spring of 1877, any arrangements for the manufacture of electric speaking telephones, under his patents, and with metallic diaphragms for general commercial use; and if so, state whom they arranged with for their manufacture.

Ans. Mr. Bell and his associates made an arrangement with

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Charles Williams, Jr., of Boston, for the manufacture of such telephones some time previous to April 1, 1877.

Int. 18. Was any arrangement made with Mr. Williams to act as agent for Mr. Bell and his associates in putting out telephones for private lines; if so, what was the nature of the arrangement?

Ans. An arrangement was made prior to April 1, 1877, by which Mr. Williams obtained the right to supply the public with telephones made under Bell's patents. He was to be allowed a commission on all he leased.

Int. 19. Please state the first line that was put up in the vicinity of Boston for the use of such telephones on it; giving any extracts from newspapers or other publications which you may have relating to it.

Ans. Before April, 1877, a line of wire was built from Boston to Somerville, for the express purpose of being used with telephones. It is correctly described in the following newspaper extracts: —

BOSTON DAILY ADVERTISER.

April 5, 1877.

"The first telephone line that was ever established has just been constructed between the office of Mr. Charles Williams, electrician, in this city, and his house in Somerville, and a conversation can be carried on with perfect distinctness. Mr. Bell was in New York on Tuesday evening, and conversed readily over the regular wires with parties in this city. He lectures in Providence this evening on telephones."

BOSTON POST.

Thursday Morning, April 5, 1877.

"The telephone has been put into practical use; yesterday a line was opened from the office of Charles Williams, Esq., 109 Court Street, to his house in East Somerville. The great value of this invention is thus manifested, for by its uses Mr. Williams is now able to converse with his family when separated from them by fully three miles of distance."

THE BOSTON DAILY GLOBE.

APRIL 5, 1877.

"PERFECTING THE TELEPHONE.

"Prof. A. Graham Bell, the inventor of the telephone, had the pleasure of assisting at the opening of the first regular telephone line in the world, a private line between the place of business of a gentleman in this city and his residence in Somerville. The instrument worked admirably, and the enterprising gentleman is very much pleased with his private telephonic wire between town and home. The practical value of Prof. Bell's invention is being newly proved every day.

"While the professor was in New York recently, he communicated with his associate in Boston, Mr. Watson, and the telephone transmitted conversation over two hundred and eighty miles of space with wonderful clearness and distinctness of sound."

THE BOSTON HERALD.

APRIL 5, 1877.

"The first telephone line ever established has just been constructed between the office of Mr. Charles Williams, electrician, in this city, and his house in Somerville."

THE BOSTON TRAVELLER.

APRIL 5, 1877.

"The first telephone line ever established has just been constructed between the office of Mr. Charles Williams in this city and his house in Somerville."

The telephones used on this line had metallic diaphragms. The owners of Mr. Bell's patents were about to manufacture largely for general commercial use, and this line was constantly used for the public to talk over that they might be induced to buy or hire telephones. Such use by the public was made largely in April, 1877.

Int. 20. Please to describe some other lines that were used for Mr. Bell's telephones in April or the early part of May, 1877, and give any newspaper extracts you may have relating to them; and if you wrote and published any circular or advertisement relating to telephones for commercial use, please give a copy of it, and state generally what exertions were made in the way of putting telephones on the market for sale or on lease during May, 1877.

Ans. Between April 20 and 30, 1877, a line was built connecting the laboratory of Prof. Bell, No. 5 Exeter Place, with the office of Charles Williams, Jr., No. 109 Court Street; and about the same time, telephone connection was made between said laboratory and the office of Stearns & George, 37 Pearl Street. These lines were specially erected for the business convenience of the parties interested, and were fitted up with telephones, all of which had metallic diaphragms.

JOURNAL OF THE TELEGRAPH.

April 16, 1877.

"The first regular telephone line has been put in operation between the place of business of Mr. C. Williams, 109 Court Street, Boston, Mass., and his residence in Somerville, a distance of about three miles. Mr. Williams states that it works well, and that 'conversation can be carried on by it nearly as well as if in the same room.'"

About May 1, 1877, telephones with metallic diaphragms were put on a line connecting the office of Stone & Downer, 28 State Street, Boston, with the residence of one of the parties in Somerville, concerning which they addressed the following letter to Mr. Gardiner G. Hubbard, who at that time had charge of the business interests under the Bell patents: —

"Office of Stone & Downer, Custom-House Brokers and Forwarders, Dealers in Specie, Government Bonds and Stocks, Exchanges on the Provinces and San Francisco, 28 State Street, Boston, May 14, 1877.

"Gardiner G. Hubbard, Esq., Cambridge, Mass.:

"*Dear Sir,* — In reply to your inquiry regarding the use of the telephone, I would state that we placed them on our line between Boston and North Somerville some two weeks ago; we have used them constantly since with good success; in fact, we have become so used to them that we use them in preference to the 'Morse

System,' being able by the use of the telephone to transmit our messages much faster, and with a great deal less labor. We have experimented several times with musical instruments, and in each case have been attended with remarkable success; the playing of a piano being heard very distinctly, and no difficulty experienced in distinguishing the piece being played. We can certainly indorse the telephone as a success, and believe it can be used practically with many advantages over the old system of telegraphy.

"Yours respectfully,

"R. C. & F. W. Downer."

The inquiry of Mr. Hubbard referred to in said letter was with the view of drawing out a reply from the Messrs. Downer for publication, in a circular then in course of preparation, and which was immediately thereafter printed for general circulation and widely distributed, which circular was in the following words: —

"THE TELEPHONE.

"The proprietors of the telephone, the invention of Alexander Graham Bell, for which patents have issued by the United States and Great Britain, are now prepared to furnish telephones for the transmission of articulate speech through instruments not more than twenty miles apart. Conversation can be easily carried on, after slight practice, and with the occasional repetition of a word or sentence. On first listening to the telephone, though the sound is perfectly audible, the articulation seems to be indistinct; but after a few trials, the ear becomes accustomed to the peculiar sound, and finds little difficulty in understanding the words.

"The telephone should be set in a quiet place, where there is no noise which would interrupt ordinary conversation.

"The advantages of the telephone over the telegraph for local business are: —

"*First.* That no skilled operator is required, but direct communication may be had by speech, without the intervention of a third person.

"*Second.* That the communication is more rapid, the average number of words transmitted a minute by Morse sounder being from fifteen to twenty; by telephone, from one to two hundred.

"*Third.* That no expense is required, either for its operation, maintenance or repair. It needs no battery, and has no complicated machinery. It is unsurpassed for economy and simplicity. The terms for leasing two telephones for social purposes, connecting a dwelling house with any other building, will be $20 a year, — for business purposes $40 a year, — payable semi-annually in advance, with the cost of expressage from Boston, New York, Cincinnati, Chicago, St. Louis or San Francisco. The instruments will be kept in good working order by the lessors, free of expense, except from injuries resulting from great carelessness.

"Several telephones can be placed on the same line at an additional rental of $10 for each instrument, but the use of more than two on the same line where privacy is required is not advised. Any person within ordinary hearing distance can hear the voice calling through the telephone. If a louder call is required, one can be furnished for $5.

"Telegraph lines will be constructed by the proprietors if desired. The price will vary from $100 to $150 per mile; any good mechanic can construct a line. No. 9 wire costs 8½ cts. a pound, 320 pounds to the mile, 34 insulators at 25 cts. each; the price of poles and setting varies in every locality; stringing wire $5 per mile, sundries $10 per mile.

"Parties leasing the telephones incur no expense beyond the annual rental and the repair of the line wire. On the following pages are extracts from the press and other sources relating to the telephone.

"Gardiner G. Hubbard,
"Cambridge, Mass.

"May, 1877.

"For further information and orders address Thos. A. Watson, 109 Court St., Boston."

In addition to the foregoing this circular contained a long extract from the reports on awards of the judges of the Centennial Exhibition, Sir William Thomson, chairman; a series of resolutions adopted by the Essex Institute, Feb. 19, 1877, relative to the telephone; an extract from the Providence *Evening Press* of March 19, 1877, giving an account of successful experiments by Prof. Bell in talking through the telephone over a line forty-three miles long; an extract from the New York *Herald* of May 12, 1877, giving a description of an exhibition by Prof. Bell at the St. Denis Hotel; and the letter of Messrs. R. C. & F. W. Downer, above given in full. In the New York *Graphic* of Wednesday, May 23, 1877, appeared the following article relative to the practical use of the telephone, from which it is evident that this circular had at that date reached New York: —

THE DAILY GRAPHIC, NEW YORK.
WEDNESDAY, MAY 23, 1877.

"The telephone is quickly working out a practical application. A Boston company is prepared to furnish telephonic communication between places not over twenty miles apart. The advantages are thus set forth: No skilled operator employed; a little practice makes any one master of the telephone; communication more rapid, — the telephone transmits one or two hundred words per minute, the old telegraph apparatus averages not more than twenty; no expense required in its operation; no battery needed; two telephones connecting two houses may be leased for $20 per year. The company keep the instruments in working order. It must be understood that the rental mentioned above is for the use of the telephonic instrument. A telegraph line, when required, will cost from $100 to $150 per mile."

In the early part of May, 1877, an arrangement was made with the Cambridge Board of Water Works for putting up telephones on a line connecting their office in Cambridge with the works at Fresh Pond. This practical use of the telephone for public purposes was referred to as follows, in a Boston newspaper of May 19: —

THE BOSTON HERALD.
MAY 19, 1877.

"PRACTICAL USE OF THE TELEPHONE.

"A telephone is to be placed in the City Hall, Cambridge, in the office of the Water Board, to establish communication with the water

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works at Fresh Pond. A line of wire has been constructed, it being originally intended for the use of the printing telegraph. At the suggestion of Hon. Gardiner G. Hubbard, a telephone is to be substituted, that gentleman guaranteeing that the city shall be subjected to no expense unless the machine proves satisfactory."

THE BOSTON DAILY ADVERTISER.

MAY 19, 1877.

"THE FIRST PRACTICAL APPLICATION OF THE TELEPHONE.

"The Water Board of Cambridge has decided to have telephone communication with the water works at Fresh Pond, in order to facilitate the sending of messages. The board has accepted the offers of Mr. Gardiner G. Hubbard to place the telephone in operation, the city to be at no expense unless the arrangement proves satisfactory. Mr. Hubbard was formerly president of the board, and feels interested in having Cambridge first to apply the wonderful invention to public service."

In the early part of May, 1877, telephones with metallic diaphragms were put up on lines connecting the office of E. T. Holmes, Washington Street, Boston, with the banking house of Brewster, Bassett & Co., Congress Street, and the office of Charles Williams, Jr., 109 Court Street. These lines were intended to demonstrate the value of the telephone in connection with the burglar and fire-alarm systems of Mr. Holmes, and a public exhibition of the same was given on the seventeenth day of May following, notice of which appeared in a Boston newspaper of the next day. The telephones used on that line had metallic diaphragms.

BOSTON EVENING TRANSCRIPT.

MAY 18, 1877.

"THE TELEPHONE.

"Another successful series of experiments with the telephone was made yesterday afternoon at the rooms of Prof. Holmes, electrician, on Washington Street. At this place Mr. T. M. Carter played several cornet solos, which were distinctly heard at the rooms of

Messrs. Brewster, Bassett & Co., on Congress Street, at a branch office on Court Street, and in Somerville.

"In response, Mrs. Williams sang several songs in Somerville, which were plainly heard at these points above mentioned in this city; and singing from the Court Street office was heard in all the other places. Conversation was also carried on between the several points connected, with perfect ease."

On the eighteenth day of May, 1877, I personally put up a telephone in the office of H. L. Roosevelt, No. 40 West 18th Street, New York, connecting with another telephone supplied by Prof. Bell at said Roosevelt's residence, both of which had metallic diaphragms.

On Monday, the twenty-first day of May, 1877, in pursuance of an arrangement made some time prior thereto, I put up telephones, with metallic diaphragms, on a line in Altoona, Pa., going from New York specially for that purpose.

All the lines above referred to as erected in April and May, 1877, were put up for practical business purposes, and were so used from the date of their construction.

During the months of April and May, 1877, Mr. Hubbard was constantly negotiating for the disposal of exclusive privileges, territorial licenses, etc., under the Bell patents, and for supplying telephones with metallic diaphragms for commercial use. In April, or before, we made an agreement with Charles Williams, Jr., and the firm of Stearns & George, by which these parties acquired a right to the private line telephone business for Boston and vicinity within a radius of ten miles.

Before May 1, 1877, said Hubbard was negotiating with Charles A. Cheever and others to supply telephones to them for general commercial use in New York City; with Russell & Kinsman for their use in Boston; with E. T. Holmes for use of the telephone in Boston in his bank and express business; and with a great number of parties whose names I do not now recall, for territorial privileges in various parts of the country. The offers made to these persons by Mr. Hubbard in April and May were to furnish telephones to them to be used on lines which they were to put up for any customer who might apply.

Int. 21. Please state when the circular referred to in your last answer, or its contents, were advertised or made public.

Ans. Some time prior to May 16, 1877.

Int. 22. How do you fix that date?

Ans. The circular was prepared by Mr. Gardiner G. Hubbard, Mr. Bell's business manager, and an abstract from the circular was published in the New York *Graphic* of May 23, 1877, a copy of which has been given in my previous answer. These circulars were sent out by Mr. Hubbard from Boston; and as Mr. Hubbard had left Boston on May 16, to attend the lectures of Mr. Bell in New York on the 17th, 18th, and 19th, and on the 20th went to Altoona, Pa., with me to put up telephones, and went directly from Altoona to Washington, I am certain they were mailed before he left Boston.

Int. 23. Did you put up any electric speaking telephones with metallic diaphragms at Altoona, Pa., in May, 1877; if so, when and for whom?

Ans. I put up a set of such telephones Monday, May 21, 1877, for Mr. Gardner, superintendent of the Pennsylvania Railroad.

Int. 24. State, if you know, how early the arrangement to put up those telephones was made between Mr. Bell and his associates and the Pennsylvania Railroad, and when you received your directions to go to Altoona and put them up.

Ans. The arrangement was made before Mr. Hubbard left Boston, May 16, 1877; I received my instructions May 18 or 19.

Int. 25. Some extracts from the Cambridge and Boston papers of May 19, 1877, given in your previous answers, refer to Bell telephones used or to be used by the Cambridge Water Board: will you state when that arrangement was made, and how you fix the date?

Ans. The arrangement was made between Mr. Hubbard and the Water Board early in May, 1877. It was made before Mr. Hubbard left for New York, May 16, 1877.

Int. 26. One of your previous answers refers to telephones put up for Mr. Roosevelt, in New York, May 18, 1977: state whether or not you put them up or superintended putting them up, and how positively you can fix the date.

Ans. I put up one of them myself. Mr. Roosevelt put up the other. We immediately used the line and it worked very satisfactorily. I am able to fix the date, May 18, 1877, as the telephones were put up during the New York lectures, already mentioned; and the first and last days, the 17th and 19th, I was too busy to do anything but attend to preparations for the lectures.

Int. 27. State what kind of diaphragms were in the instruments you have described as having been made, furnished or put up between Jan. 1, 1877, and June 1, 1877.

Ans. The diaphragms in those instruments were composed entirely of soft iron.

Int. 28. The extracts from the *Advertiser* and the *Globe*, of April 5, 1877, given in your answer to Int. 19, refer to the transmission of articulate speech over the regular wires between New York and Boston a few days before. Please state whether or not such transmission took place, and whether you took part in it.

Ans. Such transmission took place as described. I was at the Boston end of the line, and talked with Mr. Bell in New York.

Int. 29. Please describe the telephone that was used on that occasion.

Ans. It was what was called a box telephone, consisting essentially of a large permanent magnet, with coils of wire on its ends and a diaphragm of soft iron, fastened on a wooden block behind a mouthpiece, and the whole covered with a thin wooden box. It is essentially like the drawing defendants' Exhibit Bell Telephone A, page 772, Vol. II. of the record in the Dowd case. That drawing, however, shows the instrument with its cover off in order to exhibit its interior. In practice a wooden cover like a box went over the whole interior part, which was screwed on to the base, and this is what gave it the name of box telephone. As we progressed, the telephones were gradually made neater and smaller. I have here before me on the table, box telephone No. 39, which was made in June, 1877. A sectional cut of this will be made part of my answer. In this the cores of the coils are prolongations of the magnet. They were afterwards placed on the side of the magnet, and the position of the

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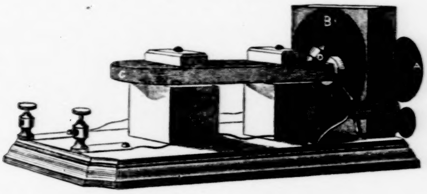
"BELL TELEPHONE A," page 772 of Dowd Case.

(RECORD, PAGE 286.)



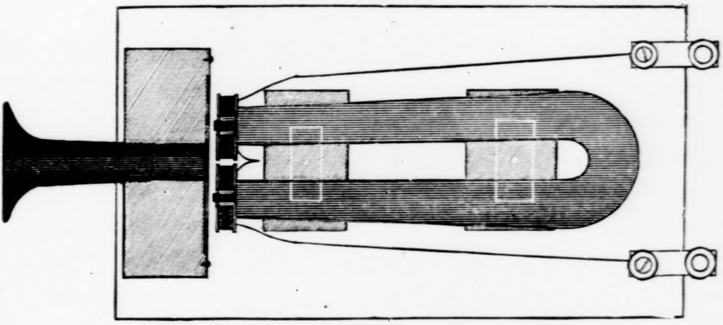
A. Speaking Tube.
B. Metallic Diaphragm.
C. Permanent Magnet.
D. Signal Call.

DIMENSIONS.

Length of permanent magnet	7¼ inches.
Length of spool	⅜ "
Diameter of spool	1⅛ "
Diameter of diaphragm	4¼ "
Length of speaking tube	3¼ "

BOX TELEPHONE (No. 39) OF JUNE, 1877.

(RECORD, PAGE 286.)



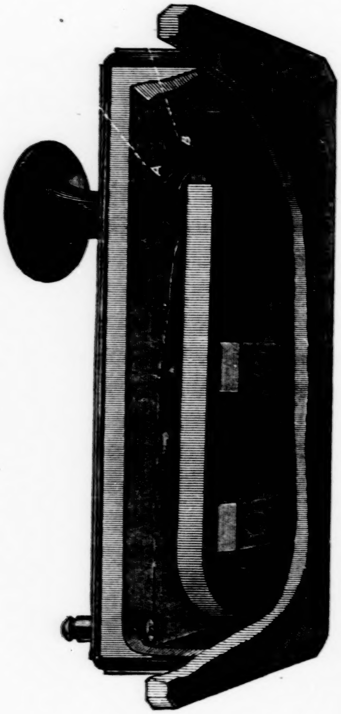
DIMENSIONS.

Length of permanent magnet (including core) . .	7⅝ inches.
" spool	¼ "
" core	5/16 "
Diameter of spool	1⅛ "
" core	¼ "
" diaphragm	4 3/16 "
" sound chamber	3⅜ "
Depth of sound chamber	1/16 "

AMERICAN BELL TELEPHO

BOX TELEPHONE (No. 251) OF AUGUST, 1877.

(RECORD, PAGE 291.)



A. Diaphragm broken off to show sound chamber.
B. Sound chamber.

DIMENSIONS.

Length of permanent magnet	7	inches.
" spool	$\frac{3}{8}$	"
" core	$\frac{7}{16}$	"
Diameter of spool	1	"
" core	$\frac{1}{4}$	"
" diaphragm	$4\frac{1}{8}$	"
" sound chamber	$3\frac{3}{8}$	"
Depth of sound chamber	$\frac{1}{16}$	"

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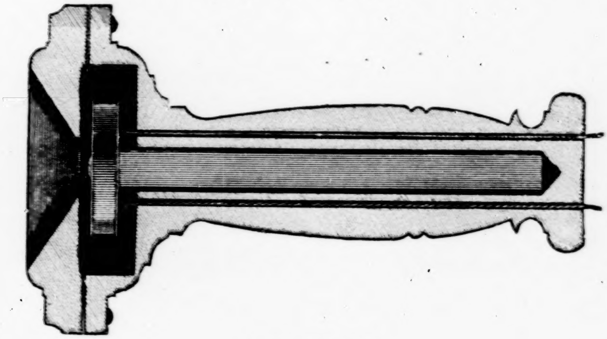
HAND TELEPHONE (No. 10) OF MAY, 1877.

(RECORD, PAGE 291.)

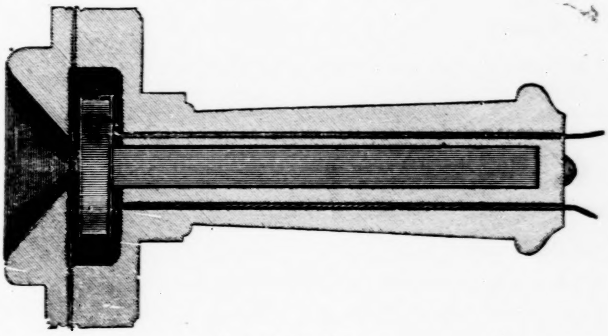


DIMENSIONS.

Length of permanent magnet	$4\frac{1}{4}$	inches.
" spool	$\frac{1}{4}$	"
Diameter of spool	$1\frac{1}{8}$	"
" diaphragm (in the clear)	$1\frac{3}{4}$	"

HAND TELEPHONE (No. 18) OF JUNE, 1877.

(RECORD, PAGE 291.)

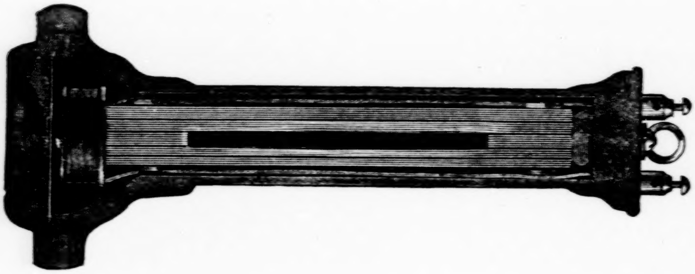


DIMENSIONS.

Length of permanent magnet	$4\frac{1}{16}$	inches.
" spool	$\frac{1}{4}$	"
Diameter of spool	$1\frac{1}{8}$	"
" diaphragm (in the clear)	$1\frac{3}{4}$	"

RUBBER HAND TELEPHONE, IN USE SINCE DEC., 1877.

(RECORD, PAGE 291.)



DIMENSIONS.

Length of permanent magnet	$4\frac{3}{4}$	inches.
" soft-iron core	$\frac{9}{16}$	"
" spool	$\frac{1}{2}$	"
Diameter of spool	1	"
" core	$\frac{1}{4}$	"
" diaphragm (in the clear)	$1\frac{3}{4}$	"

diaphragm and mouthpiece changed, so as to occupy the same position in relation to the cores as in No. 39. This much reduced the size of the instrument and allowed it to be screwed directly to the wall. The change was made about Aug. 1, 1877. I produce one, No. 251.

Those used at the lectures in the spring of 1877 were substantially like the exhibit, but were much larger. The first modification was to reduce the size of the box and the magnet; then to change the position of the cores on the magnet, and about the middle of May, 1877, we began to make the form of telephone known as the hand telephone. I have one here, which I now produce for inspection. No. 10 of the manufacturer's series of hand telephones was made in the last of May or first of June. I insert sectional cuts as part of my answer. In this telephone the magnet is a solid single-pole steel magnet, about four inches long. The core is about a quarter of an inch in diameter and half an inch long, formed by reducing the diameter of the steel magnet; with a coil about three eighths of an inch long and one and a quarter in diameter, of insulated wire. Resistance, sixty-five ohms. The diaphragm of thin soft iron about two inches in diameter. The whole is mounted in a wooden handle, similar in shape to a butter stamp, so that it can be easily handled.

After this form, No. 10, we modified the shape of the hand telephone, making it a little larger and a plainer shape, with a rather deeper flare at the mouthpiece. This change was made early in June, 1877. I produce one of this form, No. 18 of the manufacturer's series, a cut of which I insert as part of my answer.

About the middle of December, 1877, we gave up wood as a material for the handles of hand telephones, and adopted hard rubber of substantially the form now in use.

I will also add that about the middle of August, 1877, we changed from single bar magnets to compound bar magnets made up of several layers of magnetized steel, which was stronger and easier to magnetize than the single bar magnet.

My recollection is very strong that no hand telephones were actually put out for commercial use before the first of June, 1877, or within a few days of that time.

Int. 30. Will you state about how many magneto telephones are now in use in this country as transmitters?

Ans. About twenty-five thousand are so used, without counting those used in connection with Blake transmitters as receivers, which are often used as transmitters in case of temporary derangement of the Blake transmitters. I have in mind one instance of the use of magneto telephones as transmitters. The Massachusetts Institute of Technology has recently been fitted with telephones on lines connecting their various departments, — about twenty stations. At all these stations magneto telephones are used as transmitters and give perfect satisfaction.

Int. 31. Please state how many electric speaking telephones made by Mr. Bell, or his associates, under his patents, were in public and commercial use at the dates which I will indicate.

Ans. By June 30, 1877, about 164 hand and 70 box telephones were in public use.

By July 31, 1877, about 658 hand and 120 box telephones were in public use.

By Aug. 31, 1877, about 1,000 hand and 300 box telephones were in public use, all of which had metallic diaphragms of soft iron.

By Oct. 31, 1877, about 3,000 telephones in all were in use.

By June 1, 1879, over 33,000 were in use.

Cross Examination by W. D. BALDWIN, Esq., *of Counsel for Gray.*

Cross-Int. 32. Please point out any portion of Bell's patent of March 7, 1876, which in term specfies an electric speaking telephone.

Ans. I cannot find that the patent mentioned uses that term.

[*Adjourned.*]

MARCH 11.

Direct Examination resumed by MR. STORROW, *of counsel for Bell.*

Int. 33. Please state whether or not said patent states and shows an apparatus by which the same vocal sound that is uttered into the transmitter by the human voice is heard to proceed from the receiver without any limitation as to the character of the sound.

Ans. It certainly does.

Int. 34. Please state, as to the early telephones put out in April and May, 1877, whether written leases for them were executed at the time the instruments were furnished and put up, or whether the leases were executed subsequently; and state, if you recollect, the earliest date when any such leases were executed.

Ans. The leases were invariably executed from a week to a month later than the date of putting the instruments in use. The date of the first lease that was executed for telephones was June 8, 1877.

Cross Examination by L. W. SERRELL, Esq., *of Counsel for Edison.*

Cross-Int. 35. Please refer to the drawing marked "Exhibit No. 37 [25], Bell's Toronto drawing," and state at what time the instrument shown in the lower right-hand figure was first employed in the manner indicated in the writing under that figure.

Ans. Some time during June or July, 1875. Certainly not later than the middle of July, 1875.

Cross-Int. 36. Please refer to page 71 of Prescott's work on the Speaking Telephone, etc., 1879, and state whether or not the account given of the instrument, Fig. 49, corresponding with the sketch last referred to, is correct.

Ans. I do not consider that it is correct.

Cross-Int. 37. It appears to have been a statement made by Mr. Bell in his lecture before the Society of Telegraphic Engineers, Oct. 31, 1877: do you now think that your recollection of the operation of that instrument is more correct than the statements of Mr. Bell given over three years ago?

Ans. I do.

Cross-Int. 38. Wherein was Mr. Bell's statement then given incorrect, and when did you first find out that it was incorrect?

[*Question objected to, for the reason that it is a matter which the examining counsel should have examined Mr. Bell upon if he desired the information. Counsel for Mr. Edison replies that he had no reason to suppose his statements made at his lecture were incorrect, or else he should have asked Mr. Bell upon the subject.*

Counsel for Bell objects to remarks of counsel for Edison as im-

proper to go upon the record, and because, the subject having been fully gone into on Mr. Bell's examination, counsel refrained from cross-examining him.]

Ans. The results were entirely satisfactory to both of us, and Mr. Bell was greatly encouraged by the result of the experiment. I discovered that it was incorrect when I first read the lecture, about a month or two after it was delivered.

Cross-Int 39. Did you call Mr. Bell's attention, and if so, when, to the incorrectness of the statements he had made?

Ans. I think I did, immediately on his return from England, in the winter of 1878-9.

Cross-Int. 40. Please refer to Fig. 7 of Bell's first patent, No. 174,465, and state whether or not the instrument therein represented is the same one as that shown in Fig. 49 of Prescott's work before spoken of, and mentioned in Mr. Bell's lecture before the Society of Engineers.

[*Objected to on the ground that the figures speak for themselves.*]

Ans. Each of the figures referred to shows two telephones. The left-hand one of those in Fig. 7 of the patent is substantially the same as either of those shown in Fig. 49 of Prescott's book. The right-hand instrument of Fig. 7 of the patent differs substantially in the shape of the mouthpiece.

Cross-Int. 41. About how many instruments did Mr. Bell make with a membrane diaphragm, an electro-magnet and a hinged armature upon one pole of the magnet connected with the diaphragm similar to those shown in the figures referred to, regardless of the shape of the mouthpiece, before the end of 1877?

Ans. At least two.

Cross-Int. 42. Did Mr. Bell use, in connection with those instruments, mouthpieces in either of the forms shown in the drawings before referred to?

Ans. The mouthpieces, as I remember them, were similar to those shown in Fig. 7 of the patent. The instruments were constructed in such a manner that different shapes of mouthpieces could be attached.

Cross-Int. 43. Are you confident that such tubes or mouthpieces were used with these instruments?

Ans. I am.

Cross-Int. 44. Please refer to the drawing of the instrument Exhibit 40 [*Exhibit* 28, *p.* 233, *of pending case*], after page 75, Vol. II., of the Dowd case, and also to Figs. 51 and 59, pages 72 and 93 of Prescott's Speaking Telephone, and state whether or not those three figures are intended to represent the same instrument.

Ans. Figs. 51 and 59 of Prescott's work represent the same instrument, but the drawing Exhibit 40 [28 *of pending case*] represents a different instrument.

Cross-Int. 45. How many instruments like Exhibit 28 were made prior to the end of 1877?

Ans. I only remember one exactly like this figure.

Cross-Int. 46. What kind of a metal plate was used on the top of that instrument, and how was it fastened?

Ans. The metal plate was made of soft iron, about the same diameter as the top of the tube, and about two one hundredths of an inch thick, and the instrument was generally used with the plate laid on the top of the tube, and held there by the attraction of the magnet. We sometimes used a wooden mouthpiece, which fitted on the top of the tube and pressed upon the edge of the diaphragm. The wooden mouthpiece was used during October or November, 1876.

Cross-Int. 47. When was any instrument made with the plate fastened at one edge to the tube, and standing up at the opposite edge from the tube, as represented at Figs. 51 and 59 of Prescott's work, before referred to?

Ans. The first instrument of this kind that had the screw through the edge of the diaphragm was the one given to Sir Wm. Thomson, in the summer of 1876. The office of the screw was merely to prevent the diaphragm from being lost.

Cross-Int. 48. When the screw was tightened, did not the opposite edge of the disk or diaphragm rise above the top of the tube?

Ans. I am very certain that it did not.

Cross-Int. 49. Do you know who furnished the drawings of these instruments that have been put in Mr. Prescott's said work as being part of Mr. Bell's London lecture?

Ans. I do not.

Cross-Int. 50. How many instruments substantially like Fig. 51, in Prescott's work, were made before the end of 1877?

Ans. I perfectly remember three.

Cross-Int. 51. On about how many occasions during 1876 was an instrument made use of corresponding to Fig. 7 of the Bell patent No. 174,465?

Ans. Such an instrument was used constantly during the experiments made by Mr. Bell in the summer of 1875. It would be impossible to say on how many occasions it was used, as I have no doubt it was used a dozen times a day on some days. In 1876 the instrument had been improved, and I do not remember this exact form being used at any time during 1876.

Cross-Int. 52. What was the next or improved form of the instrument spoken of in your last answer?

Ans. That shown in Fig. 58, page 93, of Prescott's work.

Cross-Int. 53. When was this first used?

Ans. In the early summer of 1876. This is one of the forms that was used at the Centennial.

Cross-Int. 54. Please refer to Fig. 3, on pages 1 and 2 of Vol. II. of the Dowd telephone suits, and state whether or not the hole in the top of the case there represented is the same hole in the case that was held to be detrimental, as was spoken of in answer to Int. 50, on page 546, Vol. I., of the Dowd telephone suits [page 211, *supra*].

Ans. The hole in the figure is in a similar position in relation to the diaphragm, and would have the same detrimental effect as those holes spoken of in answer to the interrogatory inquired upon.

Cross-Int. 55. On page 551, Vol. I., of the Dowd telephone suits, do I understand correctly that your experiments led you to understand that there is no difference between a speaking telephone when a tube is used of some considerable length for the sound to travel through between the diaphragm and the operator, and one having only a flaring opening, as shown in the drawing complainants' Exhibit 25 [46 *of pending case*], following page 49 of Vol. II. of the telephone suits?

Ans. If the tube is not more than a foot long, and about five eighths of an inch internal diameter, there would be no practical difference. This I know from experiment.

Cross-Int. 56. Suppose the tube was smaller than five eighths of an inch in diameter, what would be the operation?

Ans. I have never used a tube smaller than about three eighths of an inch internal diameter, and such a tube worked perfectly satisfactorily.

Cross-Int. 57. Suppose that the tube was more than five eighths of an inch in diameter, what then do you find?

Ans. If it were considerably more in diameter, it would be apt to give a booming quality to the articulation.

Cross-Int. 58. Was any such booming sound noticeable upon the instrument corresponding with Fig. 7 of the Bell patent No. 174,465, or the receiver No. 2, following page 49, Vol. II. of the telephone suits, or Exhibit No. 22, or Exhibit No. 38, following page 75, or Exhibit No. 39? [*Exhibits* 43, 26, 27 *of pending case.*]

Ans. The articulation of these instruments was always characterized by what I term a "booming" quality.

Cross-Int. 59. Do you consider that booming quality detrimental to such an extent as to interfere with the practical use of the telephone?

Ans. Had we no better telephones at the present day, we could use practically any of those mentioned in Cross-Int. 58.

Cross-Int. 60. On page 550, Int. 71, of your testimony of Vol. I. of the telephone suits [page 215, *supra*], you speak of the battery being discarded in December, 1876: why was it discarded?

Ans. Because, about the time mentioned in that answer, we made such improvements in the permanent magnet telephone that the results obtained from such telephones were superior to those obtained from telephones in which the magnetism was produced by an electric current from a battery in the circuit.

Cross-Int. 61. About when, after December, 1876, did the Bell Company introduce batteries in their telephone circuits?

Ans. About November, 1878, telephones were introduced by the owners of Mr. Bell's patent that required the use of a battery in connection with them.

Cross-Int. 62. Tell us what telephones those were.

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Ans. What is known as the Blake transmitter.

Cross-Int. 63. Is it a fact, then, that previous to the introduction of the Blake transmitter, the Bell Company had only used magneto transmitters and receivers without a battery?

Ans. It is a fact.

Cross-Int. 64. How long before the introduction of the Blake transmitter had other parties — such, for instance, as the Gold and Stock Telegraph Company — used transmitters with a battery, as far as you know?

Ans. As nearly as I can remember, one or two months.

Cross-Int. 65. About how many telephones has the Bell Company now in operation in the different cities and places under its license; and what proportion of those instruments are in circuits provided with batteries, and what proportion without batteries?

Ans. The Bell Company has about 150,000 telephones in use under its license in the United States, of which about 60,000 have batteries used in connection with them; the rest are magneto telephones which are not provided with batteries.

Cross-Int. 66. About how many magneto telephones are in use upon circuits in which batteries are provided for use when desired?

Ans. About 90,000.

Cross-Int. 67. About how many magneto telephones are in use upon circuits in which batteries are not provided at all, directly or indirectly?

Ans. Somewhat more than 25,000.

Cross-Int. 68. Is it not a fact that in cities where there are numerous lines adjacent to telephone lines, that the magneto telephone without any battery in the circuit is very liable to indicate false sounds?

Ans. No more so than with the battery.

Cross-Int. 69. Is it not a fact that in instances where a carbon transmitter and a battery are made use of under the circumstances required in the last question, the sounds are much more clear and distinct than they are when a magneto transmitter is made use of?

Ans. The carbon or battery transmitter of any kind will undoubtedly transmit sound more loudly than a magneto transmitter; but

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either could be and is used under the circumstances described in Cross-Int. 68.

Cross-Int. 70. Is it not a fact that telephone instruments in which batteries and carbon, or similar transmitters, are employed, are less liable to detrimental influences by inductive currents than the magneto instruments?

Ans. The only effect of inductive currents on a telephone circuit that would be detrimental to its working is the noise produced by such currents in the receiving telephones connected with such circuit. This noise would be no greater if a magneto telephone was used as a transmitter than if a battery transmitter was used.

Cross-Int. 71. When a battery transmitter is used under the circumstances spoken about in your last answer, do the noises interfere with the reception of the message as much as they do when a magneto transmitter is used?

Ans. They do not.

Cross-Int. 72. And is that the reason why the battery transmitters have been as extensively used as indicated in your previous evidence?

Ans. That is one reason.

Cross-Int. 73. Have you made any careful experiments by which to ascertain the comparative merits of the Edison carbon transmitter and the Blake carbon transmitter, taking into account the reliability of the adjustment, the tendency to change under different atmospheric conditions, the quality of the articulation at the receiving instrument and the relative cost of construction?

Ans. I have made many such experiments, and am familiar with the relative cost.

Cross-Int. 74. Is it not a fact that in the Blake transmitter the electrodes are liable to separate where a loud talking or shouting takes place at the instrument?

Ans. This is a defect common to all battery transmitters, and the Blake transmitter is no more affected that way than any other.

Cross-Int. 75. Do you know whether in the Edison carbon transmitter the electrodes will separate under the circumstances inquired of in the last question?

Ans. It will, under certain adjustments.

Cross-Int. 76. Please answer my previous question under the supposition that the Edison instrument is adjusted in the most approved manner by a competent person.

Ans. The most approved method of adjusting an Edison transmitter is undoubtedly to make the pressure of one electrode against another so great that it would not separate under the influence of shouting. This necessitates placing the lips close to the mouthpiece when talking to it. In practice this is inconvenient, and the transmitter is often adjusted with the electrodes pressing less tightly, so that the lips need not be placed so closely to the mouthpiece. Under the latter adjustment the electrodes would separate if spoken to loudly with the lips touching.

Cross-Int. 77. Have you ever known of any instance where the electrodes in the Blake transmitter have been injured by an electric spark passing when the electrodes were separated?

Ans. I have never known an instance of the Blake transmitter being injured that I have traced to this cause.

Cross-Int. 78. Have the Bell Company ever manufactured the Edison carbon transmitter themselves; and if so, to what extent?

Ans. The Bell Company do no manufacturing whatever. The Bell Company have ordered about five hundred from the Western Electric Manufacturing Company since November, 1879. These were ordered shortly after the Bell Company obtained control of the Edison patents.

Cross-Int. 79. Is it not a fact that the Bell Company now has the entire control of the telephone business so far as the Edison, Blake, Bell and Gray inventions are concerned, and can supply whichever instrument they see fit to their customers?

Ans. It is a fact that the Bell Company has such control; but it has to supply such telephones as are called for by its agents.

Cross-Int. 80. About how many Edison carbon transmitters were turned over to the Bell Company at the time of the consolidation in November, 1879?

Ans. Between 15,000 and 20,000.

Cross-Int. 81 And about how many of them are now in use?

Ans. I should judge about one half that number.

Cross-Int. 82. Is the article in the *Scientific American*, Sept. 9, 1876, a correct statement of the extent of success obtained by Mr. Bell at that time?

Ans. It is, I think, substantially correct. The first part of it refers to experiments made several months previous.

Cross-Int. 83. In the trial of the telephone for articulate speech on a telegraph line, which was stated was on the 9th of October, 1876, referred to in your answer to Int. 14, what kind of instruments were made use of?

Ans. Both instruments used in the experiment described in the article from the *Boston Advertiser* of Oct. 9, 1876, were substantially the same as complainants' Exhibit No. 38, Bell's Single Pole Centennial Membrane Telephone [*Exhibit 26 in pending case*], following page 75 of the Dowd suit, Vol. II. But the mouthpieces were omitted.

Cross-Int. 84. Were the instruments made use of in the trial between New York and Boston, April, 1877, at both ends alike? And state whether or not any battery was used on the line.

Ans. They were substantially alike, and no battery was used.

Cross-Int. 85. State whether or not the magnet was adjustable.

Ans. It was.

Cross-Int. 86. And in what respect was it similar to the magnet shown in Bell's patent of Jan. 30, 1877, No. 186,787?

Ans. It had precisely the same adjustment as that shown in Figs. 2 and 3, but had a horseshoe magnet instead of a bar magnet.

Cross-Int. 87. When first did Mr. Bell make use of an iron diaphragm?

Ans. One of the telephones exhibited at the Centennial, in July, 1876, was the first instrument I know of that had an iron diaphragm.

Cross-Int. 88. When first did Mr. Bell make use of an iron diaphragm with a case or mouthpiece intervening between the diaphragm and the mouth of the speaker or the ear of the listener?

Ans. In August, 1876.

Cross-Int. 89. Please refer to the instrument shown in Figs. 2 and 3 of Bell's patent, No. 186,787, and state when first such an instrument was made.

Ans. It was made about the middle of October, 1876.

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Cross-Int. 90. To what extent have instruments like those shown in the said figures of the patent been made or used?

Ans. I consider that all the magneto telephones that the Bell Company has in use are substantially like the telephones shown in Figs. 2 and 3 of that patent, the difference being chiefly in the case and shape of the mouthpiece. Not over a dozen telephones exactly like those shown have ever been manufactured.

Cross-Int. 91. So far as the rights of the Bell Company relate to the invention of Mr. Bell, as now made use of by the company, is there any other patent or application of Mr. Bell, other than the two patents now in interference, which shows any device or invention of Mr. Bell?

Ans. There are at least two other patents that I have in mind of Mr. Bell's, that relate to speaking telephones that are the property of the Bell Company, one of them No. 228,507, June 8, 1880. The subject matter of that patent is not now made use of by the company practically.

Another, No. 220,791, Oct. 21, 1879, is made use of to a limited extent.

Another, No. 213,090, March 11, 1879, which is not used practically by the company.

Another, No. 201,488, March 19, 1878, which is not used practically by the company.

Cross Examination by GEO. W. DYER, Esq., *of Counsel for Voelker.*

Cross-Int. 92. In July, 1879, I suppose that you had gone to a pretty large extent into the manufacture of telephones, and had abundant machinery and skilled workmen in your employ; and at that time had acquired a good deal of skill in the construction and the manipulation of telephones?

Ans. Nearly all the telephones that the Bell Company have in use have been made by contract with Charles Williams, Jr., Boston. The workmen who make them are consequently in his employ. I consider that I was well posted at that time in all the mechanical and electrical branches of the telephone business.

Cross-Int. 93. What connection had you with the works of Williams?

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Ans. I have no direct connection with Mr. Williams's works, but my duties as general inspector and engineer of the telephone company necessitate my spending considerable time at his works. I am and have been entirely in the employ of the owners of the Bell patents since August or September, 1876.

Cross-Int. 94. Since that time, have the telephone instruments been made under your direction and inspection, or either direction or inspection?

Ans. They have been made almost entirely under my direction and inspection. I have and have had assistant inspectors, whose duties are to examine details.

Cross-Int. 95. Have you determined forms, sizes and arrangement of parts in the telephones made under your direction at Williams's works?

Ans. I have, to a great extent.

Cross-Int. 96. What other person has to any less extent?

Ans. Mr. Francis Blake, the inventor of the Blake transmitter, and Mr. Emile Berliner, have suggested sizes, and forms of details to a certain extent; and I have accepted their suggestions. This applies merely to the manufacture of telephones, and not to ther invention.

Cross-Int. 97. Have you determined materials, as well as forms, etc.?

Ans. Almost entirely, where there has been any choice of materials.

Cross-Int. 98. In the summer of 1879 had you the skill and experience which would enable you to manufacture a telephone capable of use in transmitting and receiving articulate speech, if such capacity had existed in the invention of that telephone?

Ans. In the summer of 1879 I had sufficient skill and experience to make any form of speaking telephone, as well as any other man I know of.

Cross-Int. 99. In the experiments related by you in your testimony in the summer of 1879, with instruments wholly reproduced, or reproduced in large measure, did you bring to bear your best skill in the manipulation of such instruments?

Ans. I do not think I did. I did not make the instruments at all; merely examined them after they were made, and used them without any special adjustment as they came from the workmen's hand.

Cross-Int. 100. What was the purpose of the lectures and exhibitions stated by you in answer to Int. 10; covering the time from Jan. 13, 1877, up to May, 1877?

Ans. The only purposes that I know that Mr. Bell had in giving those lectures and exhibitions were to raise money by admission fees, and to prove the practicability of the instrument.

Cross-Int. 101. Referring to that part of your answer to Int. 20 relating to putting telephones on a line for Stone & Downer, do you know upon what terms or conditions telephones were put up on that line?

Ans. They were to be paid for at our regular rates, if satisfactory; and they were, I think, afterwards paid for.

Cross-Int. 102. Do you know how long after?

Ans. I think it was several months; but as I have had nothing to do with the financial branches of the telephone company's business, it will be impossible for me to say without reference to their books.

Cross-Int. 103. Were the telephones on that line changed during their use by Stone & Downer?

Ans. They were. It was the custom of the company to exchange telephones, when improvements of any importance were made. That custom has continued to the present day.

Cross-Int. 104. Was that change made before Stone & Downer paid?

Ans. I cannot positively say, but I think not.

Cross-Int. 105. Were the terms of compensation by Stone & Downer, in accordance with the circular of Mr. Gardiner G. Hubbard, set out in full in your deposition?

Ans. I think they were, substantially.

Cross-Int. 106. When were the telephones put on the line between the offices of the Board of Water Works at Cambridge?

Ans. In May, 1877, shortly after the publication of the articles in the Boston *Herald* and Boston *Advertiser* of May 19, 1877, which are given in my testimony.

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Cross-Int. 107. Do you know upon what terms or conditions these telephones were furnished?

Ans. They were to be paid for, if satisfactory, at our regular rates, substantially as stated in the circular already mentioned.

Cross-Int. 108. Do you know who furnished this article to the Boston *Daily Advertiser* of May 19, 1877, or the material for it?

Ans. I do not.

Cross-Int. 109. Were the telephones put up on the line to Prof. Holmes's, connecting with Brewster, Bassett & Co.'s bank, put up on the same conditions as those just mentioned of Stone & Downer and the Cambridge Water Works?

Ans. No. Under the arrangement we had made or were about to make with Mr. Holmes, he was to have the right to place telephones on the lines connecting his central office with the various banks throughout the city of Boston; Mr. Holmes was to pay us a rental of $10 for each telephone per annum, he collecting a larger sum than that from the banks for the use of the telephone and line, and services rendered in connecting one bank with the other as they might desire. The title of Professor is erroneously applied to Mr. Holmes. He was the general manager of the Holmes Burglar Alarm Telegraph Company, and he was to use the telephones on his line wires.

Cross-Int. 110. Was he to pay for those telephones whether they were satisfactory or not?

Ans. He satisfied himself of the practicability of the telephone before beginning negotiations with the owners of the Bell patents, as the introduction of the telephones on his burglar alarm wires necessitated quite an expense for alterations, which expense he met; and I think the first telephones he had, he expected to pay for: but had they not been satisfactory, we should certainly not have asked for pay any more than from the preceding gentlemen.

Cross-Int. 111. What was the first instance when telephones were furnished for commercial use without conditions?

Ans. It was our practice, during nearly the whole of 1877, to allow agents to put out telephones and let their customers try them for a few weeks, before requiring payment, giving them the right to return if unsatisfactory. The chief reason why we did this was the great doubt that existed in everybody's mind, when first approached to leave a telephone, as to whether it was possible to do such a wonderful thing as to transmit articulate speech over a telegraph wire. As this doubt wore off, we began to require payment as soon as the telephones were put in working condition. At the present time we would not require any customer to keep a telephone that he was not satisfied with. The first lease that was executed and payment made for telephones was, as I have already testified, dated June 8, 1877. These instruments were put into use about one week previous to that time.

THOMAS A. WATSON.

March 11, 1881.

Subscribed and sworn to before me,

Charles H. Swan, *U. S. Commissioner.*

LEPHONE COMPANY,-3

AMERICAN BELL TELEPHON

Boston, Aug. 28, 1882.

Present: James J. Storrow, Esq., *of Counsel for Complainants;*
L. Hill, Esq., *of Counsel for Defendants.*

Before me,
CHARLES H. SWAN, *Examiner.*

Further Examination of Mr. Watson *by* J. J. Storrow, Esq., *of Counsel for Complainants.*

Int. 112. In the twenty-fourth answer in your first deposition here stipulated in from the Dowd case and given July 15, 1879, and found on p. 205 of complainants' printed record, instead of describing the circuits you used on the 5th of July, 1879, you referred for a description of them to a deposition in the Dowd case instead of repeating that description at length. As that deposition is not here in evidence, I wish you would describe the arrangement of those circuits and the position of the instruments, referring, if you please, for the purpose of refreshing your memory, to the same paper you referred to in giving that deposition.

Ans. The transmitter was placed in Room 42, Union Building, State Street, Boston, and the receiver in the office of Mr. J. J. Storrow, in the same building, a story lower. The two rooms were separated by an open court about one hundred feet long, across which the wires run. A metallic circuit was used. There was also a second circuit running between the two stations, on which two ordinary hand telephones were connected to verify the results obtained from the other telephones.

[Note. — Mr. Watson's sixty-sixth answer, p. 214, adopts, as his statement of certain experiments, a passage from another deposition in another case; that deposition is not in evidence in this cause, but the specific answers so adopted by Mr. Watson are reprinted as a part of his sixty-sixth answer.]

Int. 113. Your eightieth answer adopted, as a part of it, a portion of the contents of a deposition in another case which is not here in evidence. For that reason I shall desire to have you give now a statement concerning those experiments. To begin with, please state, first: What was the general arrangement of the two stations and of the circuits on which, on the 2d of June, 1879, at No. 40 State Street, Boston, you tried the instruments complainants' Exhibits 36 and 37; Exhibits 38 and 39, Baby Membrane Telephones; Exhibits 40 and 41, Lovers' Electric Telephones?

Ans. The circuits and arrangement of instruments were the same as described in my one hundred and fiftieth answer.

Int. 114. Did you speak into the instruments, or did you listen, or did you do both?

Ans. I did both.

Int. 115. State whether or not those instruments at that trial transmitted articulate speech well enough to be of any practical utility.

Ans. I think they did. I have already testified that if there were no better instruments these could and would be used practically, in my opinion.

Int. 116. In your one hundred and fiftieth answer you testified that you used a second circuit with two ordinary hand telephones to verify the results obtained from the other telephones: did you so verify the results in the experiments now inquired of?

Ans. The results were verified through the hand telephones.

[*Memorandum.* — The Mr. Wilson referred to in Mr. Watson's one hundred and eighth answer, p. 222, is a witness who testified in the Dowd case, but who has not yet testified in this case, and whose deposition has not been stipulated into this case.]

Int. 117. In your fifty-first answer, p. 211, and elsewhere, you referred to Mr. Edward Wilson: does Mr. Wilson live in this country now?

Ans. He does.

Int. 118. How long since he returned from living abroad?

Ans. He returned about three months ago.

[NOTE. — Mr. Edward S. Renwick, referred to in Mr. Watson's fifty-second answer, p. 211, was a witness called by the defendants in the Dowd case. He has not been called as a witness in this case, nor has his deposition been put in evidence.

Counsel for defendants states that the stipulation, agreeing to admit the depositions of Mr. Bell and Mr. Watson taken in other suits and legal proceedings to be used as evidence in this case, was only intended to admit as evidence the statements of the two witnesses, Mr. Bell and Mr. Watson, and was not intended to admit as evidence here the depositions of any other persons that may have been referred to by them in the course of their depositions; and defendants' counsel objects to the use of any portion of Mr. Cross's deposition and Dr. Blake's deposition, referred to in the deposition of Mr. Watson taken or stipulated into this case, for the reason that the statements of Mr. Cross and Dr. Blake are merely hearsay.*]

Int. 119. In your answer to Int. 36, p. 208, you referred to Mr. Bell's Centennial instruments, which, you said, were made by you personally, and drawings of which are found on pp. 232–234 of your second deposition, and on pp. 32–34 of complainants' volume of exhibits. I wish you would tell me how the membrane diaphragm and brass frame carrying it in the magneto-membrane telephones there shown, Exhibits 26 and 27, compare with the membrane diaphragm and brass rings carrying the same in the liquid transmitter, Exhibit 29.

Ans. They were precisely similar, castings from the same patterns being used for both sets of rings.

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* The depositions of some of said witnesses were afterwards taken in this cause.

EPHONE COMPANY,-3

Int. 120. If you have any memorandum of articulate speech transmitted by you and Mr. Bell with a liquid transmitter in March, 1876, will you please read it?

Ans. I have such memorandum, from a note book I was using at that time. It reads as follows: —

"MARCH 10, 1876.

"'Mr. Watson, come here: I want you. How do you do? God save the Queen,' and several other articulate sounds."

Int. 121. When you heard that at the receiver, who was speaking into the transmitter?

Ans. Mr. Bell.

Int. 122. Where was the experiment?

Ans. Between two rooms at Mr. Bell's laboratory, No. 5 Exeter Place.

Int. 123. What liquid, if you remember, was used?

Ans. Water, with a little sulphuric acid in it.

Int. 124. Of what material, if you remember, was the wire which was attached to the membrane and dipped into the liquid?

Ans. Platinum.

Cross Examination by L. HILL, Esq., *of Counsel for Defendants.*

Cross-Int. 125. Please describe all the conditions of the circuits and the instruments in the experiments referred to in your last answer.

Ans. The two rooms were situated at each end of an entry about twenty-five feet long, with an ordinary annunciator wire connecting the two. In one room an instrument similar to Exhibit 29, Centennial Liquid Transmitter, was connected to this wire, and at the other end was what is known as a harmonic receiver. The circuit was completed by the gas pipe. Mr. Bell spoke at the transmitter and I listened with my ear pressed to the spring of the harmonic receiver. What is known as the electro-poion battery was used and I do not remember exactly how many cells. Mr. Bell had twelve or fifteen cells in his laboratory, and my impression is that only three or four were used.

Cross-Int. 126. Please describe the instrument known as the harmonic receiver which you refer to.

Ans. It consisted of an L-shaped piece of iron, the legs of which were about two inches long, having on one end the coil and core of an electro-magnet, and clamped to the other a piece of steel clock spring, which projected over and near to the end of the coil. The whole was mounted on a base of black walnut with two binding posts, to which the terminals of the coil were connected.

Cross-Int. 127. How did that instrument compare with the instruments shown at the ends of the circuit in Fig. 5 of Bell's patent of March 7, 1876?

Ans. It was precisely similar, with the exception that the figure referred to is not mounted on a base.

Cross-Int. 128. Give the dimensions of the clock spring used on the instrument, as accurately as you can.

Ans. I do not remember the exact dimensions, as Mr. Bell had a large number of these receivers with different springs. The clock spring that he used mostly was from three fourths to one inch in width, and about one fiftieth of an inch in thickness. The length I do not remember; it could not have projected over the core more than three or four inches, and certainly must have covered the core.

Cross-Int. 129. I do not understand how the spring could have projected over the core three or four inches, when the legs of the L-shaped arm were only two inches in length. Will you please explain?

Ans. The only physical thing that would limit the length of the spring would be the size of the room that the instrument was contained in.

Cross-Int. 130. In said Fig. 5 in Bell's patent, the spring is represented as projecting over the core just far enough to cover it, and as corresponding substantially in length to the length of the lower leg of the L-shaped arm. Fig. 5 you say is a correct representation of the instrument which you used. What I want to know is, how the spring, if the instrument was constructed as shown in said Fig. 5, could extend over the core three or four inches.

Ans. In my answer to Cross-Int. 127, I should have excepted the length of the spring, as I have no recollection of the precise length of the spring on the instrument referred to used in the experiment. I only know that Mr. Bell had harmonic receivers with springs of various lengths, and that one of these was used.

Cross-Int. 131. I noticed that the words which you say were transmitted through that apparatus at that time, and recorded by you in a memorandum book, were not read by you from a book but from a sheet of paper apparently new: why do you not produce the memorandum book itself?

Ans. I have the memorandum book at home. Not having been at home for several days, I did not have it with me to-day for reference, so I copied the memorandum from a letter I had written upon the subject. I am willing to produce the book to have the note verified, but cannot part with it.

[*Defendants' counsel objects to the evidence as to the words alleged to have been transmitted during that experiment as resting merely upon secondary evidence, unless the memorandum book itself is produced.*]

Cross-Int. 132. How many times and in what cases have you been examined as a witness as to the invention of the electric speaking telephone by Mr. Bell?

Ans. Twice. In the suit of Bell Telephone Company *v.* Dowd, and in Telephone Interferences A — L.

Cross-Int. 133. In either of those depositions did you testify to the exact words transmitted in the experiment of March 10, 1876, as you have now this morning done?

Ans. I have no recollection of so doing.

Cross-Int. 134. In that experiment of March 10, 1876, did you make the memorandum in your memorandum book at the time of your experiment?

Ans. I did; either the same evening, or the next morning.

Cross-Int. 135. Did you make memorandum of all the words that were spoken into the transmitter or only of such as were heard at the receiver?

Ans. Only such as I heard.

Cross-Int. 136. I suppose a good deal was spoken into the transmitter which you could not hear at the receiver, was there not?

Ans. I have no positive recollection as to how much I heard, or as to how much was said. I know, however, that the result of the experiment created great enthusiasm in my mind.

Cross-Int. 137. How long did the experiment last, and what time of day was it made?

Ans. I have a strong impression that it was made in the latter part of the afternoon, and that it lasted an hour or two.

Cross-Int. 138. Have you any knowledge or recollection as to how far the experiment was successful, and as to how much that was said into the transmitter was heard at the receiving instrument?

Ans. I have a positive recollection that the experiment was entirely successful. I do not remember what proportion of the words spoken at the transmitter were understood at the receiver.

Cross-Int. 139. When you say that the experiment was entirely successful, you evidently had in your mind some standard or ideal of entire success in such an experiment in the then state of the art. I want to know what that standard or ideal is. Did you consider it an entirely successful experiment because you were enabled to hear some words or sentences successfully?

Ans. I do not remember that I had any standard or ideal. I considered it successful inasmuch as the results were better than any I had previously heard.

Cross-Int. 140. It is a fact, is it not, that you did not hear at the receiver all that was spoken into the transmitter during that experiment?

Ans. I cannot say that it is a fact.

Cross-Int. 141. Have you any doubt that such is the fact?

Ans. I consider it highly probable that many words were spoken at the transmitter that were not understood at the receiver during that experiment?

Cross-Int. 142. In your answer to Cross-Int. 136 you say that the result of that experiment created great enthusiasm in your mind: why was your mind so greatly excited over that?

Ans. Because the results were so much of an improvement on what I had previously heard in the telephonic line.

Cross-Int. 143. Was that the first time that you had heard speech successfully transmitted over a telephonic line?

Ans. I had heard the previous summer the sound of Mr. Bell's voice through the telephone, but not nearly so well as on the March 10, 1876, experiment.

Cross-Int. 144. Prior to March 10, 1876, had you ever heard and understood any spoken words through a telephone, — I mean through any electric telephone?

Ans. I have no recollection of having heard more than the sound of Mr. Bell's voice prior to that experiment, but I cannot positively assert that such was the case.

Cross-Int. 145. In brief, you have no recollection of ever having heard a word through any electric telephone prior to March 10, 1876: is not that the fact?

Ans. The only recollection of experiments on speaking telephones prior to March 10, 1876, that I have, is that conveyed in my answers to Ints. 13 and 15, p. 203, in this case.

Cross-Int. 146. By referring to said thirteenth and fifteenth answers, I find that they do not definitely answer the question which I have just asked. I therefore repeat the question, and call for a definite answer to it.

Ans. I have no recollection of having understood anything that was said through the telephone prior to March 10, 1876.

Cross-Int. 147. In the liquid transmitter used March 10, 1876, in what sort of a vessel was the dilute sulphuric acid contained? Describe the vessel, the quantity of the liquid, the size of the platinum wire, and the depth to which it was immersed, and give the strength of the dilute sulphuric acid.

Ans. The liquid was contained, I think, in an ordinary glass tumbler. I have no positive recollection about the quantity of the liquid. I should think that possibly there was from one quarter to one half a pint. The platinum wire was considerably less than one eighth inch in diameter, how much less I cannot say. The instrument operated best when the platinum just touched the water. The strength of the acid was what Mr. Bell used for his electro-poion batteries, which was about one part of sulphuric acid to ten of water.

Cross-Int. 148. Was the top of the tumbler closed or open?

Ans. It was closed, I think, by a wooden cover, by which the membrane was supported, and connection was made with the water by a rod of metal, — platinum, I think, — passing through the cover into the water near one side of the vessel.

Cross-Int. 149. Can you make a drawing giving a vertical section of that apparatus sufficient to enable us to understand the construction of it?

Ans. I think I can. I am willing to try.

[*The sketch is put in evidence and marked "Exhibit Watson Sketch No.* 1," *and is as follows*: —]

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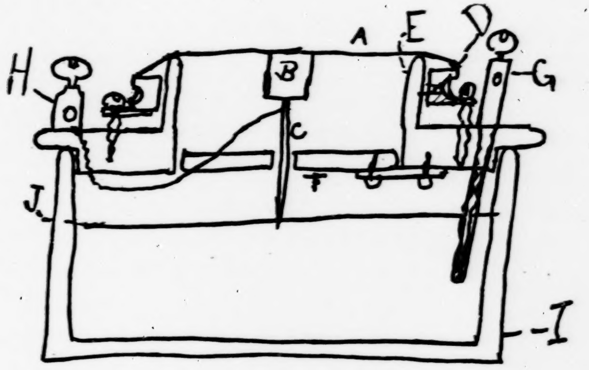
EXHIBIT WATSON SKETCH NO. 1, C. H. S., EXAMINER.



Cross-Int. 150. Please describe the different parts represented in the sketch, making use of the reference letters which you have marked on it.

Ans. A is the membrane fastened to the ring D, by which it is stretched over the ring E. The membrane carries a piece of cork B, in which is inserted a piece of platinum C; the platinum point is connected with the binding post H, and another binding post G runs through the wooden cover or ring E and dips into the water contained in the glass vessel I. I remember also that there was a plug passing through the cover E and into the water, and arranged so that more or less of it could be immersed in the water in order to regulate the depth of the platinum needle. F is a shield of wood fastened to the inside of the cover E to prevent the dilute sulphuric acid from spattering on the membrane. J represents the line of the top of the water.

Cross-Int. 151. Who made this instrument represented in Exhibit Watson Sketch No. 1?

Ans. I did.

Cross-Int. 152. Had you made one like it before you made this?

Ans. Never.

Cross-Int. 153. Had any one else ever made one like it, to your knowledge, before you made this?

Ans. Not to my knowledge.

Cross-Int. 154. When did you make this instrument?

Ans. I think I finished it a few days before the experiment of March 10, 1876.

Cross-Int. 155. Was it first tested on the tenth day of March, 1876; that is, was that the first test made with it?

Ans. My recollection is, that the first tests were made three or four days before March 10, but on that occasion it did not work so well, and some alterations were made.

Cross-Int. 156. You didn't succeed in getting any words through it so as to be understood before March 10, did you?

Ans. As I now remember the experiment, the instrument talked the first time we tried it, but the decomposition of the liquid caused it to be spattered against the membrane, rotting and spoiling it very quickly. The addition of the shield to prevent this splashing was, I think, the chief alteration that was made, and the only one that I remember.

Cross-Int. 157. In your answers to Cross-Int. 143 and Cross-Int. 146, you testified that you had no recollection of having heard and understood a word through an electric telephone prior to March 10, 1876: how do you reconcile that with your answer to Cross-Int. 155 and Cross-Int. 156?

Ans. In making the drawing the previous trials of that instrument were brought to my mind more distinctly than when I answered the questions referred to.

Cross-Int 158. Then am I to understand you now that two or three days prior to March 10, 1876, you heard and understood words transmitted through that same instrument before the shield was put on it?

Ans. That is my recollection, and that should have been excepted in my answers to Cross-Int. 143 to Cross-Int. 146.

Cross-Int. 159. Inasmuch as the shield took no part in the transmission of the current, I suppose you heard and understood the words just as clearly before the shield was put on as afterwards, did you not?

Ans. No; my recollection is that I heard very much more plainly March 10 then on the previous days.

Cross-Int. 160. How do you account for that?

Ans. Some other alteration must have been made beside the addition of the shield, but what that other alteration was I have forgotten.

Cross-Int. 161. Did you make a memorandum of any words spoken through that instrument prior to March 10, 1876, and if not, why not?

Ans. I have found no memorandum, and have no recollection of making any. If I didn't make any, it must have been because I didn't think the results were much of an improvement on what I had previously heard.

Cross-Int. 162. And it is still your recollection that the results of March 10 were so striking an improvement that they excited great enthusiasm in your mind, is it?

Ans. That is still my recollection.

Cross-Int. 163. Was Prof. Bell present while you were making that instrument or while you were making the alterations in it?

Ans. The instrument and the alterations were made by Mr.

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Bell's directions, but I do not think he was actually in the shop while I made them.

Cross-Int. 164. If I understand your testimony correctly, the instrument was made, completed and tested a few days before March 10, 1876, with results which were not entirely satisfactory; then the shield was added and certain changes were made which you cannot now remember in detail, after which the instrument was tested on March 10, 1876, with satisfactory results: is my understanding correct, and if not, wherein is it not?

Ans. That is my recollection of the matter.

Cross-Int. 165. Prof. Bell's first patent was dated March 7, 1876: did you have the specification of that patent in your hands to guide you in making that instrument?

Ans. I think not.

Cross-Int. 166. Did you get any assistance from that patent in making the modifications in that instrument which enabled it to produce satisfactory results after its first unsatisfactory trials?

Ans. I have no recollection whatever of so doing.

Cross-Int. 167. Do you regard the instrument as you had it March 10, 1876, as capable of successful practical use as a telephonic transmitter without any further change in it?

Ans. If there was no other telephone transmitter, that could in my opinion be used practically.

Cross-Int. 168. Please answer the same question as to the same instrument before the shield was applied to it and the changes made which you say were made at the time the shield was applied.

Ans. It would be impossible for me to say, as I do not remember the changes that were made other than the addition of the shield.

Cross-Int. 169. When the instrument was first tested, a few days prior to March 10, 1876, and found to give unsatisfactory results, what did Prof. Bell say about it?

Ans. I do not remember.

Cross-Int. 170. He directed you to go to work and make alterations in it, did he not?

Ans. He did.

Cross-Int. 171. How many tests did you make with it before you made the alterations?

Ans. I do not remember.

Cross-Int. 172. Did he discuss with you the character of the alterations he proposed to make and their possible advantage, before he directed you to apply them?

Ans. I have no recollection of his so doing.

Cross-Int. 173. Did the changes which were made considerably modify the construction of the instrument or not?

Ans. My recollection is the changes were slight, and did not change the form of the instrument at all.

Cross-Int. 174. Before those changes were tested on March 10, 1876, had you or Mr. Bell any knowledge of the striking results which they would produce, or was your knowledge of their effect gained only from the test on March 10?

Ans. I hadn't the slightest knowledge myself what the effect would be of the changes, and I don't think Mr. Bell had.

Cross-Int. 175. In the state of the art at that time I suppose the effect of those changes could not have been known except by actual experiment and test, could it?

Ans. That is my opinion.

Cross-Int. 176. Will you please refer to Prof. Bell's first patent, dated March 7, 1876, and state whether you find therein any directions or description whereby a skilled electrician could have constructed a practically operative liquid transmitter without any experiment on his own part, but simply by following the directions of the patent?

Ans. If a copy of this patent had been placed in my hands in 1876 or in the hands of any well-posted maker of electrical instruments, I think I or he could have made a liquid transmitter without any experiment by reading the whole specification and by special reference to the passage beginning "Undulations are caused in a continuous voltaic current," etc.

Cross-Int. 177. Had you never seen that specification prior to March 10, 1876?

Ans. I do not remember reading the specification till after March 10, 1876, and am quite sure I did'nt until a month or two later than that.

Cross-Int. 178. As early as the fall of 1875 you knew that Prof. Bell was preparing his specification, did you not?

Ans. I did.

Cross-Int. 179. And you had been assisting him in his various experiments for over a year prior to March 10, 1876, had you not?

Ans. No. I have no recollection of doing anything for him between July or August, 1875, and just before March, 1876.

Cross-Int. 180. Prior to March, 1876, you and Mr. Bell had very fully discussed his theories concerning electric undulations and the transmission of sound thereby, had you not?

Ans. I have no recollection of discussing theories with Mr. Bell prior to that time. I understood what he was working for, and made his apparatus to the best of my ability, exactly as he directed.

Cross-Int. 181. Do you mean to say that prior to March, 1876, you were ignorant of the theories and facts stated in Mr. Bell's first patent in the paragraph beginning with the words "undulations are caused," and ending with the words "diminishing the power of the battery?"

Ans. No, I don't think I was. I think I understand the theory of the telephone prett ywell for six or eight months prior to that date.

Cross-Int. 182. How did you come to understand it? Did you discover it yourself, or did Mr. Bell communicate it to you?

Ans. All I knew about it was what Mr. Bell told me.

Cross-Int. 183. You say you understood Mr. Bell's theories and particularly the theories and facts contained in said paragraph of his first patent for a long time prior to March, 1876, and it is certain that Mr. Bell himself must have known them for some time, inasmuch as his application for said patent was sworn to in January, 1876, and prepared some time before that: in view of these facts how do you account for it that the united intelligence of Mr. Bell and yourself didn't succeed in making that liquid transmitter work satisfactorily until March 10, 1876, and until after you had experimented with it, and changed it from the condition in which it was first produced and tested by Mr. Bell's directions?

Ans. My recollection of those changes is so indistinct that I can form no theory to account for the fact.

Cross-Int. 184. In this liquid transmitter exhibted in your sketch it is necessary to the successful working of it that it should stand on a horizontal foundation and be absolutely free from any movement or jar, is it not?

Ans. Not at all. The foundation should be nearly enough horizontal to prevent the liquid from running out of the glass, and I know no reason why it should be kept free from slight jar.

Cross-Int. 185. Would not the jarring of the liquid produce independent undulations of the current and interfere with the action of the transmitter?

Ans. I think strong and constant jarring would.

Cross-Int. 186. I understand you that you found the instrument worked best when the point of the platinum wire just touched the liquid. In that case the jarring of the liquid would be liable to make and break the current, would it not?

Ans. A strong jar probably would; I don't think a slight jar would.

[*Adjourned.*]

AUGUST 29, 1882.

[*The witness states*]: —

I produce the note book referred to in my answer to Int. 158.

Cross-Int. 187. Do you know what has become of that liquid transmitter that you experimented with on March 10, 1876?

Ans. No; I have not seen it since the experiment.

Cross-Ans. 188. What was the next transmitter that Mr. Bell produced after the experiment of March 10, 1876?

Ans. The next I remember were similar to the transmitters exhibited at the Centennial.

Cross-Int. 189. A liquid transmitter was exhibited at the Centennial, was it not?

Ans. Yes.

Cross-Int. 190. Was that liquid transmitter that was exhibited at the Centennial constructed exactly like the liquid transmitter that was tried March 10, 1876, or were further changes made in it before it was exhibited at the Centennial?

Ans. The construction is different, but the operation is the same.

Cross-Int. 191. That liquid transmitter exhibited at the Centennial is illustrated in the cut No. 29, p. 234 of Vol. I., complainants' case, and p. 34 of Vol. II., complainants' case, is it not?

Ans. It is.

Cross-Int. 192. Who made that transmitter?

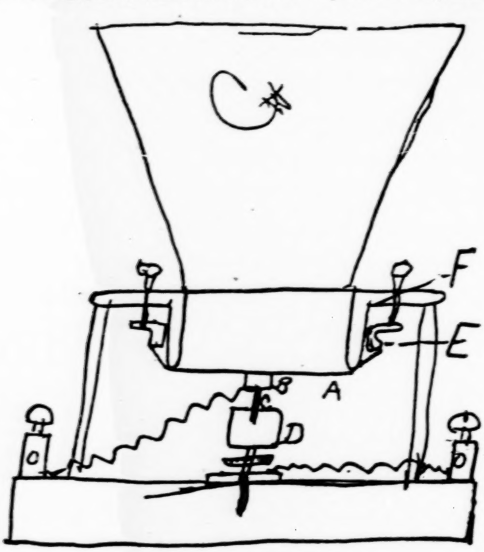
Ans. I did.

Cross-Int. 193. The cut printed in complainants' case does not exhibit the internal construction of the machine: will you please make a rough sketch showing in section its internal construction?

Ans. I have made such a sketch, and I here produce it.

[*The sketch is put in evidence and marked* "*Exhibit Watson Sketch No.* 2."]

EXHIBIT WATSON SKETCH NO. 2, C. H. S., EXAMINER.



A is the membrane tied to the ring E and stretched over the ring F. The membrane had attached to its centre a cork B carrying a piece of platinum wire C, which dipped into the liquid contained in the cup D. The depth of immersion of the platinum wire was regulated by raising or lowering the cup D by means of an adjusting screw. G was a tin mouthpiece, and the platinum point was connected with one binding post and the cup D to another.

Cross-Int. 194. Was the cup D covered or open at the top?

Ans. My recollection is that there was a cover, through which the platinum played.

Cross-Int. 195. Did this Centennial liquid transmitter produce any better or different results, as compared with that which was tested March 10, 1876?

Ans. I do not remember that it did.

Cross-Int. 196. You were present when Sir William Thomson tested the Bell telephone at the Centennial Exhibition, were you not?

Ans. No.

Cross Int. 197. What receiver was used at the Centennial Exhibition?

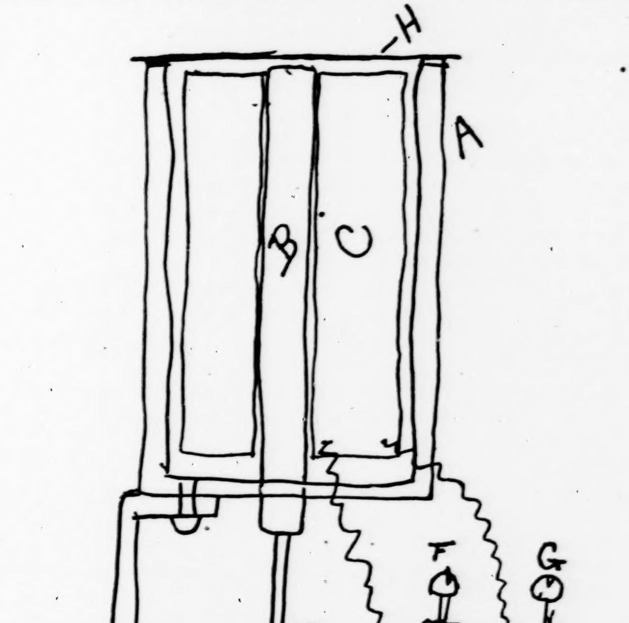
Ans. I have always heard that the iron box magnet receiver was most used, but I don't know whether the magnetos Nos. 26 and 27 were used or not.

Cross-Int. 198. Will you make a sectional drawing of the iron box magnet receiver, Exhibit No. 28, to show the construction of it?

Ans. I will, and I here produce it.

[*The sketch is put in evidence and marked "Exhibit Watson Sketch No. 3."*]

EXHIBIT WATSON SKETCH NO. 3, C. H. S., EXAMINER.



A is an iron tube closed at the bottom end by an iron plate. B is an iron rod or core, which slides through a hole in the bottom plate and is surrounded by a coil of insulated wire C. The core is adjusted by means of the screw D, and the whole is mounted on a wooden base E. The terminals of the coil are connected with binding posts F and G. On the open or upper end of the tube was laid a disk of thin iron H.

Cross-Int. 199. Was that disk of thin iron H fastened to the top of the tube in any way, or did it simply rest on the tube, touching at all the points around the tube?

Ans. The plate was laid on the top of the tube without fastening, I think.

Cross-Int. 200. That plate was the receiving diaphragm of the instrument, was it not?

Ans. Yes.

Cross-Int. 201. In your sketch No. 3 you have represented that plate as touching the tube at one side, but not the other: is that by design?

Ans. It is an accident, and I now correct it.

Cross-Int. 202. The instruments represented in Exhibits 26 and 27 were used both as transmitters and receivers, I suppose, were they not?

Ans. Yes.

Cross-Int. 203. As receivers how did their operation compare with Exhibit 28; which was the most satisfactory?

Ans. I think one who was not an expert at listening could have heard better with 28 than with 26 or 27; but I do not remember that I could hear one better than the other.

Cross-Int. 204. How did the operation of the instrument represented in Exhibit 28 compare with that which you used as a receiver in your experiment of March 10, 1876, and which was the most satisfactory?

Ans. The results were about the same, as I remember them.

Cross-Int. 205. You made all of Bell's Centennial instruments, did you not?

Ans. Yes.

Cross-Int. 206. It is in evidence here that a pair of instruments was presented by Mr. Bell to Sir William Thomson, cuts of which are shown at top of p. 241, Vol. I. of complainants' case: did you make those instruments which were presented to Sir William Thomson?

Ans. I did not make the iron box receiver there shown, but I think I did the other.

Cross-Int. 207. The iron box receiver is represented in the right-hand figure on p. 241, is it not?

Ans. Yes.

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Cross-Int. 208. Did you see that iron box receiver after it was made, and before Sir William took it away to Europe?

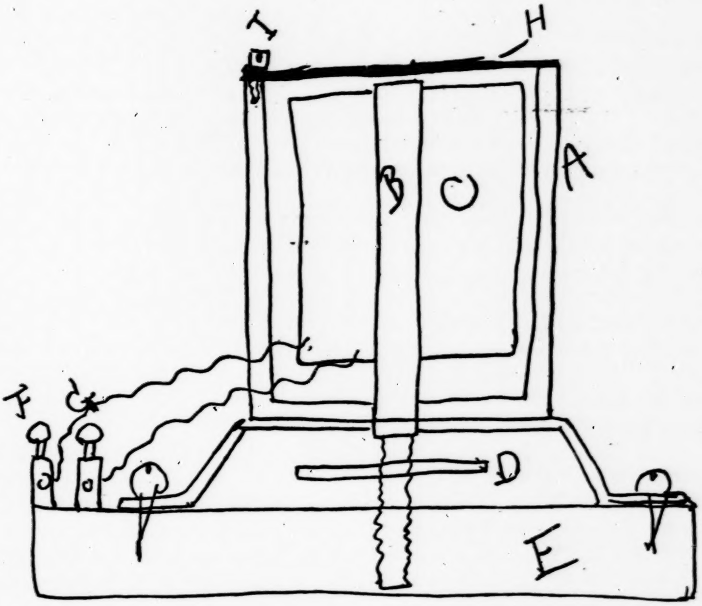
Ans. I did.

Cross-Int. 209. Will you make a sketch showing in section the construction of the iron box receiver?

Ans. I will, and here produce it.

[*The sketch is put in evidence and marked "Exhibit Watson Sketch No.* 4."]

EXHIBIT WATSON SKETCH NO. 4, C. H. S., EXAMINER.



I have lettered the sketch to correspond with sketch No. 3. It has in addition a screw I, by which the diaphragm is secured to the iron tube.

Cross-Int. 210. What was the function of that screw I, and why was it used?

Ans. To prevent the diaphragm from falling off and being lost when the instrument was not in use.

Cross-Int. 211. In the cut at the top of p. 241, complainants' case, the diaphragm is represented as in contact with the top of the tube only at the side where the screw is: how was that?

Ans. The instrument was not intended to be so.

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Cross-Int. 212. Was that instrument intended as a substantial reproduction of the iron box receiver Exhibit 28?

Ans. It was.

Cross-Int. 213. Did you test it yourself to see whether it worked as well as the instrument shown in Exhibit 28?

Ans. I tested it, but do not remember whether it was better or worse than 28.

Cross-Int. 214. How do you account for it that the diaphragm in the cut is represented as in contact with the tube only at one side, when the instrument itself was constructed to have the diaphragm in contact with the tube all around?

Ans. It must have been bent in transportation or by some accident.

Cross-Int. 215. Were these Centennial instruments the first instruments made by or for Prof. Bell containing a metallic diaphragm?

Ans. There was another instrument with a metallic diaphragm made just before the Centennial Exhibition, but, aside from this, the Centennial instruments were the first that I know of that had metallic diaphragms.

Cross-Int. 216. Was that other instrument with a metallic diaphragm which was made just before the Centennial Exhibition a transmitter or a receiver?

Ans. My recollection is that it was used both ways.

Cross-Int. 217. It was then the first transmitter that contained a metallic diaphragm, was it not?

Ans. The first that I remember.

Cross-Int. 218. Is it illustrated in any of the cuts put in in complainants' case?

Ans. It is referred to in Ints. and Ans. 47 and 48, p. 210, complainants' case, Vol. I., and in Mr. Bell's Ints. and Ans. 167–169, pp. 169 and 170 of the same volume, and is illustrated in Exhibit 33, p. 64 of Vol. II.

Cross-Int. 219. In the cut p. 64, Vol. II., I see nothing more than a flat disk supported on three pins: does that represent the entire instrument?

Ans. No.

Cross-Int. 220. Please make a sketch representing the entire instrument in section, so as to show its construction.

Ans. I have made a sketch of the instrument as I remember it, and here produce it.

A A represents a double pole electro-magnet, B a diaphragm of thin sheet iron riveted to the brass ring *C*, and mounted on legs D D. The terminals of the magnet were connected, I think, to binding posts. There was some means of adjustment to regulate the distance between the end of the electro-magnet and the diaphragm. What that adjustment was I have forgotten.

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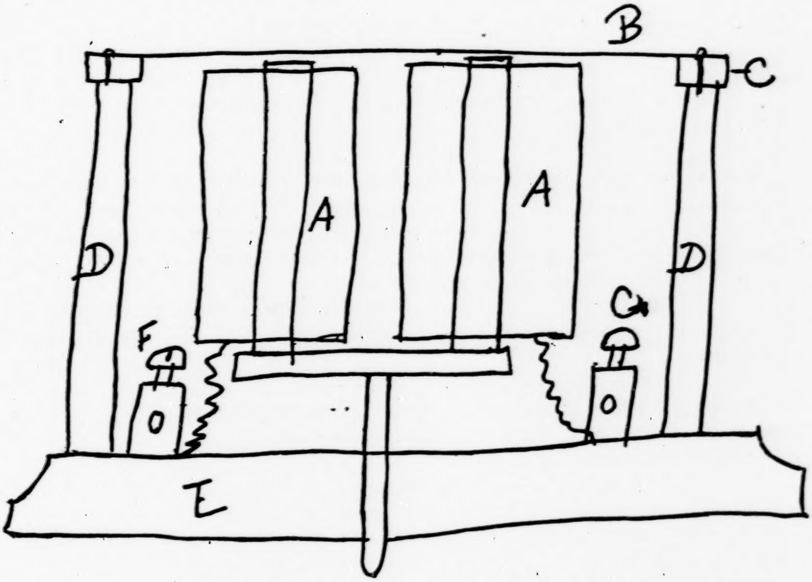
[*The sketch is put in evidence and marked "Exhibit Watson Sketch No. 5."*]

EXHIBIT WATSON SKETCH NO. 5, C. H. S., EXAMINER.



Cross-Int. 221. Referring to the memorandum book which you have produced here this morning: has that been in your possession ever since March 10, 1876?

Ans. It has.

Cross-Int. 222. The entry in it is made in pencil, is it not, — I mean the entry of March 10, 1876?

Ans. It is. Almost all the entries in the book are.

Cross-Int. 223. Have you always retained a distinct recollection from that time to this of making that memorandum?

Ans. It is impossible for me to say. I have such a recollection now, and probably always would have had if my attention had been called to it particularly.

Cross-Int. 224. When was the first time that you ever heard and understood words transmitted over a telephonic line by means of a magneto transmitter?

Ans. My recollection now is that I heard and understood words from a magneto transmitter shortly after March 10, 1876.

Cross-Int. 225. Is that magneto transmitter illustrated here in any of the cuts in evidence in this case?

Ans. I do not remember precisely what it was, but it was similar to Exhibits 26 or 27.

Cross-Int. 226. To the best of your recollection, how long after March 10, 1876, was it that you first heard spoken words successfully transmitted over that magneto instrument?

Ans. To the best of my recollection during March or April, 1876.

Cross-Int. 227. That instrument had a membrane diaphragm, I suppose, had it not?

Ans. I think it had.

Cross-Int. 228. Describe the armature, its size, shape, material and manner of attachment to the diaphragm in that instrument.

Ans. All that I can remember about it is that it consisted of a piece of clock spring shellacked to the membrane. I do not remember the dimensions at all.

Cross-Int. 229. Was that the first magneto instrument which had a metal armature attached to and supported only by the diaphragm?

Ans. It was the first I remember.

Cross-Int. 230. Who made that instrument and when?

Ans. I think I did, just before it was tested.

Cross-Int. 231. It was made after March 10, 1876, was it not?

Ans. According to my recollection.

Cross-Int. 232. Did you ever see the instruments which Mr. Bell made or had made in 1875, which are represented in Fig. 7 of his first patent?

Ans. I consider Fig. 7 a diagram of the instruments I made for him in June and July, 1875.

[*Defendants' counsel puts in evidence in this case the extracts from Prof. Bell's London lecture of Oct.* 31, 1877, *before the Society of Telegraphic Engineers, printed on pp.* 692, 693 *and* 694 *of Vol.* II. *of the Dowd case, the same to be marked in this case as "Exhibit Extracts from Bell's London Lecture"; and it is admitted by complainants' counsel that said extracts are correct copies from Prof. Alexander Graham Bell's said lecture.*]

Cross-Int. 233. In that part of Prof. Bell's London lecture which I have just put in evidence he refers to an apparatus which he tried, and which he illustrates by Figs. 22 and 23, and concerning which he then proceeds to make the following statement, to wit: —

"The results, however, were unsatisfactory and discouraging. My friend, Mr. Thomas A. Watson, who assisted me, in his first experiment declared that he heard a faint sound proceed from the telephone at his end of the circuit, but I was unable to verify his assertion. After many experiments, attended by the same only partially successful results, I determined to reduce the size and weight of the spring as much as possible. For this purpose I glued a piece of clock spring, about the size and shape of my thumb nail, firmly to the centre of the diaphragm, and had a similar instrument at the other end; we were then enabled to obtain distinctly audible effects."

I suppose that the instrument here referred to by Mr. Bell, after he had glued the piece of clock spring about the size and shape of his thumb nail firmly to the centre of the diaphragm, and with which he was then able to obtain distinctly audible effects, was the same instrument to which you referred this morning as having been made in March or April, 1876, and after March 10, and through which you for the first time heard and understood words transmitted through a magneto transmitter, was it not?

Ans. I don't actually know, but am inclined to think so.

Cross-Int. 234. In the experiments connected with Mr. Bell's invention, when and in what machine was provision first made for adjusting the distance between the pole of the electro-magnet and the surface of the armature which was to vibrate in front of the pole of the electro-magnet?

Ans. In the first machine I made for him, in June, 1875.

Cross-Int. 235. The machines which you made for him in June, 1875, are represented at Figs. 19 and 22, pp. 3 and 4 of Vol. II. of complainants' case, are they not?

Ans. Yes, with the exception noted in my answer to Int. 20. p. 205, Vol. I., of complainants' case.

Cross-Int. 236. Which of those two machines was first made? I mean the originals.

Ans. That represented by Exhibit 19.

Cross-Int. 237. Both of the original machines, duplicates of which are shown in Exhibits 19 and 22, had the same adjustment, had they not?

Ans. That is my recollection. In both the originals the adjustment was made by sliding the cross bar that supported the magnet up and down in the slots in the sides, as in Exhibit 19, and binding it in place, when it was properly adjusted, by the screws and clamps.

Cross-Int. 238. In these Exhibits 19 and 22 the armatures are composed of pieces of very thin metal: was that so in the instruments constructed in the summer of 1875, or were the armatures thicker and heavier in those instruments?

Ans. I do not now remember; I think they were thicker.

Cross-Int. 239. The apparatus represented in Fig. 7 of Bell's first patent was not made till some time after the original instruments of which Exhibits 19 and 22 purport to be duplicates, was it?

Ans. Fig. 7 I consider merely as a diagram of the original instruments made in June and July, 1875.

Cross-Int. 240. Do you mean that prior to March 7, 1876, there was no apparatus made of which Fig. 7 would be an exact representation?

Ans. I know of none.

Cross-Int. 241. If such an apparatus was made, then I suppose you do not know why all means of adjusting the armatures relatively to the poles of the magnet were omitted from it, do you?

Ans. I know of no reason why it should have been.

Cross-Int. 2 2. Do you know whether the original instruments made in June, 1875, are now in existence?

Ans. Parts of them are, as stated in my answer to Int. 18, p. 204, Vol. I.

Cross-Int. 243. When were the duplicates Exhibits 19 and 22 made?

Ans. In the summer of 1879, I think.

Cross-Int. 244. Are any of the original instruments represented in the cuts on pp. 232–234, complainants' case, Vol. I., still in existence; if so, which ones?

Ans. I believe they all are.

[*Defendants' counsel requests complainants' counsel to put in evidence all the existing instruments and parts of instruments made by and for Mr. Bell prior to the close of the Centennial Exhibition in November*, 1876.]

Cross-Int. 245. From your experience as a manufacturer of speaking telephones, state whether or not a very delicate adjustment of the distance between the armature and the pole of the electro-magnet is required for the effective transmission of speech.

Ans. What I understand as a delicate adjustment is not required.

Cross-Int. 246. What do you understand as a delicate adjustment?

Ans. It depends entirely upon the nature of the instrument. I should consider that a telephone requiring an adjustment as close as one or two one-hundredths of an inch would be one that required a delicate adjustment.

Cross-Int. 247. Did Mr. Bell get his harmonic telegraph to work satisfactorily?

Ans. I do not know; I think not.

Cross-Int. 248. In your experiments relating to harmonic telegraphy in 1875, did you succeed in getting the different pitch of tones clearly indicated through Mr. Bell's instruments?

Ans. It is my recollection that I did.

Cross-Int. 249. Is it your recollection that you got the pitch of vocal tones clearly indicated, or only the pitch of instrumental tones?

Ans. My recollection is that I heard the pitch of Mr. Bell's voice in the June 2, 1875, experiment.

Cross-Int. 250. In testing those instruments made in the summer of 1875 and experimenting with them in that year, — I mean the original instruments, of which Exhibits 19 and 22 purport to be duplicates, — did you make pretty frequent use of the adjusting devices for adjusting the armature to the poles?

Ans. I do not remember how frequently they had to be adjusted.

Cross-Int. 251. In your thirty-fifth answer, p. 208, complainants' evidence, Vol. I., you state that the filing of the application for an American patent by Mr. Bell was delayed during the fall and winter of 1875, in order that he might apply for a patent in England before he did in the United States: do you know when Mr. Bell did apply for his English patent; if so, when was it?

Ans. I knew, but I have now forgotten.

[*Defendants' counsel calls attention to the fact that complainants have put in evidence and printed in Vol.* II., *pp.* 46–63, *the provisional specification of Mr. Bell's English patent, dated Dec.* 9, 1876. *Defendants' counsel objects to the introduction of the provisional specification without the rest of the English patent, on the ground that it is partial and incomplete, and requests that the entire patent be put in evidence.*]

Cross-Int. 252. In the instruments represented by Exhibits Nos. 19 and 22, the cuts on pp. 3 and 4, complainants' evidence, Vol. II., are intended to show the actual position of the instruments when in use, are they not?

Ans. No.

Cross-Int. 253. Will you please explain then the actual position of the instruments when in use, and how they were used in your experiments?

Ans. No particular position is necessary. My recollection is that they were held in the hand when first used in the most convenient position for directing the voice against the membrane on the side opposite to the magnet.

Cross-Int. 254. The mouth orifice then extends through the baseboard of the instrument as represented in those two cuts?

Ans. Yes.

Cross-Int. 255. And in testing the instruments in your experiments, you spoke or made noises through the orifice in the base-board, did you not?

Ans. Yes.

Cross-Int. 256. Did you preserve any actual measurements of any of the instruments made prior to the close of the Centennial Exhibition, or actual measurements of any of the parts of said instruments, or the relative positions of the different parts? If so, designate all the instruments of which measurements were preserved, and state what measurements were preserved.

Ans. I have preserved no measurements, but the originals of Exhibits 26, 27, 28 and 29, on pp. 232–234, and the parts noted in my eighteenth answer have been preserved.

Cross-Int. 257. Were any such measurements made and preserved by anybody, to your knowledge?

Ans. I do not now remember that there were, understanding the question to refer to written measurements, and not to instruments and parts of instruments that were preserved.

Cross-Int. 258. Then of all the instruments that were made prior to the Centennial instruments, there now are extant only the parts specified in your eighteenth answer, and, so far as you know, there are not extant any records of measurements of such parts as have disappeared, nor of the relative arrangement of the parts with relation to each other and their distances from each other: is that a fact?

Ans. The only parts I know of still extant are the parts mentioned in my eighteenth answer, and the tripod and diaphragm shown as Exhibit 33, p. 64, complainants' evidence, Vol. II. I do not now know of any records of such measurements.

Cross-Int. 259. Then in getting up the reproduced instruments, which were tested in 1879, and subsequently, and which instruments and tests have been put in evidence here, you had to supply the missing parts simply from memory and judgment, had you not?

Ans. I believe so.

Cross-Int. 260. You cannot swear then that the reproduced instruments referred to were, in fact, exact copies of the originals in all respects, but only that they were the best that you could do from memory, aided by the presence of the few parts which remained extant. Is that the fact?

Ans. That is the fact.

Cross-Int. 261. Were the reproduced instruments which are here in evidence made under your direction and in your presence?

Ans. They were made under my general directions, but not in my presence

Cross-Int. 262. In the summer of 1879, when these reproduced instruments were made under your direction, you had already had a great deal of experience in the manufacture and operation of electric speaking telephones, had you not?

Ans. Yes.

[*Adjourned.*]

AUGUST 30.

[*The witness states*: —]

Since I answered Cross-Int. 261 I have found that I had already testified on this point. When I made the answer I was under that impression, and so stated in conversation, but was unable to find it. I had already testified in my sixty-fourth answer, p. 213, Vol. I.; as I then testified within a few weeks of the making of the instruments, the answer is undoubtedly correct.

[*Defendants' counsel now ascertains from complainants' counsel that the several articles referred to in the extract from Prof. Cross's depo-*

LEPHONE COMPANY,-3

sition in the Dowd suit, which has been put into this case and printed on pp. 223–228, *have not been offered in evidence and are not here present. Said articles are referred to in said extract as Exhibits Nos.* 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46 *and* 47. *The witness, Mr. Watson, in adopting as his own answers the third, fourth, fifth, sixth, seventh, eighth, ninth and tenth answers of Prof. Cross, above referred to, has testified concerning all those exhibits from No.* 36 *to No.* 47 *inclusive; and as the exhibits are not in evidence, and not here present, it is impossible for defendants' counsel to cross examine with reference to them and the experiments and tests alleged to have been made with them. Defendants' counsel therefore objects to the reading of the extracts from Prof. Cross's deposition, and objects to all testimony of Mr. Watson relating to said exhibits, Nos.* 36 *to* 47, *or any of them, by reason of the facts here stated, and because defendants' counsel has never had any opportunity to see any of said exhibits, and cannot, in their absence, properly conduct a cross examination with reference to them.*

Complainants' counsel states that the instruments referred to are on file and in the custody of another tribunal, and that he hopes to be able to procure them for exhibition and use in this case.

Defendants' counsel states that that will not obviate the objection just made by defendants' counsel to the testimony of Mr. Watson and the reading of said extract, unless defendants' counsel shall have an opportunity after the said instruments or articles are put in evidence to cross examine the witness upon them.

Complainants' counsel says that he does not agree with defendants' counsel in this respect, but the Court will judge of the weight of the objection.]

Direct Examination resumed.

Int. 263. In your first answer, given July 14, 1879, you stated that you were then general inspector of the National Bell Telephone Company: how long did you continue thereafter to hold that position or any similar one for that company or its successors?

Ans. Until the spring of 1881.

Int. 264. Where did you go then?

Ans. To Europe.

Int. 265. How long did you stay abroad?

Ans. One year.

Int. 266. Are you about to leave this part of the country now; and, if so, how soon and for how long?

Ans. I am; the last of this week; for probably a year.

Int. 267. I call your attention to the ordinary rubber hand telephone of the ordinary butter-stamp form, referred to in your deposition, p. 290, Vol. I.

I understand from your deposition that that form, first with wooden and afterwards with hard rubber handles, was introduced into commercial use in 1877, and is the form of magneto telephone in ordinary use in this country: is that the fact?

Ans. It is.

Int. 268. While you superintended or inspected the construction of those instruments, what was the rule and practice with regard to the distance between the core and diaphragm?

Ans. To make it rather less than one thirty-second of an inch.

Int. 269. Was that distance fixed in the original construction of such instrument at the shop, or were the instruments provided with an adjusting screw by which the operator could vary it?

Ans. It was fixed in the shop, and could be varied only by taking the instrument entirely to pieces. No adjusting screw whatever was or has been supplied.

Int. 270. In the first form of the hand telephone with the wooden handle, shown at the top of p. 289 of your deposition, I observe that the diaphragm is held in a definite position in the wooden handle by being placed on the end of the body of the handle, and the cap piece is screwed down on to it so that the distance between the diaphragm and the core is determined by the position of the magnet in the handle: please state how in that particular instrument the core and magnet were held in position in the handle.

Ans. The hole was made rather smaller than the diameter of the magnet, and the magnet driven tightly into it.

Int. 271. If you found any practical difficulty in the use of that form of instrument with reference to the maintenance of the proper distance between the core and diaphragm, please state what it was.

Ans. I found such difficulty. The magnet would often become loose in the handle, and the slight jars to which it was subjected in ordinary use caused the end of the core to come in contact with the diaphragm.

Int. 272. What steps did you take, or what change in construction did you adopt, if any, to remedy that difficulty?

Ans. I made the hole in the handle exactly the right depth, tapped a hole in the end of the magnet farthest from the diaphragm, and fastened it by putting a screw through the bottom of the handle into it.

Int. 273. In the rubber hand telephones of the butter-stamp form in ordinary use, how is the magnet and core attached to the handle?

Ans. In the same manner as in the previous answer.

Int. 274. Will you point out that screw in a hand telephone, and state whether it is shown in the drawing of p. 290?

Ans. It is shown in the drawing; and it is the screw between the two binding posts, with a washer under its head.

Int. 275. In placing the magnet in position in each instrument as manufactured, is its position determined in each instrument by experiment, or is its position determined by measuring or gauging, or how?

Ans. Its position is the same in every telephone, and is determined by a gauge, consisting of a piece of steel filed to rest on the top of the body of the handle, against which the diaphragm rests, and to project inside the handle the proper distance, which I have stated to be rather less than one thirty second of an inch. The pole is then pushed up against it, and the magnet is fastened in that position. Then the gauge is removed and the diaphragm inserted.

Int. 276. Your object being to so fasten the magnet that the end of the core should come to a definite position with reference to the front or flaring end of the handle, how do you make up for accidental variations in the length of the magnet itself, or in the bore of the handle?

Ans. By inserting thin metal or paper washers between the end of the magnet and the bottom of the bore of the handle.

Int. 277. Has it been the practice at any time in manufacturing these articles for commercial use, after the magnet was placed in position in the handle to fill up the interstices between the magnet and the handle with wax or paraffine poured in, melted and allowed to harden?

Ans. Such was the practice up to about a year ago; and I think is still, unless some other substance is used.

Cross Examination resumed.

Cross-Int. 278. Are you now engaged in any business, if so, what?

Ans. I am in no business just now.

Cross-Int. 279. Was your recent visit to Europe on telephone business?

Ans. It was partly for pleasure and rest, and partly to sell my foreign patents.

Cross-Int. 280. Were your foreign patents for telephones?

Ans. No.

Cross-Int. 281. What were they for?

Ans. For switch boards and call bells for telephone systems.

Cross-Int. 282. Have you American patents on those inventions?

Ans. On some of them.

Cross-Int 283. Have you any American patents on telephones?

Ans. Yes.

Cross-Int. 284. How many American patents have you taken out or applied for, including all subjects of invention?

Ans. I haven't exactly in mind. I think rather more than sixty.

Cross-Int 285. Do the complainants own any of those inventions on which you have taken patents or applied for patents?

Ans. They own all of them.

Cross-Int. 286. Do you get any royalty or other emolument for the use of your inventions by the complainants?

Ans. No.

Cross-Int. 287. Are you a stockholder in the complainant corporations or either of them?

Ans. I am a stockholder in the American Bell Telephone Company.

Cross-Int. 288. You have stated that in the hand telephones the distance between the diaphragm and the pole of the electro-magnet is fixed and not adjustable, and is set at something less than one thirty-second of an inch: why is it set at that distance?

Ans. That distance was determined somewhat arbitrarily by myself, that being the distance which, in my judgment, would be sufficient to allow for the variations consequent on the accidents attending its ordinary use and the different degrees of expansion and contraction in the rubber handle and steel magnet.

Cross-Int. 289. Could the diaphragm and the pole of the electro-magnet be placed any nearer together in practice without the diaphragm being liable to touch the pole when vibrating in the ordinary use of the instrument?

Ans. The fact that there has been little or no trouble arising from the contact of the core and diaphragm in the many thousands of instruments made under my charge leads me to suppose that the distance could be less than it is now, but I should not recommend that it be done.

Cross-Int. 290. When did you determine upon that distance?

Ans. When the manufacture of telephones for practical business use was first begun in the spring of 1877.

Cross-Int. 291. I suppose you made some experiments to assist you in determining upon what was the best distance, did you not?

Ans. I have no recollection of making such experiments.

Cross-Int. 292. The complainants have made and sold no telephones having a membrane diaphragm, have they?

Ans. None that I know of.

Cross-Int. 293. If they used a membrane diaphragm in a hand telephone instead of a metal diaphragm, in machines which they put out for the public to use, would it be necessary to have some means provided for adjusting the distance between the armature and the poles of the electro-magnet?

Ans. I do not think it would be entirely necessary; still it might be better to do so.

Cross-Int. 294. Do you think the instruments would be successful and satisfactory to the public without some means of adjustment in such case.

Ans. If there were no better telephones I think they would.

Cross-Int. 295. In your answer to Int. 35, p. 208, you say that in the fall of 1875, or that winter, you knew that Mr. Bell was making arrangements with some one to take out the English patent for him: what kind of an arrangement do you refer to; arrangements with an attorney to do the work or arrangements with capitalists to furnish the means?

Ans. The latter.

Cross-Int. 296. You have stated that you have taken out or applied for some sixty American patents: what proportion of that number of your inventions related to telephones?

Ans. They all do, either to telephones or to auxiliary telephonic apparatus. About ten of them relate to telephones.

THOMAS A. WATSON.

Attest: CHAS. H. SWAN, *Examiner.*

AMERICAN BELL TELEPHO

BOSTON, Nov. 13, 1882.

Present: JAMES J. STORROW, Esq., *of Counsel for Complainants;*
L. HILL, Esq., *of Counsel for Defendants.*

DEPOSITION OF CLARENCE J. BLAKE.

Direct Examination by J. J. STORROW, Esq., *of Counsel for Complainants.*

Int. 1. Please state your name, age, residence, and occupation.

Ans. Clarence John Blake; thirty-nine years; Boston; physician.

Int. 2. Did you give a deposition in 1879 in the case of the American Bell Telephone Company *v.* Peter A. Dowd?

Ans. I did.

Int. 3. Will you look at that deposition, of which I show you a printed copy, and state whether the facts there stated are correctly stated; and if so, read it to the magistrate, that he may take it down as a part of your answer?

Ans. They are correctly stated. It is as follows: —

DEPOSITION OF C. J. BLAKE.

Direct Examination by J. J. STORROW, Esq., *of Counsel for Complainants.*

BOSTON, July 25, 1879.

Int. 1. Please state your name, age, residence, and occupation.

Ans. Clarence J. Blake; age, thirty-six; Boston, Mass.; physician; lecturer on otology in Harvard University, aural surgeon in Massachusetts Eye and Ear Infirmary.

Int. 2. Please look at the drawing Exhibit 30* [*Exhibit No.* 18 *in People's Telephone Co. case*],† Dr. C. J. Blake Drawings. State when, where and by whom they were made, and in whose custody they remained after they were made.

Ans. October, 1874; at my office, in Hotel Berkeley, Boston; by Alexander Graham Bell, and remained in my possession.

Int. 3. Did Mr. Bell, at that time, describe to you any apparatus for the transmission of sound by electricity? If so, please repeat the description he gave you of the apparatus and the mode in which it was to operate, and the character of the sounds which he intended to transmit by it.

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* A photo-lithographic *fac-simile* of this exhibit is on p. 336, *infra.*

† In the deposition here incorporated into Dr. Blake's answer to Int. 3, the exhibits are numbered as in the Dowd case. The numbers in brackets are the numbers applied in the present suit of the American Bell Telephone Company *v.* The People's Telephone Company.

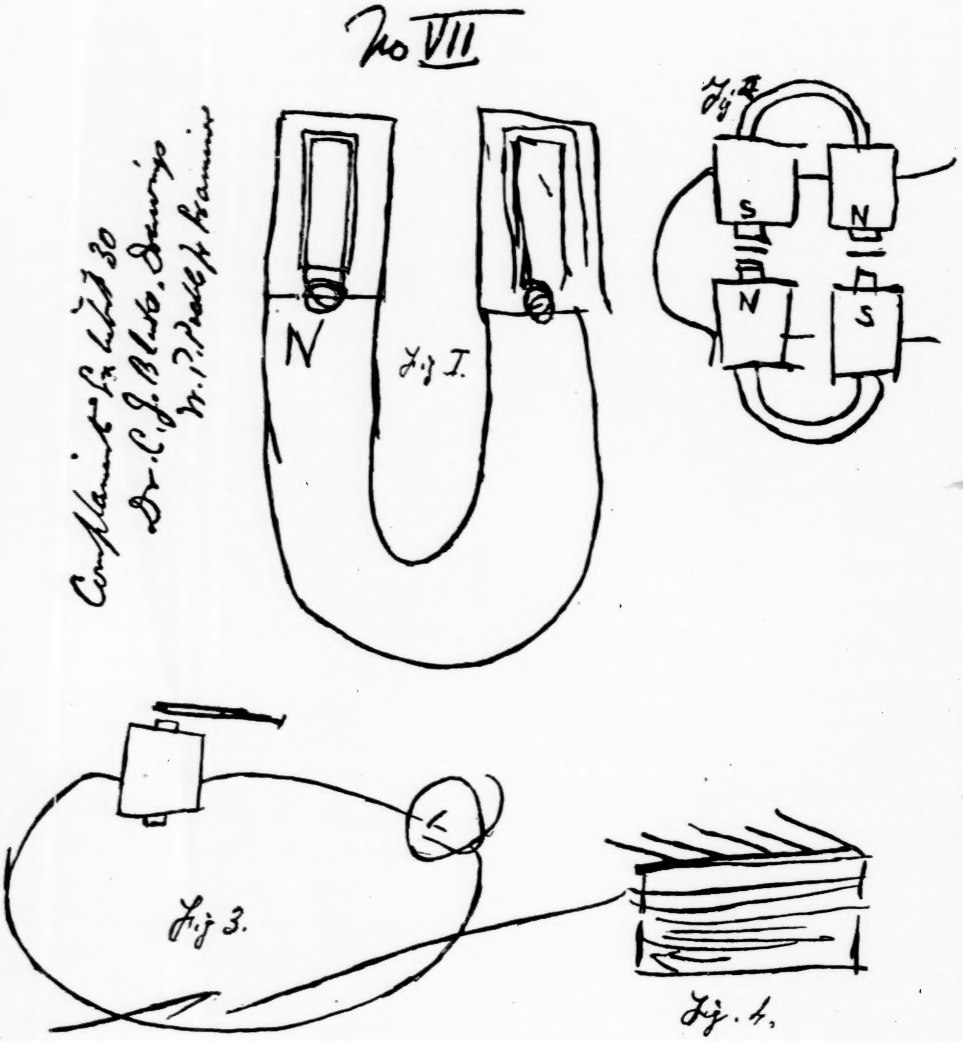
COMPLAINANTS' EXHIBIT NO. 30.

[No. 18 in People's Telephone Co. Case.]

DR. C. J. BLAKE'S DRAWINGS.

[Complainants' Record, pp. 123, 335, etc.]

C. H. S., *Examiner.*


No VII
Complainants Exhibit 30
Dr. C. J. Blake's Drawings
W. P. Peabody Examiner
N
Fig. I.
Fig. 2
S
N
N
S
Fig. 3.
Fig. 4.

Ans. He did describe an apparatus consisting of a metal reed set in vibration in front of a magnet as part of an organ pipe. Also an apparatus consisting of a metal reed set in vibration in front of a magnet and coil, and also an apparatus consisting of a metal reed set in vibration between two magnets and coils, and also an apparatus consisting of a series of metal reeds which might be set in vibration in response to a musical instrument or the human voice. The idea of this latter apparatus was that the metal reeds of different lengths would respond to the different tones of a musical instrument or of the human voice.

Int. 4. Did he describe to you any electrical apparatus in which a membrane was to be used? If so, please tell me what that apparatus was.

Ans. Yes; an apparatus in which one metal reed was substituted for the several metal reeds of the harp last mentioned, this one reed being actuated by a membrane to which it was to be attached, which membrane was to be set in vibration by the tone of the musical instrument or by the human voice.

Int. 5. Did you have any discussion with him as to the character of the membrane, or mode of arrangement of the membrane and armature? And if so, state what was said on that subject at that interview by both of you.

Ans. Yes; the idea of Prof. Bell as communicated to me was this: That if the simple pendulous vibration of a metal reed could be communicated to a second reed electrically connected with the first, more complicated vibrations communicated to the metal reed from a musical instrument or the human voice, through the medium of the air, could also be electrically transmitted. To accomplish this purpose, it was, according to his idea, advisable to attach the metal reed to a membrane, which would reproduce the aerial vibrations produced by a musical instrument or the human voice, substituting a metal reed in fact for the stylus of the improved Morey phonautograph, and of the *membrana tympani* phonautograph with which he had been experimenting. I then suggested, as an experiment, since his principal object was the electrical transmission of articulate speech, that the metal reed should be brought in contact with the human *membrana tympani*, suitably prepared and mounted for the purpose.

Int. 6. What did you conceive to be the advantage of using a membrane consisting of the human *membrana tympani* instead of parchment or sheepskin, or other kind of membrane, in such an apparatus as he described for the electrical transmission of articulate speech?

Ans. The fact that the human *membrana tympani* responds to a wider range of musical tones than any artifically prepared membrane, and that it has been specially adapted by nature to respond in vibration to the human voice.

Int. 7. Did you make a transmitting and receiving instrument of a speaking telephone, using the membrane of a human ear?

Ans. At that time the experiment was not tried. We were unwilling to dismount the *membrana tympani*, which we were then using as a phonautograph. But I have since constructed a human *membrana tympani* telephone, with which articulate speech was electrically communicated in March, 1878.

Int. 8. Please look at the instruments now shown you, marked "Complainants' Exhibits 15 and 16, Membrane Telephone No. 2" [*Exhibits Nos.* 36 *and* 37 *in People's Telephone Co. case*], "Exhibits 17 and 18, Baby Membrane Telephones [*Exhibits Nos.* 38 *and* 39 *in People's Telephone Co. case*], 19 and 20, Lovers' Electric Telephones" [*Exhibits Nos.* 40 *and* 41 *in People's Telephone Co. case*]. State whether you have witnessed the transmission of articulate speech by them or any of them; if so, state when and where, and with what results.

Ans. Yes. Afternoon of June 2, 1879. Office of Mr. Storrow, 40 State Street, Boston. I heard distinctly a sentence spoken by Mr. Watson, using Exhibit 15 [*Exhibit* 36 *in People's Telephone Co. case*], with Exhibit 16 [*Exhibit* 37 *in People's Telephone Co. case*], as a receiver; also Exhibit 17 [*Exhibit* 38 *in People's Telephone Co. case*], using Exhibit 18 [*Exhibit* 39 *in People's Telephone Co. case*] as a receiver; also Exhibit 19 [*Exhibit* 40 *in People's Telephone Co. case*], using Exhibit 20 [*Exhibit* 41 *in People's Telephone Co. case*] as a receiver.

Int. 9. To save time I will ask you whether the general arrangement of the two stations and the circuit was the same as that described in Prof. Cross's third answer, p. 383? [p. 223 *supra.*]

Ans. It was.

Int. 10. Did you use any of these instruments to transmit from the station where you were to the other station; if so, which?

Ans. Yes. Exhibits 19 and 20 [*Exhibits* 40 *and* 41 *in People's Telephone Co. case*] transmitted both ways.

Int. 11. Why did you not attempt to transmit both ways by the others?

Ans. Because the cone of the receiving instrument was not adapted to transmission.

Int. 12. State whether or not the instruments at that trial transmitted articulate speech well enough to be of any practical utility.

Ans. They did.

Int. 13. State whether or not at that trial you found that the instruments were affected by continuous use for any length of time, and if so, whether they were affected favorably or unfavorably, and what particular change took place in them in consequence of continued use of the transmitter.

Ans. They were unfavorably affected in consequence of the relaxation of the membrane, due to the absorption of moisture from the breath in speaking into the instrument.

Int. 14. Please look at the complainants' Exhibits 31 and 34, Bell Telephone of 1875 [*Exhibits Nos.* 19 *and* 22 *in People's Telephone Co. case*], and state whether you took part in a trial of them on the 7th of July, 1879, when they were mounted with the sheepskin membranes, Exhibits 32 and 35 [*Exhibits Nos.* 20 *and* 23 *in People's Telephone Co. case*], and the heavy armatures 33 and 47 [*Exhibits Nos.* 21 *and* 35 *in People's Telephone Co. case*]; if so, describe those trials, and state where they took place.

Ans. I did. First, in the workshop of Charles Williams, Jr., at 109 Court Street, Boston, the receiving instrument being in the workshop, and the experiments being conducted while the usual work of the shop was going on. I am not certain of having heard any sound through the instrument. Second, with the same instruments, immediately after the first trial, the experiment was repeated in the office of Mr. Storrow, and articulate speech was distinctly heard with the receiving instrument.

[*Cross examination waived.*]

CLARENCE J. BLAKE.

Attest: W. P. PREBLE, Jr., *Examiner.*

[*The exhibits therein referred to are produced.*
The drawing marked "Dr. C. J. Blake Drawing," not being on file in any case, will be produced at the hearing if required, and a photolithograph made from a tracing of the drawing is produced; the drawing, being in pencil, cannot be photolithographed.]

Cross Examination by L. HILL, Esq., *of Counsel for Defendants.*

Cross-Int. 4. Were the three figures that are shown on the drawing all made at the same time and during the same interview?

Ans. Yes.

Cross-Int. 5. Is this the original paper on which they were made; and are these the original sketches?

Ans. It is; they are.

Cross-Int. 6. How happened this paper to be preserved?

Ans. I preserved it as a matter of purely personal interest.

Cross-Int. 7. Of what personal interest was it to you?

Ans. A matter of scientific interest in the investigation of Mr. Bell.

Cross-Int. 8. Were any other sketches made at the same time?

Ans. There were.

Cross-Int. 9. Where are they?

Ans. I do not know.

Cross-Int. 10. Were they preserved, and if not, why not?

Ans. As I remember, there were several sketches made by Mr. Bell in pencil and one made by myself in ink on prescription blanks, which I fastened together afterwards with a metal clamp and left in a drawer in my office desk, where I found them subsequently, and gave them to Mr. Bell, as I remember, at his request.

Cross-Int. 11. When did you give them to Mr. Bell, and where?

Ans. At some time prior to July 25, 1879, at the Massachusetts General Hospital.

Cross-Int. 12. Do you remember how many sheets of prescription paper there were at that time containing sketches which you gave to Mr. Bell?

Ans. I do not.

Cross-Int. 13. Give the best of your recollection about it.

Ans. Three or four.

Cross-Int. 14. These sketches here, Exhibit 30, Dr. C. J. Blake Drawing, all are on one sheet, are they not?

Ans. Yes.

Cross-Int. 15. Have you any recollection what the sketches were on the other sheets?

Ans. I have not, except of my own only.

Cross-Int. 16. If I understand you correctly, there were one or two sheets containing sketches made at that interview by Mr. Bell in addition to the sheet here produced and in addition to the sheet upon which you sketched.

Ans. Yes.

Cross-Int. 17. Did all those sketches upon all those sheets relate to the subject of transmitting sound by electricity?

Ans. No; my own drawing was made to illustrate the structure of the organ of Corti in the human ear, with a view to explaining the manner in which its different parts vibrate sympathetically in response to different musical tones.

Cross-Int. 18. Referring to this sketch which is here in evidence, which was marked "No. 30" in the Dowd case and is now marked "Exhibit 18" in this case, please describe what the lines in Fig. 1 represent, as explained by Mr. Bell to you at the time.

Ans. I shall have to answer to the best of my recollection that Fig. 1 represents a horseshoe magnet with a framework carrying a metal reed at the end of the poles.

Cross-Int. 19. You mean a framework at the end of each pole?

Ans. I do.

Cross-Int. 20. What does Fig. 2 of the same drawing represent?

Ans. Two horseshoe magnets placed opposite to each other in circuit, and having metal reeds between the poles.

Cross-Int. 21. The little black lines between the poles represent the reeds in cross section, I suppose, do they?

Ans. Yes.

Cross-Int. 22. The reeds such as were referred to there were the ordinary metallic reeds of a musical instrument, such as an accordion, were they not?

Ans. Yes; or, as I understood Mr. Bell, simple strips of metal.

Cross-Int. 23. What does Fig. 3 of that sheet represent?

Ans. A series of metal reeds vibrating in response to the tone of a tuning fork which, in vibration, acts as a metal reed.

Cross-Int. 24. I see in Fig. 3 only one metal reed: where is the series?

Ans. Excuse my mistake; I confounded Fig. 3 and Fig. 4.

Cross-Int. 25. Your answer then would be correct if I had asked the same question as to Fig. 4, would it?

Ans. Not precisely; Fig. 3 represents a tuning fork vibrating opposite the pole of a magnet and coil, Fig. 4 a series of metal reeds arranged with a coil.

Cross-Int. 26. In Fig. 4 the five inclined lines represent the reeds, do they not?

Ans. Yes.

Cross-Int. 27. And what does the quadrilateral beneath them represent?

Ans. As I remember, a coil of wire.

Cross-Int. 28. Were the reeds to be attached to the end of the coil or not?

Ans. No.

Cross-Int. 29. The sketch looks as though the reeds were either attached to the ends of the coil or to a large black horizontal line close to the upper end of the coil: do you recollect what was really meant by that at the time?

Ans. A series of metal reeds vibrating as armatures to a magnet or series of magnets.

Cross-Int. 30. What does the heavy black horizontal line at the upper end of the coil represent?

Ans. I do not know, unless it be the base to which the metal reeds would be attached.

Cross-Int. 31. Did you at the time clearly understand Mr. Bell's explanations of the ideas which he professed to have conceived in regard to the transmission of sound by electricity, and the means which he proposed to use to carry them into effect?

Ans. I did.

Cross-Int. 32. Do you now recollect clearly and fully what those ideas were and what the means were, as he then described them to you?

Ans. Yes, as regards the main points. It was in part a desultory conversation in which other points relating to acoustics were discussed.

Cross-Int. 33. What was the date of that conversation?

Ans. October, 1874.

Cross-Int. 34. How do you fix that date?

Ans. By a letter.

Cross-Int. 35. What letter?

Ans. A letter of mine to Mr. Bell, dated Oct. 21, 1874.

Cross-Int. 36. Will you please put a copy of that letter in evidence as Exhibit Blake Letter?

Ans. I produce a copy, which is as follows: —

HOTEL BERKELEY, Oct. 21, 1874.

My dear Sir, — There is a meeting of the Boston Society of Medical Sciences on the 27th inst., and I should like very much, if you please, to show some of your tracings. If you have no photographs, I can have some made for the purpose. It will be well for us to publish at an early date, in order to lay our claim to the experiments.

I have received a letter from the Royal Institute from Elisha Gray concerning his experiments in telegraphing vocal sounds, which you will be glad to see.

Sincerely yours,

CLARENCE J. BLAKE.

PROF. A. GRAHAM BELL.

Cross-Int. 37. In that letter you refer to a letter received from Elisha Gray concerning his experiments in telepraphing vowel sounds: will you please put in evidence a copy of the letter from Prof. Gray to you?

Ans. I produce a copy; it is as follows: —

ROYAL INSTITUTION, LONDON, Oct. 2, 1874.

CLARENCE J. BLAKE, M. D.

Dear Sir, — I received your line a few days since which was forwarded to me from Chicago. I am engaged at present with Prof. Tyndall and Latimer Clark in conducting some experiments partly as a matter of scientific interest and partly with a view of certain practical applications. I shall be in New York by the time you receive this, as I sail on the 8th inst. on the White Star steamer "Adriatic." Shall be in New York a week or ten days, and may possibly come to Boston, although I think it not likely.

I shall be glad to receive the results of your experiments, and shall in turn be most happy to furnish you any information I can. I shall have my apparatus in New York, and, should you be there, or should I go to Boston, I should take pleasure in repeating some of the experiments before you. My New York address will be Everett House, Union Square.

Yours very truly,

ELISHA GRAY.

Cross-Int. 38. Did you, in the summer and fall of 1874, write Prof. Gray; and if so, how many letters?

Ans. I did; two letters.

Cross-Int. 39. Will you please put in evidence copies of those two letters?

Ans. I produce copies; they are as follows: —

BOSTON, HOTEL BERKELEY, Aug. 15, 1874.

ELISHA GRAY, Esq.

Dear Sir, — I have just learned of your experiments on telegraphic transmission of musical tones, and shall be much interested to learn more thereof, as I have been lately experimenting, in connection with Prof. A. Graham Bell, on the phonautographic value of consonant and vowel sounds as received and transmitted by the drum membrane of the human ear. In your own further experiments, it may be of value to you to know of the late work by Prof. Wolf, entitled "Speech and the Ear"; and, if our experiments this autumn prove successful, shall be happy to place their results at your disposal, and should, in return, be obliged for any further information which you may be pleased to give me concerning your own investigations. Very truly yours,

(Signed) CLARENCE J. BLAKE, M. D.,
Lecturer on Otology, Harvard Medical School.

HOTEL BERKELEY, BOSTON, Oct. 22, 1874.

My dear Sir, — Accept my thanks for your favor, dated London, Oct. 2, which came duly to hand. If possible, it will give me great pleasure to call upon you in New York, but, if unable to do so, I shall endeavor to send you photographs of some of the tracings made from vibrations of the incus. The object of the experiments has been to ascertain the character of the figures traced by a style attached to the incus, malleus and stapes, and to various points on the *membrana tympani* in response to vocal sounds. The reproduction of overtones on the plates has been very clearly shown under the microscope in a few instances, and the plates would, I think, be of some interest to you.

Respectfully your obedient servant,
(Signed) CLARENCE J. BLAKE.

Cross-Int. 40. Was the interview at which the sketches Exhibit 18 were made before or after the date of your letter of Oct. 21, 1874, to Prof. Bell?

Ans. As I remember, after.

Cross-Int. 41. At the time of that interview, did the conversation relate in any way to what Prof. Gray or others had been doing with reference to the transmission of sound by electricity?

Ans. Only in this much, that Mr. Bell reasserted his preference to pursue his investigations independently of others following the same line of research.

Cross-Int. 42. Mr. Bell, at that time, was laboring on the subject of the harmonic telegraph, was he not?

Ans. He was.

Cross-Int 43. That conversation, and the sketches which were made by him in the course of the interview, related to the harmonic telegraph, did they not?

Ans. Less to that than to his absorbing idea of the transmission of human speech, for, as I remember that interview, the transmission of single musical tones was considered only incidentally.

Cross-Int. 44. So far as you have any knowledge, Mr. Bell had not at that time discovered how to transmit articulate speech, had he?

Ans. Yes.

Cross-Int. 45. What knowledge have you that leads you to that conclusion, and when and how was that knowledge derived?

Ans. Mr. Bell's description of a means which he proposed for that purpose. I refer to his description at that time.

Cross-Int. 46. Now, as you say, you remember clearly and fully what Mr. Bell described at that time: will you please give us the description which Mr. Bell then gave you of his discovery of the transmission of speech by electricity?

Ans. The plan proposed by Mr. Bell was the attachment of a metal reed to a membrane vibrating in response to the human voice, the metal reed acting as armature to a magnet connected with another magnet at the end of a line wire, armed with a corresponding reed and membrane, the idea being that if the simple pendulous vibrations of a metal reed at one end of a line wire could be reproduced in a metal reed at the other end of the line wire, the more complicated vibrations evoked by the human voice could also be so reproduced.

Cross-Int. 47. If I understand you, Mr. Bell had not tried the experiment at that time, but only proposed it as a possible solution of the question: am I correct?

Ans. So I understood him.

Cross-Int 48. Have you stated all that you remember that he said at that time about that proposed apparatus described in your answer to Cross-Int. 46?

Ans. He spoke also of speaking directly to the metal reed, and also of the undulatory current of electricity.

Cross-Int. 49. Did he anticipate any difficulty in accomplishing the object by that proposed means, or express any fear that it might not practically answer the purpose?

Ans. None, except so far as purely mechanical difficulties were concerned in the use of animal membranes.

Cross-Int. 50. Did he express the opinion that the strength of the electric currents generated in that way would be sufficient to reproduce in the receiving reed the same vibrations as were imparted to the transmitting reed?

Ans. Yes; I am not aware that the doubt occurred to either of us.

Cross-Int. 51. You yourself had no doubt that the strength of the electric currents or impulses so generated in such an instrument would produce in the receiving reed the same vibrations as were occasioned in the transmitting reed : is that the fact?

Ans. Yes.

Cross-Int. 52. You were at the time pretty familiar with electric science, were you?

Ans. Practically, not at all.

Cross-Int. 53. Your prior experiments with Prof. Bell had not then related to the electric transmission or reproduction of sound, had they?

Ans. They had not.

Cross-Int. 54. Was that interview the first time in which Prof. Bell had spoken of or explained to you his proposed inventions for the electric transmission of sound?

Ans. It was not.

Cross-Int. 55. Was that the first time he had explained to you this apparatus which you have described in your answer to Cross-Int 46?

Ans. Yes.

Cross-Int. 56. Did you have any conversation with Prof. Bell afterwards about that proposed instrument; if so, when next?

Ans. At this same interview I proposed using a curved instead of a plane membrane to actuate the metal reed at both ends. As for instance, the drum membrane of the human ear or of the ear of some animal. This proposition was not carried out because we did not wish to dismount the human drum membrane which we were using as phonautograph, because of the difficulty of obtaining other preparations. Mr. Bell, therefore, proposed using a plane membrane.

I did not have any conversation with Prof. Bell about that proposed instrument after that interview.

[*Adjourned to Nov.* 14, *at* 9.30 A. M.]

NOVEMBER 14, 1882.

Cross-Int. 57. How long have you been acquainted with Prof. Bell?

Ans. Eleven years or thereabouts.

Cross-Int. 58. Did you see him frequently during the summer and early fall of 1874?

Ans. No.

Cross-Int. 59. Did you see him frequently between the time of that interview of October, 1874, at which the sketches were made, and the beginning of 1877?

Ans. No.

Cross-Int. 60. Did you have any talk with him about telephones between the time of that interview and the beginning of 1877?

Ans. I did.

Cross-Int. 61. When and how often?

Ans. I cannot recall dates, — at long intervals, I think, because, after the date of this interview in October, my interest in the experiments of Mr. Bell became less, as he had apparently attained the solution of the problem concerning which he consulted me; namely, the transmission of articulate speech electrically.

Cross-Int. 62. When did your interest begin to decrease in consequence of your belief that he had attained the result he was aiming at?

Ans. At or soon after the date of this interview in October.

Cross-Int. 63. How much latitude do you give the expression "soon after" in your last answer, — a week or a month?

Ans. A month is nearer the time.

Cross-Int. 64. Did you have any interview with Mr. Bell during that month?

Ans. I do not remember.

Cross-Int. 65. Your belief that he had attained the result sought for, and your consequent loss of interest in his investigations, were then based entirely upon what you learned during that interview, were they?

Ans. Yes, principally.

Cross-Int. 66. If they were in part based upon anything else, state what.

Ans. The demands made upon my time by my professional work, and the feeling that the further solution of the problem being a more purely mechanical one, I could be of less assistance to Mr. Bell than others better acquainted with mechanics.

Cross-Int. 67. Then, if I understand you correctly, your idea was that he had struck upon the correct principle to be applied, and that the further development would consist in discovery or invention of the proper means for carrying that principle into practice: am I correct?

Ans. Not precisely; rather that, having determined one mechanical means of effecting the purpose of transmitting speech electrically, further experiment in the direction of an improvement of this mechanical means would be required to perfect an apparatus for this purpose.

Cross-Int. 68. Do I understand you that you believed that the mechanical means which he described and illustrated in those sketches at that interview would in the form there shown be capable of transmitting articulate speech electrically?

Ans. Yes, as concerns the attachment of a metal reed to a membrane.

Cross-Int. 69. He did not in his sketches illustrate the attachment of a metal reed to a membrane, did he?

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Ans. I think not, but described its attachment in the place of the stylus of the phonautograph.

Cross-Int. 70. Had you been assisting him upon or with experiments with the phonautograph prior to this interview?

Ans. Yes, I allude to the *membrana tympani* phonautograph.

Cross-Int. 71. Does Fig. 3 in your sheet of sketches Exhibit No. 18 represent a telephone instrument which he proposed to use; and if not, what does it represent, and why was it made?

Ans. It does not, as I remember, but represents a magnet and coil with a tuning fork as armature, and a galvanometer in circuit, and was, I think, made in illustration of an experiment made by Mr. Bell, in which deflection of the galvanometer was caused by vibration of the tuning fork as an armature, or by movement of its mass of metal to and from the magnet.

Cross-Int. 72. Did he describe the reeds in Fig. 4 as being of the same length, or of different lengths?

Ans. Different lengths.

Cross-Int. 73. What did he state to be the object in making them of different lengths?

Ans. To provide an apparatus which would vibrate sympathetically to a number of musical tones, or to the human voice.

Cross-Int. 74. He proposed to make them of different lengths because a reed of a given length would emit a sound only in one particular key or pitch, and would respond sympathetically only to a sound emitted in that key or its octave, did he not?

Ans. Yes, that was his idea, but not so fully expressed.

Cross-Int. 75. Which of the instrumentalities shown in these four figures of your sketch No. 18 did he in that interview lay the most stress upon or regard as the most important form which he had conceived?

Ans. That represented in Fig. 4.

Cross-Int. 76. Did he describe that as having been made, or only as conceived and to be made?

Ans. I do not remember

Cross-Int. 77. Then you probably do not remember that he spoke of any results having been already attained by it?

Ans. I do not remember.

Cross-Int. 78. Was that interview in October, 1874, the first interview between you and Prof. Bell in which the employment of a membrane with a metal reed was suggested or talked about?

Ans. Yes.

Cross-Int. 79. At that interview, who first suggested the employment of a membrane, you or Prof. Bell?

Ans. Prof. Bell told me that, as the results of his experiments with a membrane phonautograph, he had conceived the idea of a way in which speech could be electrically transmitted. I replied, "I think that I know how you would accomplish it, by making a membrane actuate a metal stylus." Mr. Bell replied, "That is precisely my idea. If a membrane like the human *membrana tympani* moves a weight such as that of the ossicles, a membrane having a metal reed attached to it should move that reed in response to the human voice." His further idea, as communicated to me, was, that by means of this arrangement, undulations should be produced in an electric current corresponding to the undulations of the air produced by the human voice.

Cross-Int. 80. Then you actually described the instrument to him before he described it to you, did you?

Ans. I did not.

Cross-Int. 81. I understood you to say that before he told you how he proposed to accomplish the result, you anticipated him by suggesting the employment of the membrane and attached stylus, and that he then, in response to that suggestion, gave you to understand that that was the idea which he had had in his mind, but which, as I understand you, he had not until then described to you. If I am incorrect in this understanding, will you please correct me?

Ans. My remark to Mr. Bell concerning the attachment of the membrane and metal stylus was in the form of a question rather than a suggestion.

Cross-Int. 82. What I want to know is this: Whether you asked that question before Mr. Bell described to you the plan of attaching the metal stylus to a membrane for the purpose of transmitting speech electrically, or whether you did not ask the question till after he had described such plan; did your question come before or after his description of that plan?

Ans. Before.

Cross-Int. 83. Now, when that plan was talked over after you had suggested it in your question, did or did not Mr. Bell express any doubt in his mind as to whether the sound waves caused by the human voice would have sufficient strength to impart the necessary vibrations to the stylus or metal to cause electrical impulses through the circuit sufficient for the transmission of speech?

Ans. I think that his idea was to use a battery to provide a current.

Cross-Int. 84. What I want to know is this: Did he express any doubt whether the movements of the metal stylus so arranged would be sufficient for the purpose of transmitting speech, or did he ask your opinion upon that point?

Ans. He expressed no doubt as to the production of undulations in an electric current corresponding to the movement of a stylus, and did not ask my opinion. His idea, as I remember it, was, that in order to transmit speech it would be necessary to provide a current by means of a battery.

Cross-Int. 85. That answer does not fully meet the question which

I asked, and which, perhaps, I can simplify by putting it in this form: Did he ask your opinion as to whether the human voice could or could not vibrate a membrane with a stylus or armature attached?

Ans. Yes.

Cross-Int. 86. What answer did you give to his question?

Ans. That it could, if proportioned properly to the membrane, but that I doubted if a plane membrane would reproduce with sufficient accuracy the sound waves resulting from the human voice.

Cross-Int. 87. And then you went on to suggest bringing the metal reed in contact with the human *membrana tympani*, suitably prepared and mounted for the purpose, did you not?

Ans. Yes.

Cross-Int. 88. When did you first have knowledge that Mr. Bell had made or experimented with a telephone instrument having a membrane with armature attached?

Ans. I do not remember; I think not until 1876.

Cross-Int. 89. At that interview in October, 1874, when you suggested the use of the human *membrana tympani* and expressed a doubt as to a plane membrane being sufficient for the purpose, did you and Mr. Bell discuss pretty thoroughly your reasons for preferring the *membrana tympani?*

Ans. Yes.

Cross-Int. 90. What were those reasons as you then stated them to him?

Ans. That a curved membrane, that is to say, a membrane the centre of which is depressed below the level of its periphery, and the surface of which therefore presents a curve from the centre to the periphery, responds in sympathetic vibration to a much wider range of musical tones than a plane membrane, and that the human *membrana tympani*, being especially adapted for such vibrations, would best answer the purposes of the experiment.

Cross-Int. 91. Did you discuss with Prof. Bell the reasons why the curved membrane approximating the form of the ear would produce the expected improved result?

Ans. Yes; but very briefly.

Cross-Int. 92. What reasons were suggested for it in that discussion?

Ans. That, responding more readily in sympathetic vibrations to a wider range of tones, it would respond more readily to the human voice and reproduce more accurately the complicated sound waves therefrom resulting.

Cross-Int. 93. Yes. I understand that from your answer to Cross-Int. 90, and what I meant to ask was this: Did you discuss the reason why it would respond more readily in sympathetic vibrations to a wider range of musical sounds, or was the talk simply of the fact without investigating the reasons?

Ans. We did not discuss the reason why, the talk was simply of the fact.

Cross-Int. 94. How long had you and Prof. Bell been experimenting together with phonautographs prior to that time?

Ans. During the preceding summer we had experimented independently, but with the knowledge that each had such investigations in progress.

Cross-Int. 95. Then you had not experimented together?

Ans. No.

Cross-Int. 96. But Prof. Bell knew of your experiments, and of the apparatus you used, did he?

Ans. Of the experiments, yes; of the apparatus no. He was in Canada during the summer, where he had with him, if I remember rightly, a preparation of the *membrana tympani* to be used as a phonautograph.

Cross-Int. 97. Did you see the phonautographs with which he experimented prior to that interview of October, 1874?

Ans. I had seen the phonautograph at the Institute of Technology, but to the best of my recollection I did not see the *membrana tympani* phonautograph with which he experimented until after that interview.

Cross-Int. 98. Had he experimented with the phonautograph at the Institute of Technology?

Ans. So I understood.

Cross-Int. 99. What was the construction of that instrument?

Ans. That of the ordinary membrane phonautograph, with the stylus hinged at the periphery of the membrane and moved by a piece of wood connecting it with the centre of the membrane.

Cross-Int. 100. What was the diameter of the membrane?

Ans. I cannot remember exactly; I should think about six inches.

Cross-Int. 101. About how long was the stylus?

Ans. I cannot remember exactly; I should think between twelve and eighteen inches, including the pen at its extremity.

Cross-Int. 102. At the experiments referred to in your answer to Int. 8 in the Dowd case (incorporated into your answer to Int. 3 in this case), how many persons were present taking part in the receiving and transmitting of speech, and who were they?

Ans. I do not remember exactly; I think five or six, including Mr. Watson, Mr. Henck, Prof. Cross and Mr. Storrow.

Cross-Int. 103. Were you at the transmitting or the receiving instrument?

Ans. Receiving, principally. One pair of instruments, I think, transmitted both ways.

Cross-Int. 104. When these instruments, now numbered "36" and "37," were tested at that time, did you listen at the receiver or speak at the transmitter?

Ans. I listened at the receiver.

Cross-Int. 105. Did you test these two instruments on more than one day?

Ans. If I remember rightly, on a second occasion.

Cross-Int. 106. About the same time or long afterwards?

Ans. About the same time.

Cross-Int. 107. How came you to test them on the second occasion? What caused that test to be made?

Ans. I do not know.

Cross-Int. 108. Did they work differently on the two occasions; and if so, did they work better at the first test or at the second?

Ans. As I remember, they worked uniformly well.

Cross-Int. 109. You had no difficulty in getting articulate speech through them clearly, did you?

Ans. As I remember, I heard words distinctly, using Exhibit 37 as a receiver.

Cross-Int. 110. What transmitter was used when Exhibit 37 was used as a receiver, or did you see the transmitter that was then in use?

Ans. I did not see the transmitter then in use.

Cross-Int. 111. Did you get sentences through the receiver No. 37, or only an occasional word?

Ans. Certainly, words; either through this or another receiver used in experiments, at the same time, a connected sentence.

Cross-Int. 112. Who adjusted the instruments in those tests?

Ans. Mr. Watson.

Cross-Int. 113. How often were they adjusted during the tests?

Ans. I have evidently misunderstood your previous question, presuming adjustment to refer to the setting of the instruments for the experiment. I do not remember that they were adjusted during the experiments.

Cross-Int. 114. You don't remember about any of the instruments being adjusted during those tests in June, 1879, at Mr. Storrow's office.

Ans. I do not.

Cross-Int. 115. Do you remember any word that you received through those instruments at those tests?

Ans. Yes.

Cross-Int. 116. What words, and through what instruments?

Ans. "Holloa," "hoy," "cold," and a sentence which was, I think, "it is cold," or, "is it cold to-day"; through receiver Exhibit 37, or another receiver used in the experiments.

Cross-Int. 117. Referring now to Exhibit 37, do you positively remember any word that you received through that instrument at those tests, if so, what word or words? Give us all you can remember, but confining your answer to that particular instrument.

Ans. I cannot now remember whether the words mentioned in my previous answer were heard with this or another instrument.

Cross-Int. 118. Are you sure that any words were heard by you through this receiver No. 37?

Ans. Yes.

Cross-Int. 119. How perfectly did the instrument work? I mean No. 37.

Ans. Having no standard with which to compare it, I can only say not very perfectly, as compared with the sound of the human voice as ordinarily heard in conversation.

Cross-Int. 120. How did its working compare with that of the telephone instruments in general use in the city?

Ans. Very unfavorably.

Cross-Int. 121. Did it work well enough to be of any practical value for business purposes?

Ans. No, for a very simple reason, that after using for a time, the membrane of the transmitters, being moistened by the breath of the speakers, became relaxed.

Cross-Int. 122. How long could they be used before they would become relaxed so as to unfit them for use?

Ans. About half an hour to an hour of pretty constant use was, I think, sufficient to moisten the membranes and relax them.

Cross-Int. 123. Before the membranes became moist, how perfectly did they work as compared with the ordinary telephones now in use?

Ans. I find it very difficult to compare the two justly. With the present Bell hand telephone, used both as transmitter and receiver, the quality of the voice is plainly distinguishable, although about ninety per cent of the sound, so to speak, is not heard from the receiver. In the receivers used in these experiments the words, while distinguishable, were dull, and I do not remember that I could have distinguished the speaker by the voice.

[*Adjourned to Nov.* 15, *at* 9.30 A. M.]

NOVEMBER 15, 1882.

Cross-Int. 124. Referring to those tests made at Mr. Storrow's office with Exhibits 36 and 37, in 1879, how much time did you spend at the receiver during those tests?

Ans. I think about two minutes.

Cross-Int. 125. How much time did you spend at the other receiving instruments that were used during those tests?

Ans. I think about the same length of time.

Cross-Int. 126. How many sentences did you hear and understand through the receivers during all those tests, — anything except the sentence "it is cold," or something like that, which you referred to last evening?

Ans. Yes, I did hear other words and parts of sentences, but I do not remember what.

Cross-Int. 127. There was a good deal transmitted, I suppose, which you tried to hear at the receiver, but which you could not hear or understand, was there not?

Ans. Yes.

Cross-Int. 128. You stated in your answer to Int. 12 in the Dowd (case incorporated in your answer to Int. 3 of this deposition), that at that trial the instruments transmitted articulate speech well enough to be of some practical utility. Explain just what you meant by that.

Ans. The words which I distinguished were sufficiently clear and distinct to make the means employed for the transmission of speech in these experiments of practical value if the instruments could be made to work uniformly as well.

Cross-Int. 129. That would be true of any instrument that would transmit a word sufficiently plainly and clearly to be heard and understood at the receiver, would it not?

Ans. Yes, I should think so; in equal degree.

Cross-Int. 130. From your tests of those instruments, did you consider that they successfully solved the problem of transmitting spoken speech by electricity, assuming them to be the first instruments that ever produced the results which you witnessed?

Ans. Yes

Cross-Int. 131. During those tests at Mr. Storrow's office, who was at the receiver the greater length of time?

Ans. I do not remember; the receivers were passed from hand to hand during the transmission of speech.

Cross-Int. 132. From which of the receivers there used were the best results obtained?

Ans. I do not remember.

Cross-Int. 133. Do you recollect whether you heard any entire sentences through the lovers' telephones, Exhibits 40 and 41?

Ans. I do not.

Cross-Int. 134. Do you recollect whether you heard any entire sentences through the baby telephone, Exhibits 38 and 39?

Ans. I do not, because I do not remember through which receiver I heard the sentence given in my answer to Cross-Int. 116.

Cross-Int. 135. In your answer to Int. 14 in the Dowd case you referred to having taken part in a trial of Exhibits Nos. 19 and 22 at the workshop of Charles Williams, Jr., Court Street, Boston, and afterwards at Mr. Storrow's office: how long did the trial of these instruments at Mr. Storrow's office last, and who were present?

Ans. The duration of the trial in question I do not remember. To the best of my recollection, there were present, among others, Mr. Storrow, Mr. Watson, Prof. Cross and Mr. Berliner.

Cross-Int. 136. Did you listen at the receiver during that trial?

Ans. I did.

Cross-Int. 137. Did you hear and understand any spoken words through the receiver; if so, how many, and state any of them that you remember?

Ans. I did. I do not remember how many, and can recall only "holloa," "hoy," and "now."

Cross-Int. 138. Did you get any of those words pretty plainly, or not?

Ans. Not plainly.

Cross-Int. 139. Where was the transmitter during that experiment, in another room or in the same room? If so, how far off, and what intervened?

Ans. In another room, across the courtyard, in the rear of Mr. Storrow's office. The courtyard is about one hundred feet wide, and closed windows intervened.

CLARENCE J. BLAKE.

Attest: CHAS. H. SWAN, *Examiner.*

DEPOSITION OF EDWARD L. WILSON.

Direct Examination by James J. Storrow, Esq., *of Counsel for Complainants.*

Boston, Nov. 13, 1882.

Int. 1. State your name, age, residence, and occupation.

Ans. Edward L. Wilson; I am twenty-three years old; I live in Malden, Mass.; and am a mechanic.

Int. 2. Did you give a deposition in the case of the American Bell Telephone Company *v.* Peter A. Dowd, in the summer of 1879?

Ans. Yes.

Int. 3. Please look at the printed copy of that deposition, and say if the statements therein are correct; and if so, please read it as a part of your answer.

Ans. Yes, sir; they are correct. The deposition is as follows: —

DEPOSITION OF E. L. WILSON.

Direct Examination by J. J. Storrow, Esq., *of Counsel for Complainants.*

Boston, July 24, 1879.

Int. 1. Please state your name, age, residence, and occupation.

Ans. Edward L. Wilson; twenty; Boston, Mass.; mechanic.

Int. 2. Look at complainants' Exhibit 45, Bell's Speaking Telephone Metallic Diaphragm. [*Exhibit No.* 33 *in People's Telephone Co. case.*]* State, if you know, when it was made.

Ans. In the summer of 1876.

Int. 3. Did you during that summer assist Mr. Bell in any telephonic experiments in which that Exhibit 45 [*Exhibit No.* 33 *in People's Telephone Co. case*] was used?

Ans. Yes; I assisted him in trying it after it was made at Exeter Place, Boston, as a receiver and as a transmitter.

Int. 4. How did you use it as a transmitter?

Ans. By speaking to this iron diaphragm and covering it as much as possible with the hands, so as to form a mouthpiece with them.

Int. 5. Please look at complainants' Exhibit 43, Bell's Permanent Magnet of 1876. [*Exhibit No.* 31 *in People's Telephone Co. case.*] State when it was made.

Ans. It was made in July, 1876.

Int. 6. State when you first knew of its use in a speaking telephone.

Ans. About that time. As soon as it was made we tried it.

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* In the deposition here incorporated into Mr. Wilson's answer to Int. 3, the exhibits are numbered as in the Dowd case. The numbers in brackets are the numbers applied in the present suit of the American Bell Telephone Co. *v.* The People's Telephone Co.

Int. 7. Please look at complainants' Exhibits 15 and 16, Membrane Telephone No. 2 [*Exhibits Nos.* 36 *and* 37 *in People's Telephone Co. case*], and state whether you made them, and if so, what parts were made by you or under your directions.

Ans. Every part was made by me except the iron cones and the winding of the coils, which were done under my direction.

Int. 8. Who gave you the directions according to which you worked?

Ans. Mr. Watson.

Int. 9. What directions did he give you as to size and arrangement of parts?

Ans. He gave me a drawing containing the length of the cones, thickness and length of the core, the size of the iron used in making the right-angled back piece, the armature, the cones that connect the armature with the diaphragm, and the resistance of the coils, and told me what parchment to get for the diaphragms.

Int. 10. Was he present while you were making them?

Ans. No.

Int. 11. Did you stretch the diaphragms?

Ans. Yes.

Int. 12. What instructions did he give you as to any particular manner of stretching them?

Ans. None.

Int. 13. Please look at complainants' Exhibits 17 and 18, Baby Membrane Telephones. [*Exhibits Nos.* 38 *and* 39 *in People's Telephone Co. case.*] State whether you made them or had them made under your direction, and from whom you received your instructions about making them.

Ans. I made them. A tracing was given me — a drawing — by Mr. Watson, and he told me to make them as near the size of the drawing as possible.

Int. 14. What directions did he give you about the size of the core and the resistance of the coil?

Ans. He gave me no directions about the size of the core, only to make it the size of the core in the drawing. He told me to have the spool filled with a certain size wire. I don't remember what size.

Int. 15. What directions did he give you as to size and shape of the armature?

Ans. He told me to make the armature as wide as the iron back piece to which it is hinged.

Int. 16. What directions did he give you about the width of the iron back piece?

Ans. He gave me the width, and the thickness I got by the drawing.

Int. 17. Did you stretch the membranes on them?

Ans. Yes.

Int. 18. What directions did he give you about the membranes or about the manner of stretching them?

Ans. He told me what to use for a membrane, and I tied it on with a piece of string.

Int. 19. Please look at the complainants' Exhibits 19 and 20, Lovers' Electric Telephones. [*Exhibits Nos.* 40 *and* 41 *in People's Telephone Co. case.*] State what parts of them you made, and from whom you received your directions.

Ans. I made every part except the mouthpiece, the spool and the stretching the diaphragms. The diaphragms were on when they were brought to me by Mr. Watson, who gave me my directions.

Int. 20. What directions did he give you as to size of core and resistance of coil?

Ans. He gave me the size of the core, the diameter and length of the coil, the resistance of the coil, and told me to make the rest similar in shape to those made before, and to use my own judgment about the thickness of the back piece and armature. He did tell me something about the armature. I had some iron one sixteenth of an inch thick, and half an inch wide. I asked him if that would do. He said it would.

Int. 21. Please look at the complainants' Exhibits 23 and 24, Hand Telephone Membranes. [*Exhibits Nos.* 44 *and* 45 *in People's Telephone Co. case.*] State whether you made any part of them; if so, what part?

Ans. I made the hinged armature and the brass cone that connects it with the diaphragm.

Int. 22. Where did you get the wooden ring?

Ans. It was brought to me by Mr. Watson.

Int. 23. What directions did you receive as to the size and shape of the armature, and from whom did you receive such directions?

Ans. Mr. Watson gave me a drawing, with the shape he wished to be made, the thickness and width of the iron.

Int. 24. How do the thickness and width of the armatures of 23 and 24 [*Exhibits Nos.* 44 *and* 45 *in People's Telephone Co. case*] compare with the thickness and width of the armatures of 19 and 20? [*Exhibits Nos.* 40 *and* 41 *in People's Telephone Co. case.*]

Ans. I think the armatures of 23 and 24 [*Exhibits Nos.* 44 *and* 45 *in People's Telephone Co. case*] were made before those of 19 and 20. [*Exhibits Nos.* 40 *and* 41 *in People's Telephone Co. case.*] They are both made of the same iron.

Int. 25. Who stretched the diaphragms on 23 and 24? [*Exhibits Nos.* 44 *and* 45 *in People's Telephone Co. case.*]

Ans. I did.

Int. 26. What directions did you have about stretching the diaphragm?

Ans He told me to stretch them the way I always had done, and shellac them, to prevent their becoming loose from being spoken to.

[*Adjourned to July* 25, 1879.]

Cross Examination by Causien Browne, Esq., *of Counsel for Defendants.*

Boston, July 25, 1879.

Cross-Int. 27. Have you been employed by any one at any time in or about the making of telephones, besides the work you did in making the particular telephones mentioned in your direct examination?

Ans. No, I have not.

Cross-Int. 28. What has been your employment during the last three or four years?

Ans. I have been employed in assisting Mr. Bell and in the factory of Charles Williams, Jr.

Cross-Int. 29. Mr. Charles Williams, Jr., manufactures the Bell telephones, doesn't he?

Ans. Yes.

Cross-Int. 30. What is the nature of your employment in his place?

Ans. Working upon different kinds of electrical work.

Cross-Int. 31. How long have you been in Mr. Williams's employment?

Ans. About two and a half years.

Cross-Int. 32. Do you mean to be understood by your first answer this morning that you have never done any work on telephones at Mr. Williams's place until you made the exhibit telephones by Mr. Watson's directions, as mentioned in your direct examination?

Ans. I have done a very little work on our regular instruments, the Bell telephones.

Cross-Int. 33. Did you make Exhibit 45 [*Exhibit* 33 *in People's Telephone Co. case*], or any part of it?

Ans. No, I did not.

Cross-Int. 34. I suppose that, prior to making and completing the exhibit telephones in pursuance of Mr. Watson's directions, you had seen no models of any telephones, had you?

Ans. Yes, I had.

Cross-Int. 35. Any except those that you had had to do with while working under Prof. Bell?

Ans. No.

Cross-Int. 36. How long did you work under him?

Ans. About two months.

Cross-Int. 37. When was it?

Ans. In the summer of 1876.

Cross-Int. 38. What telephones or parts of telephones having stretched membranes had you seen before you made the exhibits by direction of Mr. Watson, as testified yesterday? I mean, of course, electric telephones.

Ans. None except those used by Mr. Bell in the summer of 1876, and I have seen them since lying around.

Cross-Int. 39. Do you mean the same ones you saw in 1876, or other stretched membrane telephones?

Ans. I suppose they were the ones used by Mr. Bell. There were very few of them.

Cross-Int. 40. How many do you remember altogether, first and last?

Ans. There may have been fifteen or twenty.

Cross-Int. 41. Did you have anything to do with the making of any of them, or with any alteration or repairing of any of them?

Ans. I had nothing to do with the making of them, but have put on several new membranes.

Cross-Int. 42. Have you not assisted Prof. Bell in some of his experiments since the summer of 1876?

Ans. Not that I remember.

Cross-Int. 43. Is the whole of your employment at this time with Mr. Charles Williams in this city?

Ans. No; I am in the employ of the Bell Telephone Company.

Cross-Int. 44. In what capacity?

Ans. Starting telephonic exchanges, — starting the apparatus and teaching the operators.

Cross-Int. 45. Is Mr. Charles Williams, Jr., the sole manufacturer of the Bell telephones?

Ans. I think he is, at present.

Cross-Int. 46. Your work in starting telephonic exchanges is done at different distant towns, is it not?

Ans. Yes; wherever I am sent by the company.

Cross-Int. 47. How long have you been on this duty of starting telephonic exchanges?

Ans. About one month.

Direct Examination resumed.

Int. 48. Are these instruments, the Philadelphia Centennial Telephones 38, 39 and 41 [*Exhibits Nos.* 26, 27 *and* 29 *in People's Telephone Co. case*], among those which you say you have seen?

Ans. Yes.

E. L. WILSON.

Attest: W. P. PREBLE, Jr., *Examiner.*

[*Complainants' counsel produces for inspection the exhibits therein referred to.*

Mr. Hill waives cross examination, but asks that the exhibits here produced shall be marked as of this case and produced at the hearing; otherwise he will object to the deposition of this witness.]

EDWARD L. WILSON.

Attest: CHAS. H. SWAN, *Examiner.*

AMERICAN BELL TELEPHON

PHONE COMPANY,-3

CIRCUIT COURT OF THE UNITED STATES.

SOUTHERN DISTRICT OF NEW YORK.

IN EQUITY.

THE AMERICAN BELL TELEPHONE COMPANY, AND THE METROPOLITAN TELEPHONE AND TELEGRAPH COMPANY, COMPLAINANTS,

vs.

THE PEOPLE'S TELEPHONE COMPANY, JOSEPH LOTH, JULIUS BIEN, MARCUS MARX, AUGUST H. GIRARD, JOHN N. GOODWIN, FRANK A. KLEMM, ERNEST MARX, EDGAR W. CHELLIS, RICHARD C. McCORMICK, HENRY D. COOKE, JR., MAX L. GUTMAN, MORITZ LOTH, AND SIMON WOLF, RESPONDENTS.

EVIDENCE FOR COMPLAINANTS IN REPLY,

Taken pursuant to the sixty-seventh rule of the Supreme Court of the United States, in equity, as amended, before me,
FRED. M. OTT, *Examiner.*

ROOM NO. 5, BOLTON'S HOTEL,
HARRISBURG, PENNA., July 13, 1882, 3.30, P. M.

Examination commenced.

Present: Mr. Storrow for complainants; and Mr. Hill and Mr. Jacobs for respondents.

HARVY W. WHITEHEAD being produced, sworn, and examined, saith:

Examined by Mr. Storrow:

Q. 1. State your age, residence, and occupation?

Ans. I will be twenty-eight the seventh day of next month; residence, Duboistown, Lycoming county, Penna.; occupation at present, engaged as clerk for the Lycoming county commissioners.

Q. 2. Do you have charge of the records of the county commissioners of that county?

Ans. I have.

Q. 3. If among those records you have the inquest held in the year 1867, on the body of George Miller, will you please produce it?

Ans. I will. (Witness produces paper.)

Q. 4. Will you please send it to the examiner, that he may take down a copy of it as a part of your answer, and in reading it, read everything that is written on the paper? State first whether the paper you now produce, and are about to read, is the original inquest on file in the commissioner's office?

Ans. It is (witness reads paper as follows):

Commonwealth of Pennsylvania, Lycoming county, ss:

An inquisition indented and taken at the city of Williamsport, in the county of Lycoming, the fifteenth day of October, in the year of our Lord one thousand eight hundred and sixty-seven, before me, John Hepburn, J. P. in and for said county, upon the view of the body of a man named George Miller, by a pass-book found upon his person, then and there lying dead upon the railroad track, in front of the depot, in the city of Williamsport, upon the solemn affirmations of R. C. Swan, C. P. Colver, and J. F. Vanderslice, W. W. Hicks, J. C. Peterman, and William Bancard, good and lawful men of the county aforesaid, to inquire on the part of the Commonwealth when, where, and how, and after what manner the said George Miller came to his death, do say upon oaths of William Frizzel and David Ferguson, that the said George Miller came to his death accidentally, by the cars passing over him, and crushing his head and, moreover, the jurors, upon their oaths, do say that the said George Miller, at the time of his death, had upon his person one pocket knife, three hundred and ninety-four dollars and forty cents; also, one carpet sack, containing one shirt and one handkerchief, which is now in the hands of R. C. Swan, foreman of the jury.

In witness whereof, as well the aforesaid justice of the peace, as the

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jurors aforesaid have to this inquisition, put their hands and seals on the day and year above mentioned.

John Hepburn, *J. P.* [seal.]
R. C. Swan, *Foreman,* [seal.]
C. P. Colver, [seal.]
J. A. Vanderslice, [seal.]
W. W. Hicks, [seal.]
J. C. Peterman, [seal.]
W. H. Bankart, [seal.]

John Hepburn, J. P., viewing a dead body, . .	$2 75
Summoning and qualifying in inquest, . . .	1 37
Summoning and qualifying each witness, 25, . .	50
R. C. Swan, foreman, ...	50
Charles P. Colver, ...	50
J. A. Vanderslice, ...	50
W. W. Hicks, ...	50
J. C. Peterman, ...	50
W. Bankart, ...	50
(Witness) David Ferguson, ...	31
W. Frizzel, ...	31
	$8 24

Received payment.

Wms.'port, Nov. 21, 1867.

John Hepburn, *J. P.*

[Endorsement.]

Nov. 25, 1867. Approved: Inquest necessary.

Per cur.

I. Smith, *A. J.*

Q. 4. The paper which you have just produced and read, seems to be a receipt for the expenses of the inquest, as well as the inquest itself. Who paid those expenses, if the records of the county show?

Ans. It does. Lycoming county paid the expenses, from the records.

Q. 5. If you have the stub of the order-book, or drafts on the treasurer, please point out the record of this payment on the stub and read it?

Ans. This is the order-book from which the orders on the treasurer for the payment of money were drawn for the year 1867. The stub is as follows: "No. 134, Dec. 31st, 1867, W. T. I. Painter and others, for holding inquisitions, 1867, $127 29.

Q. 6. Have you examined all the inquisitions in the county for that year, and the receipts on each, and ascertained whether the costs of all of them put together amount to the sum named in the stub you have just read?

Ans. I have, and find that they amount to $126 29.

Q. 7. I infer from your last answer that the clerk who footed them up in 1867 made a mistake of just one dollar in adding them up. Does that appear to be the fact about it?

Ans. I believe that it was a clerical error.

Q. 8. Have you here all the other Lycoming county inquests for 1867; and if so, will you please produce them for the inspection of counsel?

Ans. All that the records of the county show to have been held during that year.

Q. 9. Is it by law the duty of the county to pay the expenses of inquests on dead bodies found in the county?

[*Objected to by Mr. Hill as incompetent and hearsay, and because the witness is not proved to be an expert as to what was the law at that time.*]

Ans. It is.

Cross-examination waived by counsel for respondents.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 13th day of July, 1882.
FRED. M. OTT, *Examiner.*

HARVY W. WHITEHEAD.

ABRAHAM PAGE being produced, sworn, and examined, saith:

Examined by Mr. Storrow:

My age is sixty-nine; residence, Williamsport, Lycoming county, Penna.; occupation, cabinet-maker and undertaker.

Q. 1. You have just heard read an inquest on the body of George Miller, killed on the railroad track at Williamsport, in October, 1867. Did you provide the coffin and grave clothes for him, and attend to the undertaker's work in Williamsport on his body?

Ans. Yes, sir; I did.

Q. 2. If you have your books of account, in which you made the original charges for that work, will you please to produce them and read them?

Ans. Yes, sir. This is what we call the work-book,—a book to enter

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those works in just as they are done each day. (Witness reads:) "1867, October 16, one walnut coffin and case, six and a half feet, P. & E. r. r., George Miller, $23 00." I also have a ledger account relating to the same transaction, which is as follows:

"*Philadelphia and Erie R. R. Co.:*

1867.		*Cr.*	*Dr.*
October 16.	To one walnut coffin and case, bg. George Miller, ...		$23 00
" "	one shroud and clothing, . . .		14 00
			$37 00
Mar. 24.	By cash paid by N. C. R. Rway, . . .	$37 00"	

Q. 3. Are all these entries in your handwriting?

Ans. Yes, sir.

Q. 4. Were they made by you at the time of the dates and of the transaction?

Ans. Yes, sir.

Q. 5. Do they contain true accounts of the transactions?

Ans. Yes, sir.

Q. 6. Please look at the railroad voucher which has been produced by Mr. Broderick, and put into his deposition, and state whether the receipt at the foot of it is signed by you?

Ans. That is correct. It was signed by me.

Q. 7. Is that the voucher and receipt on which you obtained from the Northern Central railroad payment for the charges you have read relating to the body of George Miller?

Ans. Yes, sir.

Q. 8. Who directed you to furnish this coffin and clothing, and take charge of the body?

Ans. He was superintendent of the road there, but what his name was I don't know. I think it was Mr. Black was there at that time.

Q. 9. Do the Philadelphia and Erie road and the Northern Central road use the same depot at Williamsport, and did they at that time?

Ans. Yes, sir.

Q. 10. Which is the road that runs from Harrisburg to Williamsport?

Ans. The Northern Central runs from Harrisburg to Sunbury, and the P. & E. from Sunbury to Williamsport.

Q. 11. I see that you have no charge for burying. I suppose from that, that the body was delivered to some one else for burial. Was that the fact?

Ans. To the best of my knowledge it is. I have got no charges for burying. I always charge for the grave when I do that, but there is none in this case.

Cross-examination waived by counsel for respondents.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 13th day of July, 1882.
FRED. M. OTT, *Examiner.*

A. PAGE.

W. J. BRODERICK, being produced, sworn, and examined, saith:

Examined by Mr. Storrow:

My age is forty-one; residence, Baltimore, Md.; occupation, clerk in the auditor's office of the Northern Central railway.

Q. 1. Will you produce the voucher for the payment by your company of thirty-seven dollars to A. Page, Son & Co., March 24, 1868?

Ans. Yes, sir. Here it is. (Witness produces the paper, which is as follows:)

"No. 28. LOSS FROM INJURIES TO INDIVIDUALS, &c. ACCOUNT.

Northern Central Railway Company, lessee.

To A. PAGE, SON & CO., WMS.PORT, *Dr.*

14.

1867. For the following, as per bill rendered, with affidavit annexed, and filed in auditor's office, at Baltimore, viz: E. S. B.

	Dollars.	Cents.
Oct. 16. 1 coffin, case, &c., ...	23	00
Under clothing, ...	14	00
	37	00

For man killed on P. & E. road at Wms.port.

Passenger station, Oct. 16, 1867.

Payable in current funds at Lumberman's National Bank, Wms.Port, Pa.

J. E. C.

I certify that the above claim is just; that it has been duly authenticated, and that the items therein specified are correct.

J. N. DUBARRY. *General Supt.*

The above account is duly authorized; it has been examined by me, found correct, and hereby approved.

S. LITTLE, *Auditor.*

Received, March 24, 1868, of J. S. Leib, treasurer of the Northern Central R. W. Co., lessee, thirty-seven $\frac{x}{100}$ dollars, in full of the above account, and for all claim against the said company for service, loss, damage, personal injury, or otherwise, to date.

U. S. inter. revenue stamp. 2 cts.

$37 00. A. PAGE, SON & Co.

Read this. ☞The above receipt must be dated and signed by the party in whose favor this voucher is made out; or when signed by another party, the authority for so doing must in all cases accompany it; and this receipt must not be cut off from the body of the voucher.

[Endorsement.]

Northern Central Rail Way Company, lessee.
Elmira and Williamsport R. R.
No. 28.
Conducting transportation, loss from injuries to individuals, &c.
A. Page, Son & Co.
For January, 1868. $37 00.
Office Calvert station, Baltimore.
Theo. F. Scheffer, Printer, Harrisburg."

Cross-examination waived by Mr. Hill:

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 13th day of July, 1882.
FRED. M. OTT, *Examiner.*

W. J. BRODERICK.

Adjourned until July 14, 1882, at ten, A. M.

JULY 14, 1882.

Examination resumed pursuant to adjournment.

Present, same counsel.

WILLIAM DARR being produced, affirmed, and examined, saith:

Examined by Mr. Storrow:

My age is about fifty-eight years; residence, corner of Market and Eleventh streets, Harrisburg, Penn'a; my occupation is keeping a small candy shop, cigars, and tobacco.

Q. 1. Did you ever live at Eberly's Mills, or Milltown; and if so, when, and when did you leave it?

Ans. I lived there twenty years; I left in 1870.

Q. 2. Did you know George Miller, who was killed on the railroad at Williamsport, in October, 1867?

Ans. Yes, sir; I knew him. He was a brother-in-law of mine.

Q. 3. Did you go up to Williamsport for his body?

Ans. Yes, sir; I did.

Q. 4. Were you an undertaker at that time?

Ans. Yes, sir; I was.

Q. 5. Did you get his body at Williamsport and bring it down here?

Ans. Yes, sir; I fetched it to Bridgeport at four o'clock in the morning.

Q. 6. Who hauled it from Bridgeport to Milltown?

Ans. Harry Gardner.

Q. 7. Was there a funeral at Milltown, and did you go to it?

Ans. Yes, sir; there was a funeral there, and I was with it.

Q. 8. It has been stated, that at the time he was killed he had with him about four hundred dollars belonging to Mr. Daniel Drawbaugh; did Mr. Drawbaugh ask you to get that money and bring it to him, and did he give you an order for it?

Ans. Yes, sir; he did.

Q. 9. The inquest states that a sum of money, a little less than four hundred dollars, was found in the pocket of the dead man, and was, at the time of the inquest, in the possession of Mr. Swan, foreman of the coroner's jury; did Mr. Swan give that money to you at Williamsport?

Ans. Yes, sir; he did.

Q. 10. What did you do with it?

Ans. I stuck it in my pocket-book. I had a coat on similar to this, and I put it in my side pocket. It was rolled together, and I put a little newspaper around it.

Q. 11. Whom did you give the money to?

Ans. I gave it to Daniel Drawbaugh.

Q. 12. Did you give him the whole of it, just as you received it?

Ans. Yes, sir; I did.

Q. 13. Did anybody come down from Williamsport with you and the body; and if so, who?

Ans. Yes, sir; Mr. Swan; I think his name was Swan.

Q. 14. Was it the same Mr. Swan from whom you received the money?

Ans. Yes, sir.

Q. 15. Did the railroad company furnish passes to come down with from Williamsport to Bridgeport?

Ans. No, sir; they didn't.

Q. 16. Who paid your expenses on that trip?

Ans. I paid the half of them myself, and Drawbaugh paid the other half.

Q. 17. Do you remember how much they amounted to?

Ans. As near as I can, about seven dollars and a half.

Q. 18. While you lived at Eberly's Mills, did you frequently go to Mr. Drawbaugh's shop?

Ans. I was over there often; yes, sir.

Q. 19. I now show you five instruments marked "F," "B," "C," "C re-produced," and "I," and ask you whether you ever saw any of them at Mr. Drawbaugh's shop?

Ans. No, sir; I never saw any of them.

Q. 20. Did you ever see any talking-machine at Mr. Drawbaugh's shop?

Ans. No, sir; I didn't.

Q. 21. Did you ever hear of any talking-machine there?

Ans. No, sir; I didn't.

Q. 22. Did Mr. Drawbaugh come to you about a year ago and ask you about telephones or talking-machines?

Ans. Yes, sir; he did.

Q. 23. Did Mr. Drawbaugh come to you this morning and talk with you about George Miller?

Ans. Yes, sir; he did.

Q. 24. Did he speak about talking-machines to you this morning?

Ans. No, sir; he didn't.

Cross-examined by Mr. Hill:

Cross-Q. 25. When Mr. Swan came down with the body and with you, did he go to Bridgeport?

Ans. Yes, sir.

Cross-Q. 26. Did he go any further than Bridgeport?

Ans. He told me he was going to Harrisburg.

Cross-Q. 27. How long did he remain at Bridgeport?

Ans. About half an hour.

Cross-Q. 28. Where did he go then?

Ans. He told me he was going to Harrisburg, and I saw him start for the toll-bridge. He said he was going to walk over. This was down at the railroad bridge, where we stopped with the corpse.

Cross-Q. 29. Was that the last you ever saw of him?

Ans. Yes, sir; that was the last time I saw him.

Cross-Q. 30. Where did Mr. Swan hand you the money?

Ans. He handed it to me in some restaurant.

Cross-Q. 31. In what town?

Ans. Williamsport.

Cross-Q. 32. Was any person else present when he handed you the money?

Ans. There was two other men present, but they were strangers to me.

Cross-Q. 33. Did you give Swan a written receipt for the money when you got it from him?

Ans. No, sir; I didn't.

Cross-Q. 34. Was the money rolled up and covered with a piece of newspaper when he gave it to you?

Ans. No, sir.

Cross-Q. 35. The money was in bills, I suppose, was it not?

Ans. I guess so; I didn't see it apart.

Cross-Q. 36. You didn't open it then to examine it?

Ans. No, sir; I didn't.

Cross-Q. 37. I suppose you and Mr. Swan took a drink together in the restaurant?

Ans. Yes, sir; he treated me to some oysters, and we took some whisky with it.

Cross-Q. 38. While you and Swan were together on that trip, did you have your suspicions excited in any way about Swan?

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Ans. I had; he invited me three or four times into a sleeping-car, and I had an idea he was going to take the money from me.

Cross-Q. 39. When you arrived with the body at Bridgeport, was anybody there waiting to meet you, or did you have to go home to get a conveyance to take it home?

Ans. I waited an hour, and then Harry Gardner came with a conveyance.

Cross-Q. 40. Swan had left before Harry Gardner arrived, had he?

Ans. Yes, sir; about a half an hour.

Cross-Q. 41. Did Harry Gardner have a carriage to take the body away?

Ans. He had my spring-wagon and his horse.

Cross-Q. 42. Did you see Daniel Drawbaugh that day, after you got the body to Milltown?

Ans. I saw him right away when I got home with the corpse.

Cross Q. 43. That was the first time you had seen him since you had gone to Williamsport to get the body, was it?

Ans. Yes, sir; the first time.

Cross-Q. 44. Did you give him the money all rolled up in a paper, just as you had it in your pocket?

Ans. Yes, sir; I did.

Cross-Q. 45. And you never knew whether the money was in bank bills or in any other form, did you?

Ans. No, sir; I knew it when Drawbaugh unwrapped the newspaper off; but I had never looked at them.

Cross-Q. 46. Who put that newspaper around the money at Williamsport?

Ans. I don't know who put that around.

Cross-Q. 47. You didn't put it around, did you?

Ans. I put part of it around; I did that to make it stronger, because I had no pocket-book, and was just carrying it in my pocket; there was a newspaper around, and I put a second newspaper around.

Cross-Q. 48. When Drawbaugh unrolled the newspaper and saw that it was really money, did he roll it up again and put it in his pocket and take it away?

Ans. I don't mind of that, what he done.

Cross-Q. 49. Your only recollection about it is, then, that you handed him the roll, and that he unrolled the newspaper and looked at it?

Ans. Yes, sir.

Cross-Q. 50. As you hadn't had the money open, but had it rolled up all the time, you didn't consider it necessary to have it counted, I suppose?

Ans. No, sir.

Cross-Q. 51. When did Drawbaugh pay his half of the expenses?

Ans. Right away when I went to Williamsport.

Cross-Q. 52. He furnished the money in advance then?

Ans. Yes, sir.

Cross-Q. 53. How much money did he advance for the purposes of that trip?

Ans. About three dollars and a half.

Cross-Q. 54. Was that just to pay your fare?

Ans. Yes, sir.

Cross-Q. 55. How long were you at Williamsport?

Ans. I was there four hours.

Cross-Q. 56. What time of day did you leave Williamsport to return?

Ans. At twelve o'clock, midnight.

Cross-Q. 57. Why did Swan come down on the train with you?

Ans. He told me he was going to arrest a man in Harrisburg.

Cross-Q. 58. Was he, Swan, a constable, or policeman, or detective, or what?

Ans. I think he was a policeman at that time.

Cross-Q. 59. Can you swear positively that the name of the man who gave you the money in Williamsport was Swan?

Ans. I never heard anything else but that; they were all strangers to me; it was the first time I was there, and the last time, too.

Cross-Q. 60. Do you know his first name?

Ans. No, sir; I don't.

Cross-Q. 61. You were not present at the inquest on the body of George Miller, at Williamsport, were you?

Ans. No, sir; I wasn't.

Cross-Q. 62. Then you don't know, of your own personal knowledge, whether the man who gave you the money at Williamsport had anything to do with that inquest or not, do you?

Ans. No, sir.

Cross-Q. 63. When you lived at Eberly's Mills, did you live in the village or outside of it?

Ans. I lived in it.

Cross-Q. 64. In what house?

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Ans. A stone house close to the mill.

Cross-Q. 65. Who owned the house?

Ans. Mr. Christian Eberly.

Cross-Q. 66. When did you first live in that house, and how long did you live there?

Ans. I lived there twenty years. I moved away thirteen years ago.

Cross-Q. 67. In what month did you move away?

Ans. The last day of March I moved away.

Cross-Q. 68. You are sure it was thirteen years ago, the last day of last March, are you?

Ans. Yes, sir; that we moved over here, and left that place.

Cross-Q. 69. At that time you moved to Harrisburg?

Ans. I moved to Highspire, Dauphin county, Penna.

Cross-Q. 70. How long did you live at Highspire?

Ans. I lived there ten years.

Cross-Q. 71. And then you moved to Harrisburg?

Ans. I moved from Highspire to Steelton. I lived at Steelton three years.

Cross-Q. 72. When did you move to Harrisburg?

Ans. This last April, the first or second day; I don't just mind, but I think it was the first, though.

Cross-Q. 73. What was your business when you lived at Steelton?

Ans. The two first years I kept a boarding-house; the third, the same I am at now, a little tobacco shop and segar shop.

Cross-Q. 74. You boarded workmen in the steel works, I suppose; did you?

Ans. Yes, sir.

Cross-Q. 75. What was your business at Highspire when you lived there?

Ans. Part of the time I was in the undertaking business, and part of the time I was peddling. I was five years in the undertaking business at Highspire.

Cross-Q. 76. From the last day of March, 1870, to the time when you moved to Harrisburg, was only twelve years, so that you must have moved away from Milltown on the last day of March, 1869, must you not?

Ans. I always thought it was 1870. I might, may be, have been mistaken.

Cross-Q. 77. When you lived at Eberly's Mills, did anybody live in the same house with you. If so, who?

Ans. Three or four families. I really forget their names. I occupied the stone part, and the other families were in the frame part. There were several tenements in one long building, partly frame and partly wood. Each tenement had its own front door.

Cross-Q. 78. Who lived there in that building the last year that you lived there?

Ans. Henry Yetter lived in it the last year. He had it to himself the last year. He kept a hotel, and needed the whole house.

Cross-Q. 79. Where did Daniel Drawbaugh live the last year that you were there?

Ans. He lived in the house next to the blacksmith-shop there. I think he owned it at one time. Had bought it from his pap, or he bought it from Mr. Hauck, who had bought it from old Mr. Drawbaugh. That was the way, I think.

Cross-Q. 80. Where did he have his workshop?

Ans. He had one back at the mill there. He had two. He had one down at the creek, where they were making these faucets.

Cross-Q. 81. Were you in his shop down at the creek, where they were making faucets?

Ans. I got in there sometimes. Not as much as I did up at the mill.

Cross-Q. 82. What did you go in there for down at the creek. To see them make faucets?

Ans. Yes, sir.

Cross-Q. 83. Then I suppose you didn't pay much attention to anything else there except the making of the faucets?

Ans. Yes, sir; that was about all.

Cross-Q. 84. When you would be down there, you would find Drawbaugh at work about the faucet business, would you?

Ans. Yes, sir.

Cross-Q. 85. I have heard that you once got off a very good joke on Drawbaugh while you lived there. He was telling you that he had a machine with which he could talk across the Atlantic ocean, and you replied, that he had better limit his operations to Yellow Breeches creek before he tried the Atlantic ocean.

Ans. That is so; that is what I told him.

Cross-Q. 86. Your words, as I have heard them repeated, were about as follows: "Dan, you had better try the Yellow Breeches first before

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you try the Atlantic ocean;" is that substantially the reply you made to him?

Ans. Yes, sir; that is about it. He said the time was coming when they could talk across the sea. I said, "Oh! take the Yellow Breeches first."

Cross-Q. 87. How long was that before you moved away from Eberly's Mills?

Ans. I don't know whether I can study that up or not; I know it was a couple of years before I moved over here.

Cross-Q. 88. Do you mean to say that it was just two years before or might it have been more than two years?

Ans. About two years before I moved over here.

Cross-Q. 89. Where was that conversation, in what building or place?

Ans. In the shop next to Eberly's Mill. One was called the upper shop, and the other the lower shop. It was in the upper shop.

Cross-Q. 90. How happened the conversation to start on the subject of talking across the sea?

Ans. I hardly mind that—exactly how it happened. I don't think much was said. He was tired, and leaning against the bench and said: "Bill, do you believe the time is coming when we can talk across the sea?" I said, "Oh! you had better try the Yellow Breeches first." I said too, "What is the matter with you Dan, are you going crazy?" I don't think there was much more than that said, before or after.

Cross-Q. 91. Didn't he say, also, that he was going to do it, or had a machine that would do it?

Ans. No, sir; he said nothing of the kind.

Cross-Q. 92. He dropped the conversation after your reply to him, did he?

Ans. Yes, sir.

Re-direct by Mr. Storrow:

Q. Q. 93. You have been asked about the purposes for which you went to Mr. Drawbaugh's shop. Did you ever do any work there for yourself or for him?

Ans. I done some for him.

Q. Q. 94. What did you do for him?

Ans. I made some stave-jointers and stave-cutters. I worked at them.

Q. Q. 95. Did you ever work on any models for him?

Ans. No, sir; I didn't.

Q. Q. 96. After you had given him the money which you brought from Williamsport, did he ever complain to you that there was near a hundred dollars of it missing?

Ans. No, sir; he didn't.

Re-cross by Mr. Hill:

Re-cross-Q. 97. The work which you did on the stave-jointers and stave-cutters was done before the rebellion, was it not?

Ans. Yes; I think it was.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me this 14th day of July, 1882. } WILLIAM DARR.

FRED. W. OTT, *Examiner.*

Recess for dinner, until 2.30, P. M.

JULY 14, 1882, 3, P. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

HENRY R. MOSSER being produced, affirmed, and examined, saith:

Examined by Mr. Storrow:

My age is fifty-four years; residence, New Cumberland, Cumberland county, Penna.; occupation, lumber merchant.

Q. 1. How long have you been engaged in the lumber business, and had saw-mills or planing-mills there?

Ans. Ever since my majority. I first had a planing-mill about thirty years ago.

Q. 2. Do you know Daniel Drawbaugh, of Eberly's Mills, and how long have you known him?

Ans. I know him, and have known him for probably thirty-five years.

Q. 3. Please look at the newspaper, *Baltimore American*, for Saturday, February 2, 1878, and tell me whether you wrote the article therein, entitled "A letter from New Cumberland?"

Ans. I did write that letter.

Q. 4. That letter is dated January 31, 1878. Was that the time when you wrote it?

Ans. My recollection is that it was.

Q. 5. Will you please read the article to the Examiner, that he may make it a part of your answer?

Ans. Yes, sir.

LETTER FROM CUMBERLAND.

A new route to Baltimore.—Proposed bridge over the Susquehanna.—A wonderful clock.—Crops in Southern Pennsylvania.

[Special correspondence of the AMERICAN.]

NEW CUMBERLAND, PA., *January* 31, 1878.

I have been a reader of the *American* for over thirty years, but do not remember having seen a letter from New Cumberland. The *American* is found in most of our business offices daily, and is a favorite with our merchants. We have been bound to Baltimore, commercially, by iron bands since 1851, and are now threatened with a double bond in the erection of an iron bridge at this place, which is to connect ultimately Boston, *via* Poughkeepsie and Harrisburg and Hanover with Baltimore and the South. The bridge company has a charter, and it is asserted that it will be speedily built.

Our business men have long had an extensive and favorable acquaintance with Baltimore merchants and, like all Pennsylvanians residing south of the Susquehanna, have preferred to deal there, but railway facilities have led them largely away from Baltimore, and it is not strange to find much satisfaction expressed at the prospect of this second line to their favorite city. The rich mineral and agricultural country through which it will pass, will give reasonable assurance of success, and its connection with the new line now in operation from Milton, Muncy, and Williamsport, and now to Jersey Shore, and soon to Lock Haven, will give the line quite an extended run among the coal and lumber points in Pennsylvania, and give Baltimore two competing lines through the heart of Pennsylvania.

We have a really scientific study in motive power, which has been made after years of patient study, by Mr. Daniel Drawbaugh. He has perfected a clock without spring or weight, and is never wound up, but will run for centuries, so far as motive power is concerned, or so long as electricity and the magnet remain the subtle agencies of mechanical power. It is a real scientific production, and a wonder well worth a visit even from Baltimore. It will doubtless come into general use, but Mr. Drawbaugh, like many other ingenious inventors, is not financially able to place this valuable clock quickly before the public.

*

AMERICAN BELL TELEPHO

The crop prospect for wheat in York, Cumberland, and Franklin counties is very good, notwithstanding the absence of snow. X.

Q. 6. Were you at Mr. Drawbaugh's shop at Eberly's Mills, and did you see some electric or magnetic clocks there shortly before you wrote that article?

Ans. I was there, and saw some electric clocks.

Q. 7. Did he give you any explanation about the clocks?

Ans. He did.

Q. 8. Had you read in the papers at that time that electric speaking telephones were getting into use in the community?

Ans. I had.

Q. 9. Did you have any conversation with Mr. Drawbaugh at that visit about electric speaking telephones?

Ans. I had.

Q. 10. Will you state the substance of that conversation?

Ans. My recollection is, that he showed me some parts or work that he said he had been working upon for some time previous.

Q. 11. Did he state how long he had worked at them?

Ans. Not to me.

Q. 12. Did he state whether he had given up working at them, or abandoned them, or anything in relation to that; if so, what was it.

Ans. I don't think he did.

Q. 13. What was your object and purpose in writing that newspaper article?

[*Objected to by Mr. Hill as immaterial and incompetent.*]

Ans. I was very much interested in the clock, and desired to draw attention to the discovery, that Mr. Drawbaugh might be benefited thereby.

Q. 14. If he had made any statements to you which led you to believe that he was really the first inventor of the speaking telephone, would you have mentioned that in your article also?

[*Objected to as hypothetical and incompetent, and calling for a mere matter of present opinion.*]

Ans. I think I would.

Q. 15. Did you go there purposely to see his clock, or for some other purpose, on that occasion?

Ans. I went there to see Mr. Drawbaugh on business. I also desired to see his clock, of which I had heard a good deal.

Q. 16. Had you ever heard, up to that time, that he had made any electric speaking telephones?

Ans. I may have heard of it; I do not now remember.

Q. 17. Please to look at the instruments now shown you, and see if any of them look anything like the telephones or parts of telephones he showed you on that occasion?

Ans. I think I recognize that ("B") as one, or something like one he showed me.

Q. 18. Do you recognize these two large ones, ("H" and "J.")

Ans. I have no recollection of seeing them.

Q. 19. I now show you all the other original instruments which have been put in evidence by the defendants, and I ask you which, if any of them, you saw at that time?

Ans. Mr. Drawbaugh showed me several parts of his telephone, only one of which I definitely seem to remember; that is this one, (indicating "B.")

Q. 20. In your conversation with Mr. Drawbaugh on that occasion, did he appear to be much interested in telephones, or what was he chiefly interested in?

Ans. My recollection is, that in his conversation with me he seemed to be chiefly interested in perfecting his clock.

Q. 21. Do you know a man by the name of Hieronymus Geistwite, and did he ever work for you?

Ans. I did know him, and he worked for me.

Q. 22. He was called as a witness for the defendant's in this case, and testified, on page 478, that he worked as mill-wright for Mr. Mosser, at the mill just across the creek in York county, opposite New Cumberland; was that one of your mills at that time?

Ans. Yes, sir; I had it leased.

Q. 23. Did he ever work for you, and was he a mill-wright?

Ans. He worked for me, but I never knew him as a mill-wright.

Q. 24. He testifies that he began to work for you in July, 1870, repairing or re-building the mill. Did you put in new saws or repair the mill in 1870?

Ans. No, sir; I have no recollection of any repairs that year.

Q. 25. Is there any circumstance which satisfies you that you didn't overhaul the mill that year?

Ans. Yes, sir.

Q. 26. If you have your time book here for the years 1869, 1870, 1871, and part of 1872, will you please point out where his name first appears as having done work for you?

Ans. On the 26th day of June, 1871.

Q. 27. I notice, also, that that page contains the names of fifteen or twenty workmen, and that his is the last on the list; does that indicate that he was a new hand?

Ans. I think it does.

Q. 28. I see his name is there written "R. Geistwite;" what was he commonly called?

Ans. Ronny Geistwite.

Q. 29. Will you look at that time-book and at your ledgers, at the accounts headed with his name, and tell me how long your books show that he continued to work for you, or at your mill?

Ans. From June, 1871, to July 31, 1874, and he may have worked longer than that on the mill, after this period, for Hull & Dugan, who were running the mill by the thousand; it is quite likely that he worked for them.

Q. 30. I observe that the last page of your account, page 134 of the ledger, shows that the last work he did for you was some work in April, 1874, and a few half days in July, 1874, and that Hull & Dugan's name then appears in his account; was that about the time his work was charged to them?

Ans. Yes, sir.

Q. 31. I observe, that according to the ledger, page 63 for example, he appears to have worked for you, either by day work or job work, pretty full time through 1872; was that the fact?

Ans. Yes, sir; and to the close of February, 1873.

Cross-examined by Mr. Hill:

Cross-Q. 32. You speak of the mill as one which you leased; when did you first lease that mill?

Ans. My father leased it in 1848, and I had been associated ever since. I renewed my lease in 1871. The mill was re-built in 1857, on the old site. The renewed lease was from the 1st of April, 1871.

Cross-Q. 33. Did you repair the mill in 1871?

Ans. I did.

Cross-Q. 34. And according to your books, Geistwite commenced to work for you in the latter part of June, 1871, and worked pretty steadily right along for about a year and a half or a little more; is that a fact?

Ans. That is so.

Cross-Q. 35. And he did some work for you, from time to time, afterwards, for a year or so?

Ans. Yes, sir.

Cross-Q. 36. Did he assist in repairing the mill?

Ans. I think he did.

Cross-Q. 37. He is dead now, I understand. Do you know that fact?

Ans. He was in our employ, and died in our house.

Cross-Q. 38. When you went up to see Mr. Drawbaugh on business, and had the conversation about the clocks, how did that conversation come about. Did you tell him that you wanted to write up the subject in the newspapers, or that you felt an interest in the clock invention, and did the conversation commence in some such way as that?

Ans. I don't think I mentioned the writing of the letter to the newspapers. My recollection is, that that was an afterthought after I went home. I saw the clocks there, and heard of them, and was very much interested in his explanation of them, showing their properties. My desire was to attract public attention to the invention, that Mr. Drawbaugh might be benefited.

Cross Q. 39. Mr. Drawbaugh was indebted to you at that time, was he not?

Ans. Not to me personally.

Cross-Q. 40. Was not your business, that took you to his shop, the collection of a bill from him?

Ans. It was. I had been appointed attorney-in-fact for Lee & Bayler. The account was theirs.

Cross-Q. 41. Did you make the collection at that time?

Ans. I did not.

Cross-Q. 42. How long were you there at the shop at that visit?

Ans. Possibly an hour. I could not tell positively. I was not as busy then as I am now.

Cross-Q. 43. Was anybody present with you and Drawbaugh during any part of the conversation?

Ans. My little son and daughter were with me. I don't think anybody else was present.

Cross-Q. 44. When you went into the shop, did you find Drawbaugh at work at anything. If so, what?

Ans. My recollection is that he was busy. I could not say at what.

Cross-Q. 45. Did he say anything about having in prospect an arrangement with Shettel and the Grissinger's for the manufacture of the clocks?

Ans. I don't remember the names. He did say that he had in prospect an arrangement with parties who would manufacture the clocks. I think the party he named was Shapley, of Mechanicsburg.

Cross-Q. 46. Did he talk to you about any other of his inventions except the clock and the telephone?

Ans. I think I asked him about a barometer that I had heard he had invented.

Cross-Q. 47. Anything else that you remember as to inventions?

Ans. I do not.

Cross-Q. 48. Do you remember whether he began the conversation about clocks, or whether you did?

Ans. I think it is very likely I did, seeing them there.

Cross-Q. 49. But he began the conversation on telephones, did he?

Ans. That I cannot say. I think that is likely.

Cross-Q. 50. Which part of the conversation came first. That on telephones or that on clocks?

Ans. I cannot say. I think on clocks.

Cros-Q. 51. Was the barometer conversaton after the talk on telephones?

Ans. I think it was.

Cross-Q. 52. Did he show you the barometer?

Ans. I don't think he did. I think it was out of order, or he did not have one there. I had been told that he had invented a barometer, and asked him about it.

Cross-Q. 53. The conversation on telephones, I suppose, was very brief, was it not?

Ans. It was.

Cross Q. 54. But you had a full conversation on clocks, and he explained them to you fully, did he?

Ans. Yes, sir; pretty fully, I think.

Cross-Q. 55. Did he have a large, handsomely made, and attractive looking clock in the shop there?

Ans. Not completed, I think, at that time.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this fourteenth day of July, 1882.
FRED. M. OTT, *Examiner.*

HENRY R. MOSSER.

SADE R. WEAVER being produced, affirmed and examined, saith:

Examined by Mr. Storrow:

My residence is Harrisburg, Pa. Occupation, clerking.

Q. 1. You were requested to search the following papers: *Harrisburg Independent*, *Harrisburg Patriot*, and the *Harrisburg Telegraph*, daily editions, for the years 1877, 1878, and 1879, and to find and copy therefrom everything which named or referred to Daniel Drawbaugh. Did you search those papers carefully for that purpose?

Ans. Yes, sir.

Q. 2. Will you tell me the dates of the papers in which you found anything relating to him, and produce copies of all the articles in all those papers during that period which mentioned him?

Ans.	Feb. 1, 1878,	Harrisburg	Telegraph.
	" 13, 1878,	"	"
	April 18, 1878,	"	"
	May 7, 1878,	"	Patriot.
	" 9, 1878,	"	Independent.
	" 14, 1878,	"	Patriot.
	" 15, 1878,	"	Independent.
	" 17, 1878,	"	"
	Dec. 28, 1878,	"	Patriot.

(Witness produces copies of the foregoing articles, to be marked "Complainant's Exhibit, Drawbaugh Harrisburg Newspaper Articles.")

[*Said copies severally objected to by Mr. Hill, as immaterial and not rebutting.*]

Q. 3. Did you also find in, and copy from said papers certain articles relating to the introduction and use of electric speaking telephones in Harrisburg and elsewhere. And if you have copied some of them, which I designated to you, will you please produce the copies, and state the papers from which you copied them?

Ans. I produce them. They are from the following papers:

Harrisburg	Patriot,	Feb. 26, 1877.
"	Independent,	Sept. 20, 1877.
"	Telegraph,	" 28, 1877.
"	"	Oct. 10, 1877.
"	Independent,	Nov. 12, 1877.
"	Telegraph,	Dec. 19, 1877.
"	Independent,	Mch. 14, 1878.
"	Telegraph,	" 16, 1878.

Harrisburg	Patriot,	Mch. 18, 1778.
"	Telegraph,	" 29, 1878.
"	Patriot,	May 4, 1878.
"	Telegraph,	" 11, 1878.
"	"	" 21, 1878.
"	Independent,	June 11, 1878.
"	Patriot,	" 14, 1878.
"	Independent,	Oct. 1, 1878.
"	Telegraph,	" 1, 1878.
"	Independent,	Dec. 3, 1878.
"	Telegraph,	Apr. 29, 1879.
"	Patriot,	Oct. 22, 1879.
"	Telegraph,	Dec. 19, 1879.

(Said copies are put in evidence, to be marked "Complainant's Exhibit, Harrisburg Newspaper Telephone articles.")

[*Said copies severally objected to by Mr. Hill, as immaterial and not rebutting.*

Q. 4. You also found in those newspapers certain articles relating to Edison's phonograph, which I asked you to copy. Will you please produce such copies, and state the newspapers from which they are taken?

Ans.

Harrisburg	Patriot,	June 17, 1878.
"	"	" 18, 1878.
"	"	" 21, 1878.
"	"	" 26, 1878.
"	"	Jan. 16, 1879.
"	"	" 20, 1879.
"	Telegraph,	June 19, 1878.
"	"	" 24, 1878.

(Said copies are put in evidence, to be marked "Harrisburg Newspaper Phonograph articles.")

[*Said copies severally objected to by Mr. Hill, as immaterial, irrelevant, and not rebutting.*]

Cross-examination waived by Mr. Hill.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 14th day of July, 1882.
FRED. M. OTT, *Examiner.*

SADE R. WEAVER.

ELIZABETH R. WEAVER being produced, affirmed, and examined, saith:

Examined by Mr. Storrow:

Q. 1. Where do you live, and are you a sister of the last witness?

Ans. I live at 222 Boas st., Harrisburg, and am a sister of the last witness.

Q. 2. I asked you to search carefully the following daily newspapers: *Harrisburg Patriot* for the years 1874, 1875, and 1876; the *Harrisburg Telegraph* for the years 1874, 1875, and 1876, and the *Harrisburg Independent* from the time it began, which was in 1876, to the end of 1876, and to note if you could find therein any reference to Mr. Daniel Drawbaugh, or any reference to any magnetic clock. Did you make that search?

Ans. Yes, sir.

Q. 3. Did you find in either of those papers, during any of those years, any reference to Mr. Daniel Drawbaugh, or to a magnetic clock?

Ans. I found no reference.

Q. 4. I also requested you to search carefully a newspaper called the *Baltimore American*, published at Baltimore, Md., for the years 1875, 1876, 1877, and 1878, and to note and copy all the articles found therein, which related to Daniel Drawbaugh. Did you make such search, and will you produce copies of all such articles, and state date of the papers in which you found them?

Ans. February 2, 1878.
May 18, 1878.
November 28, 1878.

I produce the copies.

(Said copies are put in evidence, and are marked "Drawbaugh's Baltimore American Articles.")

[*Said copies are severally objected to by Mr. Hill, as immaterial and not rebutting.*]

Q. 5. I also asked you to copy from the *Baltimore American* certain articles which I designated, relating to telephones; will you please produce those copies and mention the newspapers from which you copied them?

Ans. Baltimore American, July 22, 1876.
" " August 18, 1876.
" " November 30, 1876.
" " December 3, 1877.

I produce the copies.

(Copies put in evidence, and marked "Baltimore American Telephone Articles.")

[*Said copies severally objected to by Mr. Hill, as immaterial and not rebutting.*]

Cross-examination waived by Mr. Hill:

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me this 14th day of July, 1882.
FRED. M. OTT, *Examiner.*

ELIZABETH R. WEAVER.

Adjourned until July 15, 1882, at 10, A. M.

JULY 15, 1882, 10 A. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

THEOPHILUS WEAVER being produced, sworn, and examined, saith:

Examined by Mr Storrow:

My age is nearly forty-nine; residence, Harrisburg, Penn'a; occupation, solicitor of patents, pattern-maker, builder of experimental machinery, manufacturer, &c.

Q. 1. When did you begin to live in Harrisburg, and what was your occupation when you first lived here?

Ans. I began to live in Harrisburg in 1864. I then became principal of the boys' high school, in the south end of Harrisburg, about the 15th of February.

Q. 2. Had you been a school teacher before that?

Ans. Yes, sir.

Q. 3. How long did you teach the boys' high school?

Ans. Between two and three years.

Q. 4. While you taught that school, here in Harrisburg, did you become interested in inventions and patents; and if so, how at first?

Ans. I did I became inventor and patentee of school desks in 1864; I took out two patents then, about November.

Q. 5. Have you since then made any inventions yourself on which you have taken out patents; and if so, how many?

HONE COMPANY,-3

Ans. I have; I have taken out twelve or more patents of my own, running through a series of years.

Q. 6. Did you in those cases draw your own specifications and claims, and did you prosecute your cases yourself or employ a solicitor?

Ans. In my first two patents on school furniture, I drew up my own specifications, and prosecuted those cases without an attorney; one Robert Hudson having made the drawings for me. Soon after, in other applications of my own invention, I made the drawings and drew the specifications myself, and prosecuted the applications without any assistance. In several applications I did have assistance, after the applications were made, once employing D. P. Holloway, Mason & Co.

Q. 7. When did you begin to act as solicitor of patents for other people?

Ans. As early as 1868, having then made an application for William A. Middleton and John A. Haller, on a horse-hitch.

Q. 8. Did you at any time become interested in an eraser invention by Mr. William P. Patton, of Harrisburg; and if so, when was it?

Ans. I did; in 1866 Mr. Isaac Lloyd, of Harrisburg, and myself, bought the entire patent of William P. Patton, on an eraser-holder for use on lead-pencils.

Q. 9. When did you become personally acquainted with Mr. Daniel Drawbaugh, of Eberly's Mills, and who mentioned him to you, and in what connection?

Ans. At the time of purchasing the eraser-holder, Mr. William P. Patton directed our attention to Daniel Drawbaugh, of Eberly's Mills, as a person who was likely to make us a good machine, or tool for making the eraser-holders, stating that Mr. Drawbaugh had made a stamping machine to make a certain discous-headed carpet tack of Mr. Patton's invention a few years before, which machine, he said, was a curious and wonderful novelty of its kind. And he thought Mr. Drawbaugh could get us up a very superior machine for our purpose.

Q. 10. Were your eraser-holders made out of stamped metal?

Ans. Yes, sir; they were to be of stamped metal.

Q. 11. Now you may go on and state whether you saw Mr. Drawbaugh in that connection, and if so, what year it was in?

Ans. This prompted me to go and see Mr. Drawbaugh sometime in the next spring—the spring of 1867.

Q. 12. Where did you see him?

Ans. I saw him at Eberly's Mills.

AMERICAN BELL TELEPHON

Q. 13. Did you see him in his shop, or where?

Ans. I saw him in his shop, and also at the fore-bay of Eberly's grist-mill.

Q. 14. How near was his shop to the grist-mill?

Ans. It was only about a stone's throw off.

Q. 15. Did you talk to him about the construction of a stamping machine for your eraser-holder?

[*This question, and all other questions relating to the construction of this machine objected to, as immaterial, irrelevant, and not rebutting.*]

Ans. I did.

Q. 16. Did you then contract with him to build it, or what was it understood he was to do about it?

[*Same objection.*]

Ans. He was to make an estimate of the cost of building a machine or tool for said purpose, and also show a plan of the machine, which he agreed to do. He spoke of his ability to get up such a machine, talked wisely on the subject, and spoke of manufacturing the article advantageously on a large scale. And that it would be best to get up a machine that would turn the work out rapidly, and agreed to report soon.

Q. 17. You say he spoke of his ability to get up a machine. Did he, or did he not, tell you that he could construct it in addition to designing it?

[*Same objection.*]

Ans. He did say so affirmatively.

Q. 18. Did you see him at Eberly's Mills again during that year—1867?

Ans. I did, later in the year—sometime after August.

Q. 19. Had he then moved to the lower shop, where they made faucets, or not?

Ans. He still worked at the same place. I think it was in the basement of his dwelling-house.

Q. 20. Did he finally construct the stamping machine for you, and if not, why not?

[*Same objection.*]

Ans. He did not. We waited some months to get his plans and estimate, and to come to an understanding. And we got tired waiting on him, and I commenced work about that time myself, and got up a design for the machine, and went to work to build it at Boyer's works, a new enterprise just started up on Fourth street, Harrisburg. The machine, when made, did not answer the purpose perfectly, and Mr. Drawbaugh happened to come into the shop about the time we had given the machine a trial. He said he could make the machine work, but he would have to get up a set of new dies, and also spoke of changes in the feed, to make the working slower. And, in consequence, I visited his shop the second time, as already stated.

Q. 21. At these visits to Mr. Drawbaugh's shop, in 1867, did he show you any devices or contrivances which he was experimenting on or working at. And if so, will you please mention some of them?

Ans. He did. I think I met him at the first visit at the fore-bay of Eberly's grist-mill, where he was experimenting at that time with his rotary measuring faucet applied, or used, as a force pump, having hose attached to it, by which he drew water out of the fore-bay, and forced it out through a hose on which I stood, to test the force of the pump. In the shop, in the basement of his house, at the northeast end, he showed me a miniature steam engine, which he said he had built when a boy. It had been used, he said, in running a grind-stone. On the long south-east side of the shop was a wood-turning lathe, and, if I mistake not, a machine for turning iron, partly of his design, and a work-bench, on which were some wooden patterns of his rotary faucet. At the south-west end of the shop, which was better lighted than some other parts of the shop, there were displayed some tools of his own make, he said. Among others, some remarkable long, heavy, round, and square files, which he said he had cut himself. On the said long side of the shop wall, I think, were displayed some drawings of landscape scenery, which he said he had executed.

Q. 22. Did he explain to you, as well as show you, the various contrivances you have mentioned?

[*Objected to by Mr. Hill as immaterial.*]

Ans. He did; he seemed to take pleasure in showing those devices, and I was much interested, and was impressed that he was a man who was fertile in expedients or invention.

Q. 23. Did you get the impression at the time from what he said and did, that he showed you everything he had worth showing?

[*Objected to by Mr. Hill as incompetent and mere opinion.*]

Ans. I did.

Q. 24. From the time you first knew him, in 1867, have you been in the habit of meeting him frequently?

Ans. I have met him frequently. I believe once, or oftener every year, from then on to the present time. Sometimes quite frequently.

Q. 25. Has he been to your office between 1867 and 1877, and if so, has it been only once or twice, or frequently?

Ans. He has often called at my office between the years 1867 and 1877. He would most always, if he was in the lower end of the city, call in, and we would have a friendly talk, and sometimes confer on inventions, and sometimes refer to the inventions of others.

Q. 26. On page 991 of the defendant's record, Mr. Drawbaugh, referring to you, testified: "I often asked him to make search for me on different inventions, but I don't now remember what." Is that the fact, according to your recollection?

Ans. It is.

Q. 27. Did you have at your office a set of the Patent Office publications?

Ans. I did have the patent office reports running from 1853 up to the year 1877, including the Official Gazette.

Q. 28. If you remember any particular occasions of meeting him during those years, please name some of them?

Ans. I fix the occasions mostly by my own employments and work on my own inventions, and in some cases by the inventions of others. In 1868 I was engaged in experimenting on hand corn-shellers, and had occasion to pass frequently up to W. O. Hickok's foundry. In going there and returning I sometimes went up Short street, or came down that way, and passed William Jenning's and David Stevenson's machine works, where Drawbaugh's rotary pump was at that time being made, in the early part of 1868. I recollect meeting Daniel Drawbaugh at that work, then. I had been in the works and had seen work being done by the machinists on the rotary pumps; the work was irregular in form, and could not all be made by the lathe, part of the turning had to be done by hand devices, and the case of the pump being oval, required repeated turning to clean the inside. After seeing the work, I spoke to Mr. Drawbaugh, on that occasion, on the nature of the work and the difficulty, and the necessity of simplifying it; he said he was getting up some tools by which it could be readily performed. He appeared to be very confident of overcoming all difficulties, and I didn't venture to make any suggestions to him further than to allude to the necessity, as stated; he had a reputation as a machinist, that very few men would venture to offer advice to him.

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Q. 29. Do you remember any other particular occasion of meeting him in 1868; and if so, state where it was, and in what part of the year, and what he was doing?

Ans. I do remember meeting him at the State fair, held about the last of September and beginning of October, 1868. He was at that fair exhibiting his nail machine and rotary pumps, and I was also there exhibiting by a substitute. Mr. Drawbaugh, during that fair-week, in a conversation, wanted to illustrate something by making a sketch; I don't remember what it was, but I remember that in trying to get the pencil out of his pocket—inside pocket of his coat—he had to get out first a roll of money—bank-bills—the roll being about two or three inches in diameter. I was amazed to see a man carry that amount of money in such a way, at such a place; that is mainly what impressed that interview.

[Recess for dinner, until 2, P. M.]

JULY 15, 1882, 2, P. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Q. 30. If you met him the next year, 1869, at the State fair, state what you were doing there, and what he was doing there?

Ans. I met him at the State fair of 1869, at about the same time of year, about the latter part of September and beginning of October; he was exhibiting his rotary faucet and rotary pump, or was by them, and I was exhibiting at that fair my off-hand sheller and my geared corn-sheller. We had interviews at that fair, but I can't remember the substance of any of them, only remembering that he had illustrated circulars, and was apparently prosperous with his inventions.

Q. 31. Have you recently refreshed your memory as to the fact of his exhibitions at these fairs, and as to their date; and if so, how?

Ans. I have; I consulted the files of the Harrisburg Patriot for the year 1868, and found that the State fair was held for that year from September 28 to October 2, and that the issue of the paper for October 4, contained the official report, in which appeared the mention of Daniel Drawbaugh's nail machine and rotary pump. I also consulted the files of the Harrisburg Daily Telegragh for the year 1869, and found that the State fair was held, likewise, the last week in September and first few days of October; also, that Daniel Drawbaugh was mentioned in connection with his rotary faucet and pumps exhibited at that fair, and that my inventions were also mentioned and commented on.

Q. 32. Were your two corn-shellers patented by you, and if so, when?

Ans. They were. My first corn-sheller patent is dated July 6, 1869. The other is dated August, some day—I don't remember the day exactly—1869.

Q. 33. Do you remember any particular and distinct occasion when he came to your office, in 1870?

Ans. Yes, sir; I do. It was sometime in the spring of 1870, when I was manufacturing a lot of my hand corn-shellers, which I generally put together and finished in one part of the room in which my office is. I remember him remarking favorably on the finish of my corn-shellers, and he asked me where I got the castings. I told him they were made at Reading, Penna., at the hardware works, but that I had made the patterns. Also, that they were japanned in Reading. I thought he seemed reticent on that occasion. I thought my work had somewhat surpassed the finish of some of the castings that he had got at different places. In getting my first castings on the corn-shellers, I had got them at Mount Joy, for the shellers which I had exhibited at the State fair the year previous. While at Mount Joy, I saw some of his patterns there on faucets. This reminds me that I had a conversation, sometime before that, with him, regarding those patterns, because they required to be drawn squarely out of the sand. and I had spoken to him something about the draft of those patterns. I also had a conversation with J. W. Moffitt about that time, in which he represented that Daniel Drawbaugh was the original inventor of what is known as the Giffard injector for steam engines. I am impressed that in that interview in 1869, I asked Mr. Drawbaugh personally whether he had any hand in the invention spoken of. He left me under the impression that he had invented the same thing, in substance, before Giffard did. This opened my mind to study Mr. Drawbaugh carefully, either as an inventor of greater claim than I supposed he was, or that he was in the habit of talking in a visionary manner—that is, imagining that he was an inventor, when, perhaps, he was not really that character.

[*Mr. Hill objects to the facts stated in the above answer, as utterly immaterial and irrelevant, and not rebutting, and objects to the inferences, suppositions, and opinions expressed as immaterial and incompetent.*]

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Q. 34. Did you have any knowledge that he had done anything about injectors except the verbal assertions he had made?

[*This whole line of examination objected to by Mr. Hill, as frivolous and immaterial, and mere waste of time.*]

Ans. I did not. except what Mr. Moffitt had stated.

Q. 35. State whether in 1871 there was any interview or matter passing between you and Mr. Drawbaugh, that you specifically remember?

Ans. I remember having interviews with Mr. Daniel Drawbaugh some time after August of that year, in which I consulted him or asked his opinion on the merits of my spherical gears, on which I had obtained a patent that year. Those gears were peculiar, and I was in the habit of consulting different machinists. I remember Mr. Drawbaugh took some interest in the gears, but said they would wear pretty rapidly. I remember this, because I afterwards studied to overcome the friction, and was governed somewhat by his opinion.

Q. 36. Were the Reading hardware works celebrated for the fine quality of their small castings?

[*Objected to by Mr. Hill, as the witness is not shown to be in a position to know the general reputation of their work, and further, as immaterial and irrelevant.*]

Ans. I know personally that they were. I was through their works several times several years before. I was personally acquainted with William Harbster, of the firm of Harbster Bros., who showed me the wares they were making; also, their styles of japanning; also, various articles they were manufacturing, and I had learned by inquiry that hardware men considered their wares of first-class finish.

Q. 37. How did you come in contact with Dr. Moffitt, in 1868 and 1869, and was it Dr. J. W. Moffitt, the dentist, of Harrisburg?

[*Objected to by Mr. Hill as immaterial.*]

Ans. The individual referred to was Dr. J. W. Moffitt, the dentist, of Harrisburg. I first did some work for said Moffitt, in the fall of 1867, on a reservoir soldering iron, but I am impressed that Mr. Drawbaugh made a wooden pattern for casting the body of the iron. I am not positive. Then, in 1868, I took out a patent for Dr. Moffitt on sash locks, and was engaged by him in working the lock up as an article for the trade. Certain defects appearing, owing to difficulty in casting it, he induced me to re-model it or make a new lock, on which he was willing to take out a patent, and did so the same year, in my name. Then, and for some time thereafter, I made different locks and hardware patterns for him on said lock, which was varied in sizes and styles: window-lock, a cupboard-lock, and common door-lock. I assigned said patent to Dr. Moffitt.

Q. 38. Was that 1868 patent taken out on an invention made by Dr. Moffitt, or on one that he bought?

[*Same objection.*]

Ans. The 1868 patent was taken out on the invention he bought from me for a few dollars. I sold it low, because I was in his employ.

Q. 39. Do you mean that you only took out one patent for him, and that that was on your own invention, or that you took out two for him?

[*Same objection.*]

Ans. I mean that I took out only one patent for Moffitt in person that year, but I did take out other patents in other years for him.

Q. 40. Did he already have a lock patent before you took out that one on your own invention?

[*Same objection.*]

Ans. Yes, sir.

Q. 41. Was that taken out on his own invention, or had he bought it?

[*Same objection.*]

Ans. It was taken out on his own invention in sash locks.

Q. 42. Did you before the end of 1877 take out any other patents for him?

[*Same objection.*]

Ans. Yes, sir.

Q. 43. What others?

[*Same objection.*]

Ans. I took out two patents for him on bra shoes for cars.

Q. 44. Were those on his own inventions, or on inventions which he purchased, and when were they taken out?

[*Same objection.*]

Ans. Those patents were both taken out on his own inventions; they were probably taken out in 1872 and 1873. I cannot answer that question definitely, without referring to the Patent Office reports. I am impressed that it was in 1873.

Q. 45. Do you remember any particular occasion in 1872, when any special matters passed between you and Mr. Drawbaugh?

Ans. Yes, sir; I remember consulting him in 1872, in regard to a rotary steam engine, the invention of John Blankinhorn. I was at that time—about the month of June, 1872—employed by Mr. Blankinhorn to take out a patent on his oscillatory engine, if I should find it patentable. I was searching the Patent Office reports, when Mr. Drawbaugh came into my place of business. I was very glad he did so, and I stated the matter to him—that I had an examination to make—and stated the nature of it. I was unreserved in stating this matter, and departed from my general rule of secrecy in making applications for patents, because Mr. Blankinhorn had already constructed a life size engine, and had it in operation at the machine shop of the Canal Company, at the Pennsylvania canal, near State street, Harrisburg. Mr. Drawbaugh stated that he had experimented on an oscillatory steam engine several years before that, and he would take pleasure in seeing the engine. We next went up town together and visited the shop, and saw the engine, but it was not in operation that day. However, Mr. Blankinhorn took us into a wood-shop, where he had the patterns of the engine, which he showed us, and explained the principles of the construction of the engine. Mr. Drawbaugh remarked that he did not think it was new in its main features. Some parts, he said, were different from anything he had seen, but he thought, if he would look over the *Scientific American*, he could find an engine illustrated, which was very much like Mr. Blankinhorn's engine. That is all I can remember of that interview.

[*Answer objected to by Mr. Hill, as totally irrelevant and immaterial.*]

I ought to have stated that he promised to send me the cut, if he could find it.

Q. 46. Did he afterwards send you the cut; and if so, how did he send it?

[*Same objection.*]

Ans. Yes, sir; he sent me the cut, inclosed in a letter, soon after. It illustrated Runkle's oscillating engine, and had appeared in the *Scientific American* a few years before. I have the letter yet, but it appears that I returned him the cut sometime in 1873. I infer this from a note which I made on the envelope containing the letter.

Q. 47. Please produce that envelope and letter, and state whether they are in the handwriting of Drawbaugh, and read them, that they may be made a part of your answer.

[*Same objection.*]

Ans. This is Daniel Drawbaugh's handwriting. The letter reads as follows:

"EBERLY'S MILLS, PENNSYLVANIA, July 25, 1872.

r. THO. WEEVER:

Dear Sir:

Enclosed find engraving of Runkel's oscillating piston Engine, which I promest to send you, and had intended sending along with this a drawing of a cylinder oscillating engine which I was working some years ago, but could not find. it is laying among some old papers, so that it would take some to look it up, but will look for it hereafter.

Yours, respectfully,

DANL. DRAWBAUGH."

The envelope is addressed as follows:

"Mr. Theophilus Weaver,
Harrisburg,
Pa."

Post-mark:
"Eberly's Mills,
July 25. Pa.,
72."

In pencil:
"Returned copy,
Jan. 1, 1873."

Q. 48. In whose handwriting is the penciled memorandum on it, and what does it mean?

[*Same objection.*]

Ans. The memorandum is in my handwriting. The word "copy," I think, means the cut referred to, illustrating Runkle's engine.

Q. 49. Did you see Mr. Drawbaugh at his shop, at Eberly's Mills, at any time in 1873?

Ans. Yes, sir; during that spring I was still working on hardware pattern-making for H. C. Demming, of Harrisburg. I had done a good deal of work for him the previous year or two, in working up the Reisinger sash-lock. Mr. Isaac Lloyd, of Harrisburg, had electro-plated a good many gross of said sash-locks. Mr. Lloyd and I had frequent interviews, and he sometimes talked about a magnetic clock that he had seen at Daniel Drawbaugh's shop. I had my curiosity excited, in this way, to visit Mr. Drawbaugh's shop some time that year, and I went over and saw him and his clock.

Q. 50. Tell me what you saw at that shop, at that time?

Ans. I saw the magnetic clock, mounted on a board, which was placed against a partition, in a little room in the northeast corner of the shop now occupied by Chellis and Drawbaugh. The clock had no face on. The works were naked, and all exposed to view. It was, or claimed to be, worked by magnets—one a permanent magnet, and the other an electro-magnet. Two wires led from the clock, and were said to communicate with plates in the ground. Down stairs, I believe, I saw his nail machine, having specimens of nails on it or near it, which Mr. Drawbaugh said had been cut on the machine. There were other machines in that room down stairs. I don't recollect that my attention was particularly directed to them, as they were idle and out of use at that time. That is all that I can recollect, I believe.

Q. 51. Did Mr. Drawbaugh take you down stairs to see the nail machine, or how did you happen to go to see it?

Ans. He did; he took me down; he showed me all that I have mentioned.

Q. 52. If you remember any specific and particular occasion when he came to your office in 1874, please state what it was?

Ans. In 1874 I was experimenting on car-couplers, and I believe it was that year—I am almost positive, in August, 1874—that Mr. Drawbaugh and Wilson Bear called at my office, and, among other things, we talked car-coupler. I showed him and Bear my devices, and in the conversation, Mr. Drawbaugh remarked, that he had experimented on couplers, too, at one time. He said he had invented a coupler in which he employed a ball on which to support the coupling-pin, and the entering link would displace the ball, and leave the pin drop through the link. I remarked, that that was not a new device; it was very old, but a very good one, and I got down the Patent Office report of 1855 and showed him an illustration of England's coupler, which showed precisely that kind of a coupler. Mr. Drawbaugh examined it, but didn't manifest very much surprise over it—didn't appear to be concerned in that way.

[*Answer objected to by Mr. Hill, as immaterial and irrelevant.*]

Q. 53. If you had any business in 1875 which brought you in contact with Mr. Drawbaugh, will you please state what it was?

Ans. In 1875 I was employed as counsel in an interference case on Jacob Kline's patent, more particularly on Kline's patents on harvester crank-pin, which I had re issued, as attorney of record, that spring. After the re-issue of said patent, the Domestic Sewing Machine Company sought to re-issue, with broad claim, a sewing-machine journal of one Wild, of Baltimore, Md. I frequently met Mr. Drawbaugh, pending that suit of interference, and while taking out other patents for Jacob Kline. The Kline Axle Company was then doing business at Eberly's Mills, at Drawbaugh's shop. I was there at that shop when Drawbaugh was at work getting up special tools for manufacturing the axles and sewing-machine journals under the Kline patents. I saw Mr. Drawbaugh sometimes at M. M. Grove's office on Walnut street, Harrisburg, who was the manager of the company at that time. I think it was at Grove's office that I saw him when he first made a reaming tool for reaming out the eye of the balance-wheels of sewing machines.

During the taking of the testimony in the interference suit, Kline *vs.* Domestic Sewing Machine Company, sewing-machine journal, Mr. Drawbaugh was one of the witnesses. He had prepared for Mr. Kline certain scaled drawings on sewing-machine journals and pitman attachments, to represent certain models.

[*Answer objected to by Mr. Hill, as immaterial and irrelevant.*]

Adjourned until 10, A. M., July 17, 1882.

MONDAY, July 17, 1882, 10, A. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Examination of Theophilus Weaver, by Mr. Storrow, continued.

Q. 54. Can you give me the dates of the Kline patents?

Ans. Yes, sir; I find, by reference to the official reports, they are as follows: Harvester-crank and pin, March 22d, 1870, No. 101,134; harvester, May 10th, 1870, No. 102,835; harvester-crank and pin, No. 101,134, re-issued June 15th, 1875, as No. ————; carriage axle, April 6th, 1875, No. 161,518; sewing-machine journal, June 6th, 1876, No. 178,303.

Q. 55. Did you take out all those patents, and were they the patents under which the axle company worked?

Ans. I took out all those patents. The company worked on all those patents, except the one named "Harvester," May 10, 1870, and the last-named patent.

Q. 56. Have you looked up the dates of the patents you took out for Dr. Moffitt. If so, please state them?

Ans. Yes, sir; I also examined the official reports, and find the record as follows:

Sash-lock, Feb. 16, 1869, No. 86,936.

Brake-shoe, May 6, 1873, No. 138,514.

Construction of car-brakes, Feb. 24, 1874, No. 147,856.

Q. 57. You spoke of some work you did in connection with car-couplers. If you have any memorandum by which you fix that date, please state what it is.

Ans. In looking over old bills filed away, I find one dated July 18, 1874, of work done for me by W. O. Hickok. The item in the bill is "hinged irons." I know that work was done for me, on the car-coupler referred to.

Q. 58. If you have any official letter from the Patent Office, which names the date of your application on car-couplings, please produce it, and state what that date is.

Ans. I have an official letter, which states that my application on car-coupling referred to was filed August 25, 1874.

Q. 59. Please state whether, in 1876, you had any particular occasion to go to Mr. Drawbaugh's shop, and if so, when was it, and for what purpose?

Ans. Yes, sir; I went to Mr. Drawbaugh's shop about the beginning of March, 1876, with members of the Kline Axle Co., to take an inventory of their machinery and stock on hand, with a view to run the work myself, under a lease from them, and to manufacture their axles and sewing-machine journals on a royalty.

Q. 60. Did you go there more than once with reference to taking that inventory, about that time?

Ans. Yes, sir; I went there first to make a rough estimate, and then spent about two days afterwards in making a true inventory, writing down everything in an itemized statement.

Q. 61. If you have that inventory you will please produce it, and state what date it bears.

Ans. I have it here. It is dated March 2d, 1876. This, I think, was a copy of the inventory taken on the first and second days of March, 1876, in pencil-writing, and I copied it in the evening of the second of March, 1876, and the following day.

Q. 62. Is this all in your handwriting?

Ans. It is.

Q. 63. I notice that there is annexed to it a paper, in pencil, dated "Harrisburg, Feb. 29, 1876," and headed "Inventory of goods at M. M. Grove's." What was that?

Ans. That part of the inventory was taken on the day stated, before we went over to the Axle Company's works. The company had some goods and a few tools at M. M. Grove's office, who was the acting manager of the company.

Q. 64. Did you carry out the expected arrangement with the company for which that inventory was taken, or did the negotiations fall through?

Ans. The negotiations fell through, and the work was not carried on by me.

Q. 65. On either of those visits about the inventory, did you go out from Harrisburg alone to Mr. Drawbaugh's shop, and arrive there before the members of the company?

Ans. On the first morning; that is, of the day on which we took the rough estimate, I am impressed I went over on the train to White Hill station, and went from there alone to the company's workshop. When I arrived there, I found only Wilson Bear of the company on hand, the other members not having arrived yet.

Q. 66. Did you wait long for the other members, and what did you do while waiting?

Ans. It was quite awhile before Captain Moore and Mr. Grove arrived. Meanwhile, we found Mr. Daniel Drawbaugh in a room upstairs, and went into his place where he was working, or about beginning work, on brass work lying on his bench, which he stated he had got cast at Hickok's, at Harrisburg, for some party whose name I do not now recollect, remembering only that Mr. Drawbaugh explained to us a certain difficulty which had before existed in casting a large bulb on that work, in which a core had to be suspended in a peculiar manner. Mr. Drawbaugh left his work, and waited on us, showing us various articles of

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interest which he had constructed and invented. I remember his showing us an electric fire-alarm. Having placed certain parts near the stove, and shown us that when certain wooden parts became heated by the stove, which was then hot, a bell would be caused to ring automatically by the apparatus. He also showed us what he termed a "dial telegraph," an instrument which he had in an upper part of a cupboard or closet, in the north-east corner of the room. He explained its operations. This did not appear to me the first time that I had seen it, yet in giving my testimony the other day, stating that I had been in his place in 1875, I cannot clearly re-call that I really was in his place in 1875. I also remember that when I was in the work in 1875, if I was there, Mr. Herman K. Drawbaugh was at work on axles. My impression is I must have seen the dial telegraph in 1875. Mr. Drawbaugh also took us into the adjoining small room, and showed us his magnetic clock. This, too, had not that novelty which it had when I saw it on a former occasion, but was still in operation, and apparently in good condition. I remember quite well that Mr. Drawbaugh spoke favorably of it as a time keeper; that it had run for a long time without gaining or losing much, but had varied somewhat. I think he also spoke of making certain improvements on it, by which he could regulate the variations. I remember nothing further of his novelties, except a needle for sewing carpet rags, by which the ends of rags could be joined without needle and thread. I recollect, however, he was building a new lathe for himself at that time, and had it almost completed. He stated he was about going to do business in Mechanicsburg, and was fitting up tools to do model work there and work of that class. I think I remember also seeing a small tool or machine for stamping tin plates for some purpose or other, which he had constructed. That is all I can remember of his things.

Q. 67. It has been testified, I believe, that a considerable part of the machinery of the axle company was upstairs in the second story, on the floor where the little room and clock were. During the days while you were there about the inventory, did you confine yourself to that floor, or did you go all over the shop?

Ans. We went through the two little rooms already mentioned, and through the main room; that is, all over the upper story, and went over the large room next below that. I do not remember any other place, except the smith-shop, and what objects were outside of the building. It is possible we looked into a kind of basement or cellar where the wheel is; I think we examined the source of power—the machinery that creates the power in the work—the water wheel.

Q. 68. During those visits about the inventory, did he show or explain to you or talk to you about his devices at any other time than the morning you have just mentioned?

Ans. No, sir; not during the inventory.

Q. 69. During this interview which you have described, did you or did you not understand that he showed and explained to you all the principal contrivances he had devised, which he was in the habit of showing to people?

[*Objected to by Mr. Hill, as leading, calling for a mere opinion, and incompetent.*]

Ans. The impression made then on my mind was, that he had shown us all his improvements of interest at the shop.

Q. 70. In your fiftieth answer you testified, that at your visit in 1873, there were other machines in the room down stairs, which were idle and out of use at that time, and to which your attention was not then particularly directed; did you, during the inventory visits, recognize those machines and ascertain what they were?

Ans. Yes, sir; this reminds me that Mr. Drawbaugh also explained to us, on that first day of the inventory, a certain drilling-machine by which about six holes were made by one operation, which had been used in the manufacture of his rotary faucets; he stated that he had built it for the faucet company, and that it was of his design. He also, in a few words, explained the use of a few other machines that were standing idle on that floor, which had been used by that company and the pump company.

Q. 71. Do you remember any particular interview with Mr. Drawbaugh in 1877?

Ans. I cannot fix the date exactly; it was either in the latter part of 1876, or in the middle of 1877, that Mr. Drawbaugh was at my place when he was experimenting on hygrometers; he was then about to manufacture certain hygrometers, in which, he explained, he was going to use the glass of wood as the actuating part of the instrument, by which the indicator-hand would be operated. After he used the word "glass of wood," I asked him to explain what he meant by it; he showed me at some wood which we had on hand, that a part of the annual growth, or rings in the wood, were more compact or harder than other parts; that he wanted to use the more compact parts. Once, also, in 1877, I went with him to see Mr. Jacob Reichard, who lives on Race street, Harrisburg, Pa.; he and Mr. Reichard had a conversation in my presence on the taper-bit or auger, a cutting tool for making the taper holes in spigots. Mr. Drawbaugh wanted fifteen dollars to make the tool, and Mr. Reichard declined to pay that much for it; Mr. Drawbaugh said he could not make a good tool for less than that. I am not positive that this was in 1877, as I have no fixed data, but it was not far from that time.

Q. 72. You have described certain particular interviews between you and Mr. Drawbaugh in every year from 1867 to 1876 or 1877 inclusive. I now wish to ask you whether those are or are not all the interviews that took place between you during those ten years?

Ans. They are not all the interviews between me and Drawbaugh during that time.

Q. 73. At the various meetings between you and him during those ten years, as you would meet from time to time on the occasions you have specifically named, and on other occasions, was your talk merely a social conversation, or were there any particular class or character of subjects that you and he were in the habit of talking on; and if the latter, state what?

Ans. At our interviews we usually exchanged greeting as friends, and talked of each other's interests in a general way, but our conversation mainly related to our inventions, and sometimes we referred to the inventions of others.

Q. 74. During all those years, and down to the end of 1877, had you ever seen any electric speaking telephone made, or purporting to be made, by Daniel Drawbaugh?

Ans. I had not.

Q. 75. During all those years, had Daniel Drawbaugh ever told you that he had made an electric speaking telephone?

Ans. He had not.

Q. 76. Do you remember whether during the Centennial year, 1876, you had read in the newspapers of the existence of Mr. Bell's electric speaking telephone?

[*Objected to by Mr. Hill as irrelevant and immaterial.*]

Ans. I think it was by reading the newspapers I had become aware of that fact.

Q. 77. There have been put in evidence a number of articles from the Harrisburg newspapers relating to the electric speaking telephone of Mr. Bell, the first of which, I believe, is in the *Harrisburg Independent* of February 26, 1877, containing a long account of a lecture and exhibition by Mr. Bell, at Cambridge, Mass., and of the transmission by telephone, of a newspaper dispatch from Salem to Boston. Do you remember reading that article, or articles of that character, in the Harrisburg newspapers at that time, or about that time?

Ans. Yes, sir; but I cannot remember distinctly of reading the article in the *Independent* first mentioned, but I do remember discussing the contents of that article about that time. I can almost definitely state that I first discussed it at George Winters' place, on Second street, at that time.

Q. 78. If at any time before you had heard of the existence of Mr. Bell's electric speaking telephone, Mr. Drawbaugh had brought you, or shown you, at his shop, a practically operative electric speaking telephone apparatus, and told you that he wanted to patent it, but hadn't then the means to pay the Government fees and solicitor's fees, and had asked you to take out the patent on his credit, or on the credit of the invention, would you or would you not have done so?

[*Objected to by Mr. Hill as leading, hypothetical, calling for mere opinion, and incompetent.*]

Ans. From my habit in taking an interest in inventions, I certainly would have made an application for a patent, or caused it to be made, for Mr. Drawbaugh at that time, under the circumstances.

[Recess for dinner, until 2, P. M.]

JULY 17, 1882, 2, P. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Examination of Theophilus Weaver, by Mr. Storrow, continued:

Q. 79. You and the axle company had it in contemplation that you would take up and carry on the business of manufacturing axles at Mr. Drawbaugh's shop, the negotiations for which, however, fell through in March, 1876. If at that time Mr. Drawbaugh had produced to you a practically operative and successful electric speaking telephone, and asked

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you to take out a patent on it, and to aid him in manufacturing them, would you or would you not have done so?

[*Same objections.*]

Ans. I believe I would have done so.

Q. 80. You know what your relations with him were during the years you have testified about, and how freely he and you conferred with each other. I wish to know whether your relations were or were not such that he could have had practically operative and successful electric speaking telephones during a considerable portion of those years, made by him before they were heard of elsewhere, and which he was disposed to show to his friends generally, without showing them or mentioning them to you?

[*Same objection.*]

Ans. Under the circumstances, to believe that such was the case, is such a strain, in the situation of men and things, that it is incredible, if not impossible, to believe that he had such an invention reduced to practice, and shown it to so many others, and not have shown it or mentioned it to me.

Q. 81. It appears from the file-wrappers put in evidence, and printed in the defendant's volume of exhibits, pages , that Mr. Drawbaugh's nail-feeder, faucet, and pump patents, were taken out in 1865 and 1866, and that the next patents that he applied for, or that were applied for on his behalf, were those relating to the clock, and earth-batteries for the same. Did he come to you to take out those clock patents?

Ans. Yes, sir; I made application for him on his magnetic clock, which application, according to the rulings of the examiner in charge, was divided, and a separate application was made for earth-batteries relating to magnetic clocks, etc.

Q. 82. I see by the certified copies that the two Grissingers and Shettel were joint owners with him in the clock and battery. Had you personally known those three gentlemen before Mr. Drawbaugh brought them to you?

Ans. No, sir.

Q. 83. Among the Patent Office certified copies, is a letter printed in defendant's book of exhibits, page , signed by you, filing the application in the battery, and stating that "this application is supplemental to application by some party on magnetic clock, filed May 27, 1878." I suppose you saw him a number of times at your office while preparing the application on the clock, which appears from this paper to have been filed May 27, 1878, did you?

Ans. Yes, sir.

Q. 84. It appears from these certified copies of file-wrappers, that applications were filed for him on improvements in rotary-measuring faucets January 14, 1879, and an improvement in water-motors or water-wheels, July 2. 1879. Did you prepare and file those applications?

Ans. Yes, sir. I was attorney for Mr. Drawbaugh in those cases, in making those applications, but had some assistance in reproducing the drawings.

Q. 85. Who first came to you with reference to those applications. Mr. Drawbaugh or the other parties interested?

Ans. I understood Mr. Drawbaugh recommended me to those parties, and brought them to my place.

[*Answer objected to by Mr. Hill, so far as it undertakes to assume that Mr. Drawbaugh recommended the witness to said parties, as mere hearsay.*]

(Witness continues.) Mr. Drawbaugh first came to me, and spoke to me, that he desired that I should take out his application after this on patents, using the expression: "You can word the specifications better than I can."

Q. 86. Going back now to the time when you went to work on the clock application, about May, 1878, had you noticed any recent mention in the Harrisburg papers of the growth of the use of speaking telephones, and of their introduction into use in Harrisburg? I refer more particularly to those articles put in evidence by Miss Weaver's deposition, and to be printed among complainant's exhibits.

Ans. I had noticed at different times during that period, such articles appearing in the local papers.

Q. 87. When did you first read in any paper, or hear that Mr. Drawbaugh had constructed any electric speaking telephone?

Ans. I don't know that I had heard or read of his having constructed such prior to his making application on the magnetic clock; but that he was getting up a telephone. I supposing when I saw that notice in the paper that he was getting up some variation on the Bell telephone. I can't give the exact date, but think it was some time in 1878.

[*Statement referred to objected to by Mr. Hill as hearsay, and the supposition of the witness objected to as incompetent.*]

Q. 88. You may look at a paragraph from the *Harrisburg Telegraph* of April 18, 1878, put in evidence by Miss Weaver's deposition, and which is as follows:

[From Harrisburg Telegraph, April 18, 1878.]

"Daniel Drawbaugh, of Eberly's Mills, the mention of whose wonderful clock was first made in the columns of the *Telegraph* some time ago, is now engaged in the construction of a new telephone. If it is as great a success as the clock, Mr. Drawbaugh can be congratulated."

And state whether that is the newspaper mention you have just referred to?

Ans. Yes, sir.

Q. 89. If there was any conversation between you and Mr. Drawbaugh on the subject of electric speaking telephones and phonographs during the two months before May 27, 1878, will you please state what it was?

Ans. I don't recollect of having had any conversation in that period with him.

Q. 90. If at any time while he was at your office, say in the first half of 1878, with relation to the clock application, you had any conversation with him regarding electric speaking telephones or phonographs, will you state what it was?

Ans. I would like to first correct my first answer by stating, that when I spoke about a certain period, I meant the period that intervened between the time that Mr. Drawbaugh came to me to make the clock application and the time referred to in the newspaper extract quoted, and in answer to the question ninety, I state that I had not.

[*Mr. Storrow requested that the questions eighty-nine and ninety be read to the witness, suggesting that it was impossible that both answers should be correct; the questions and answers were thereupon read to the witness by the examiner, and witness says:*]

My answer to question ninety is: I had; during several weeks which elapsed while I was preparing the application for patent on Drawbaugh's magnetic clock, Drawbaugh sometimes came in to see me, and have conversations on the composition of the specification, and the setting forth of all the principles of his invention, the specification being necessarily a lengthy one, occupying about twenty pages of legal-cap paper, and the application being somewhat complicated, owing to several inventions being embraced in one application. Right at the beginning, in preparing the application, I stated that I believed we would have to divide the case and make several applications; some one's of the parties preferred that I should make one application; then I stated that I would draw up the application in such a manner that I could divide the application afterward, if required, and did so. Mr. Drawbaugh was, at that time, exhibiting his electric clock on Market street, Harrisburg, and he would sometimes come in while I was at work on his case. In one of those private interviews, then, he alone being present with me, he stated he, too, had experimented on the electric telephone years ago, and before Bell came out with his invention, and that he had some results, but that they were not of such a satisfactory nature as to go ahead at the time with his experiments; that he had given up his experiments for the time being, and now it was too late for him to hope to have any standing as the inventor of the electric telephone; but that he had some results, and that he had experimented considerably; and had also experimented on the phonograph before Edison came out; and since Edison came out, he had experimented further, using not only thin membranes as part of the means or as the diaphragm of the apparatus, but that he had also used pretty thick plates, and found that they answered as well, if not better, than thin diaphragms.

Q. 91. Did he say anything about connecting the clock with a phonograph or telephone, or acoustic instrument?

Ans. Yes, sir; he did. I believe that was mainly his object in opening the conversation. He stated he had not yet constructed the apparatus, but he was about to construct it. The device, he said, was intended to increase the compass, or loudness of the sound, and it was to be used in connection with either the phonograph or the telephone, and to be an attachment not only for his magnetic clock, but for clocks of other kinds than magnetic. The purpose of the device was to be, to cause the clock to announce the hours vocally, instead of striking the hours as in the usual manner. He, at that time, used a piece of the paper which I had lying on my table, on which I had sketched a part of the specification on one side. And he made a sketch in pencil, which he said would give me an idea of the device referred to. He said it was to operate on the principle of a vibratory long-arm lever, which, by having a vibratory touch given it some distance in from the end of the long-arm, would enhance the vibration of the end of the long-arm. He spoke to me on this wise, that he thought it was still patentable, and meant to make application on it for a patent. But that he did not feel inclined to let the Grissinger's, or party who were partners in the clock, have a footing in that invention, unless they would come out fair and square on the clock first. He stated he had experimented somewhat on the device in question, and believed he had good results.

Q. 92. Will you please produce the sketch referred to in your answer, as made by Mr. Drawbaugh on that occasion?

Ans. This is the sketch. (Witness produces sketch, which is put in evidence, and marked "Complainant's Exhibit, Drawbaugh-Weaver Sketch of 1878.")

Q. 93. Did the statements and assertions he then made to you make a distinct impression on your mind at that time as to whether Mr. Drawbaugh had, or had not, made a practically operative speaking telephone apparatus before Mr. Bell's invention was published? And if so, what was the impression it made on you in that respect?

[*Objected to by Mr. Hill as immaterial and incompetent.*]

Ans. I can't say that it made any decided impression, except so far as it prompted me to make further inquiries how far he had gone in his experiments at that earlier time.

Q. 94. Did you make further inquiries of him on that topic at that same interview?

Ans. Yes, sir; I did.

Q. 95. And what was the result on your mind, at the time of such inquiries, from the statements he made in response to them?

[*Objected to by Mr. Hill as immaterial and incompetent.*]

Ans. I regarded his case as almost hopeless, if not altogether, even as a successful experimenter, as he gave me to understand he had nothing to show how far he had gone in his earlier experiments. What he had used before was detached, and could not be gathered together; besides he did not appear to have reduced it to practical form. I then dismissed the subject from my mind, and I don't think we ever afterwards approached the subject when we came together; at least not in an earnest way, or with a view to taking out a patent, or doing anything at all in the matter.

Q. 96. If his statements had been such as to convey to your mind or leave upon your mind, the impression that he had gone far enough, according to his own statements even, to be entitled to claim to be the first inventor of the speaking telephone, would you, or would you not, have followed up the matter with a view to taking out a patent, or doing something about it?

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[*Objected to by Mr. Hill as leading, hypothetical, calling for opinion, and incompetent.*]

Ans. I believe I would have followed up the matter without delay, and would have taken proper steps at least to make an application for a patent on the invention. I came to this conclusion because I have taken an interest in other's patents before this, even at the risk of having an interference suit through it, when the case seemed to be a clear one.

Q. 97. It has appeared in this case that when Mr. Drawbaugh devised his improvement in nail-feeders, Mr. Eberly and Mr. Lee paid the expenses of experimenting, taking out the patent and getting up the first machine, and that when he first devised a rotary faucet, Croll, or Croll & Gardner, paid the expenses of experimenting, taking out the patent, and constructing the first faucets, taking, of course, an interest in the patent for doing so. Did you have a general knowledge of that part of his history?

Ans. Yes, sir; it came to me partly as a disclosure, in taking testimony before this.

Q. 98. Miss S. R. Weaver and her sister, who testified in this case, are they any relatives of yours?

Ans. Not to my knowledge.

Q. 99. Mr. Jacob S. Shopp has testified, on page 408 of the defendant's printed record, that you went to his house at a time when he was asked to give his affidavit. Did he or did he not understand that that affidavit was not to be used in Mr. Drawbaugh's favor, and might be used against him?

Ans. He was so informed at that time, that it might be used against Mr. Drawbaugh, and he remarked that it was a matter of indifference, because the facts were the same any way.

Adjourned until July 18, 1882, at 10, A. M.

JULY 18, 1882, 10, A. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Examination of Theophilus Weaver, by Mr. Storrow, continued:

Q. 100. In your thirty-seventh answer you referred to an invention which you made for Dr. Moffitt while working up his lock, and which you afterwards assigned to him. If you have since examined the official records, and ascertained the date of that patent, please state what it is?

Ans. I have examined the office report, and have made the following note regarding it: "Combined latch and lock, Oct. 26, 1869, No. 96,175, assigned to J. W. Moffitt."

Q. 101. How much have you been at Mr. Drawbaugh's shop since the spring of 1878?

Ans. I don't recollect that I was there at all since that time.

Q. 102. I suppose you needed to see the clock, or its works at least, while you were preparing that specification. Where did you see the works to make the drawings from?

Ans. The model in that application was a life-size clock, minus the case, and, I believe, showed all the co-acting parts. Moreover, I had seen his full-sized clocks in operation at the exhibition then being held on Market street, Harrisburg, near Adams' express office.

Q. 103 What had been your usual charge for taking out a patent up to that time?

Ans. The usual charge in taking out a patent, in ordinary cases, was twenty dollars, attorney fee, and the Government fees amount to thirty-five dollars.

Q. 104. Is that a usual rate of charge among patent solicitors. Are there many who take out patents at that rate?

[*Objected to by Mr. Hill, unless the foundation of the witness' knowledge on the subject is first shown.*]

Ans. It is the usual fee charged by some firms of patent attorneys, as that of Evans & Co., and of A. C. Snow & Co., both of Washington, D. C., as per advertisements in the local papers, but I find through practice in doing business for my clients, that such firms charge extra for drawing; sometimes at the rate of five dollars a sheet.

Cross-examined by Mr. Hill:

Cross-Q. 105. You are an attorney-at-law, are you not?

Ans. No, sir.

Cross-Q. 106. In your fifty-third answer, you stated that in 1875 you were employed as "counsel" in an interference case on Jacob Kline's patents. Did you use that word "counsel" in a Pickwickian sense?"

Ans. The word "Pickwickian" is so vague, that I know not how to answer it.

Cross-Q. 107. Were you in the habit of assuming to act as counsel in contested legal proceedings, for other parties than yourself?

[*Question objected to by Mr. Storrow, as ambiguous, because it does not appear whether it relates to contests in the Patent Office, or contests in the courts.*]

Ans. I have been employed several times in contested cases in the United States Patent Office, for other parties. In 1874, as attorney of record in several cases, or patents, of Alexander Morrison, superintendent of the Chesapeake Nail Works at this place. I acted as counsel both in the taking of his testimony at this place, and in cross-questioning at the taking of John Coyne's testimony, at Pittsburgh, Penna. And I was also admitted to argue that case in the Patent Office. I have since been acting in like capacity in several other interference cases.

Cross-Q. 108. Designate all the contested cases in which you have ever acted as counsel, and state the times?

Ans. I believe the first occasion in which I acted partly as counsel, was in an interference on switches for railroads, under the patent of William P. Patton, of this place, whose application was filed in 1866. Of which invention I became one-third owner, by purchase, at the beginning of the interference, and afterwards I became two-thirds owner, by purchase. In that case I first acted in the taking of testimony *per se.* Afterwards we employed Mr. Mason, of the firm of Holloway, Mason & Co., Washington, D. C. In 1875, as attorney of record in the Kline patents, I acted as counsel in an interference between Kline's patents on harvester-crank and pin, which had been re-issued shortly before, and one Wild's patent, of Baltimore, whose patent had been purchased by the Domestic Sewing Machine Company, and was then sought to be re-issued. I was only of counsel in that case. In 1879, I was likewise only associate counsel in an interference case between the applications for patent of Daniel Drawbaugh, the defendant in this legal proceeding, and that of David A. Hauck, of Mechanicsburg, Penna., whose inventions on rotary measuring faucets were put in interference by the rulings of the Patent Office. Those are all the cases.

Cross-Q. 109. In the contest between Morrison and Coyne, was there one interference or more than one?

Ans. Only one of his patents had been involved in interference, and there was afterwards a second interference between the same parties on another of Morrison's patents on nail separators. But on Coyne's side, if I mistake not, two patents were involved. I am not sure, just now, of the latter. In giving my answer above as to the number of interferences I had been engaged in, I considered it as but one contest between said parties, as Morrison did not act on the defensive in the second interference.

Cross-Q. 110. What is the name of the party who contested Patton's right to the invention in 1866?

Ans. Luther M. Simon, of Harrisburg, Penna.

Cross-Q. 111. Then the four interferences, Patton *vs.* Simon, Morrison *vs.* Coyne, Kline *vs.* Wild, and Drawbaugh *vs.* Hauck, are all in which you ever officiated as counsel, were they?

Ans. To the best of my knowledge.

Cross-Q. 112. How many of those cases, and which, did the client whom you represented win?

Ans. The first and last named won, and the other two lost.

Cross-Q. 113. In the last named, Hauck *vs.* Drawbaugh, did you take the testimony?

[*Objected to by Mr. Storrow, because the record thereof is already in evidence, introduced by the complainants, and is the best evidence of the fact.*]

Ans. I prepared the preliminary statement, and was alone, at the start, in the case; but when the testimony was taken, M. W. Jacobs, Esq., of Harrisburg, Penna., was called in, and I cheerfully assented that he should put the questions; but I was by at the taking of testimony, and was consulted in most instances.

Cross-Q. 114. Did you argue that interference at the Patent Office?

Ans. I did not; I had the pleasure of introducing the parties whom I first represented in the case to my present questioner, Lysander Hill, Esq., who, I believe, conducted the case to a successful issue, along with M. W. Jacobs, Esq., who is still retained.

Cross-Q. 115. Did you withdraw from the case before it came to argument?

Ans. I did; by my own request.

Cross-Q. 116. Did you have any hard feeling against your clients, Mr. Drawbaugh and the then owners of his invention of a rotary measuring-faucet, at the time of your withdrawal from their case?

Ans. I cannot say that I ever had hard feelings against Mr. Drawbaugh personally, nor against J. W. Moffitt, one of the owners, nor particularly against E. W. Chellis, the other owner; only in general against the latter, and then only as regards the manner of conducting that case, and the dilatory, and as I considered, improper conduct in prosecuting the magnetic clock case.

Cross-Q. 117. After you withdrew from the case, and before it came to final argument, did you have any conferences with Mr. Hauck, Drawbaugh's opponent, or his attorney, Joseph Ritner, Esq., with reference to said case?

Ans. As regards the last named, I don't recollect any conferences, only as I chanced to meet him on the street once or twice, in which I cannot recollect that any important questions were raised on the subject. In regard to David A. Hauck; he did call at my place two or three times, and there was some talk between him and me about minor details of the testimony, or rather, on the surroundings of the case.

Cross-Q. 118. As the result of these conferences between Mr. Hauck and yourself, did Mr. Hauck propose to get the taking of the testimony in the case re-opened, and to call you as a witness in his behalf?

Ans. Such was the result. I cannot say that it was of the conferences with me, but he felt so disposed, I know; and I finally firmly refused to do anything in the matter, for particular reasons, telling him honestly what I thought of his situation.

Cross-Q. 119. Are not these facts, to wit: that at first you agreed with Mr. Hauck to testify in his behalf if he could get the case re-opened; that the testimony you were to give related to confidential communications between Mr. Drawbaugh and yourself in the course of your employment in the case; that after receiving your assurances, Mr. Hauck went to Washington to get the case re-opened; that while Mr. Hauck was so in Washington you met Mr. E. W. Chellis and Mr. M. W. Jacobs at Mr. Chellis' store, in this city, and then and there Mr. Jacobs, having learned of the facts which I have stated, threatened you that if you carried out the plan he would institute proceedings to have your name stricken from the roll of persons authorized to practice in the Patent Office, and would have an action for damages brought against you, and that you thereupon went from the store to the telegraph office and telegraphed Mr. Hauck, at Washington, a dispatch, which you showed to Mr. Jacobs at the time, and the substance of which was that you had reconsidered the matter and would not testify in his behalf? And if those are not the facts, state which one is not, and give your own version of the matter.

Ans. Part of this tissue of questions is fact and part is falsehood. The threat is a fact; the telegram is not as sent. It simply read: "I will not appear for you." The communication referred to was not on matters confidentially stated to me after I became attorney in that case. The matter related to what I learned from Mr. Drawbaugh prior to his filing his application in that case. It is not a fact that I changed my mind after said interview with E. W. Chellis and M. W. Jacobs, Esq., but I had firmly decided not to appear for Hauck before I went to see them in the interview referred to; and, in consequence of that determination, I believe I went to see them, and had that conference, or something of that nature. It is a fact that I did not fully understand the responsible and almost sacred nature of the relation that an attorney stands in to his client until I was then sharply reproved by my friend Mr. Jacobs, and for which I gave him thanks at the time; for in the whole proceeding my sole object was to do right in the matter. It is not a fact, I believe, that Mr. Hauck went to Washington solely on account of said interview with me, or on account of what I may have disclosed, because I remember he was solicitous to consult his attorney, James L. Norris, Esq., of Washington, D. C., on other matters, as his case was then in limbo. I recollect he said he was going to Washington at any rate, for consulting Mr. Norris, and said that he would leave home in the next morning train.

Cross-Q. 120. You say you did not receive the communication from Mr. Drawbaugh after you were employed in the case, but prior to filing his application; did you receive that communication from Mr. Drawbaugh at your office in Harrisburg?

Ans. I am impressed it was at my office, some time before he had made his model, and of which I do not know that he ever did make a model.

Cross-Q. 121. At that interview at your office, was he consulting you with reference to the preparing and filing of his application?

Ans. I do not know that he ever made an application on that.

Cross-Q. 122. Was he consulting you with reference to the preparing and filing of an application, whether it was ever made or not?

Ans. Not at that interview.

Cross Q. 123. When was that interview?

Ans. I do not know that he ever consulted me to make an application, because the invention I considered unmade, in a certain sense; but the interview was in the fall of 1878, and this is partly the reason why I felt that I might be taking wrong steps, as I before intimated, in answer to a long question, because I was then acting as attorney for Mr. Drawbaugh in the clock case, at that time, although I had ceased to be attoron the faucet when the interview between Houck and me occurred.

Cross-Q. 124. Was said interview between you and Mr. Drawbaugh in November or December, 1878?

Ans. About that time.

Cross-Q. 125. Did you withdraw your appearance as attorney for Drawbaugh in the clock case and in the faucet case at the same time, or about the same time?

Ans. I believe I withdrew from the faucet case first, and from the clock case some months afterwards; I can't tell exactly how long afterwards.

[Recess for dinner, until 2, P. M.]

JULY 18, 1882, 2, P. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Cross-examination of Theophilus Weaver, by Mr. Hill, continued.

Cross-Q. 126. The faucet about which Mr. Drawbaugh made the communication, which you proposed to testify to in favor of Mr. Hauck if the interference testimony should be re-opened, was the same faucet about which the interference was instituted between Drawbaugh and Hauck; was it not?

Ans. The first part of the question states that I proposed, or volunteered, to offer testimony to Hauck, which is not the fact. Mr. Hauck had obtained a clue that I had certain information, and came to me and entreated me to give him the benefit of that information. At the first interview I did not give it. If it is now insisted that I shall answer that question fully, I cannot do so without casting reflections on Mr. Drawbaugh in a manner which I forbear to do, until I hear further.

Cross-Q. 127. Have you conferred with complainants counsel about the matter during the recess for lunch? I mean this faucet matter that I have been cross-examining about?

Ans. I have not; said counsel informed me that he would mention nothing whatever on matters relating to the cross-examination.

Cross-Q. 128. Now, what I want to know, is this: Did that communication from Drawbaugh to you refer to the faucet invention, which was subsequently in interference between Drawbaugh and Hauck? This question you can answer by yes or no, without reflecting on anybody.

Ans. Yes, sir; it had a decided bearing on the validity of Drawbaugh's claim to that invention.

Cross-Q. 129. How came Hauck to know that you had the information?

Ans. I cannot say, certainly. But I can see how it may have occurred.

Cross-Q. 130. Had you disclosed the fact to Joseph Ritner, Hauck's counsel?

Ans. I did not disclose any particular fact, but I did taunt Mr. Ritner, at a time when I met him on the street, after he had lost the case, at one or two hearings.

Cross-Q. 131. At what stage of the faucet proceedings did you withdraw your appearance in the Patent Office?

Ans. I cannot give the exact date, but it was not long after my questioner was employed in the case, and certainly before I met the parties referred to, to the best of my recollection.

Cross-Q. 132. Then it was soon after the closing of the testimony, and prior to the hearing before the examiner of interferences, was it not?

Ans. This reminds me that it was after the hearing before the examiner of interferences, for particular reasons which I prefer not to state.

Cross-Q. 133. It was before the hearing on appeal before the examiner in chief, was it not?

Ans. I am not positive. It may have been after the hearing before the examiner in chief.

Cross-Q. 134. How long was your interview with Hauck after you withdrew from the case?

Ans. I do not know which interview is referred to.

Cross-Q. 135. I mean the interview at which you promised Hauck to testify for him, if the case should be re-opened.

Ans. I cannot say that I definitely promised Mr. Hauck to testify for him at any interview, but told him I would hold it under consideration. When that interview was, I cannot definitely state. Mr. Hauck was pressing me to give the information, but I hesitated. Some talk may have led him to come to a conclusion of that kind, but I do not think that my talk could have been positively so construed. Still, he seems so to have inferred it. His case was desperate then, and he was catching at straws.

Cross-Q. 136. Reflect carefully, and state whether you did or did not promise Hauck to testify in his behalf if called upon, or to that effect.

Ans. This reminds me that I did say in that interview, that I would not appear for him unless he would compel me, by a writ from the circuit court served on me.

Cross-Q. 137. Did you tell him all that?

Ans. I did, to the best of my recollection, as now reminded.

Cross-Q. 138. Was that the only kind of a promise you gave him to testify?

Ans. I could not answer more definitely than I have already answered, in answer to the question before the last.

Cross-Q. 139. Then, in substance, you told him that if he would have you duly subpœnaed, you would testify to Mr. Drawbaugh's communication, did you not?

Ans. I believe I stated that if he would compel me in that manner, I would have to appear and testify, I not knowing that I could avoid it in such a case.

Cross-Q. 140. Did you undertake to appear as counsel in contested cases for other parties, without knowing what was the duty of counsel, and without knowing on what principles or rules evidence was to be admitted or excluded?

Ans. I did not fully understand the nature of my duties under those circumstances, nor did I understand all the principles which should be observed in the conduct of such cases.

Cross-Q. 141. At the interview with E. W. Chellis and M. W. Jacobs, at Chellis' store, to which I have heretofore referred, did you not tell those gentlemen plainly, that you had promised Mr. Hauck to testify in his behalf upon the matter?

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Ans. I am impressed I did not, except with the proviso already stated.

Cross-Q. 142. Are you willing to swear that you did not tell those gentlemen at that interview, without any qualification, that you had promised Mr. Hauck to testify in his behalf?

Ans. I cannot swear positively in the affirmative or the negative that I did so unqualifiedly. Further, I may not have used the same words with them that I did with Mr. Hauck at the interview referred to.

Cross-Q. 143. Your recollection then of what you had said to Mr. Hauck was pretty fresh, was it not?

Ans. It was not, until it was refreshed by a question a few moments ago.

Cross-Q. 144. I mean that at the time of your interview with Chellis and Jacobs, at Chellis' store, your recollection *then* of what you had said to Mr. Hauck during your interview with him was pretty fresh and clear, was it not?

Ans. I believe it was, but my recollection of, or ability to recall words, is not so good as it is recalling things or occurrences.

Cross-Q. 145. Do you think it is so poor that you might have failed at the interview with Chellis and Jacobs, at Chellis' store, to correctly recall the conversation which you had with Mr. Hauck at the interview with him?

Ans. There is this at the bottom of this question: I have heard so many false versions given to what occurred there, that if my words were even correctly reported, which I doubt will be the case, I would hesitate and study very much, if it were reported to me from that source, to believe my own words, and my memory is very good in that direction.

[*Answer objected to by Mr. Hill as irresponsive.*]

Cross-Q. 146. Do you mean to say that your memory of conversation is very good, so that you can give the exact words after a considerable lapse of time?

Ans. It is good enough for all practical purposes.

Cross-Q. 147. Then what makes you think that at that interview at Chellis' store, you may not have given those gentlemen the real statement that you had made to Mr. Hauck, but some other statement?

[*Objected to by Mr. Storrow, as assuming the witness to have said what he has not said.*]

Ans. Nothing.

Cross-Q. 148. Then I will ask you once more; did you, or did you not, at that interview at Chellis' store tell Mr. Chellis and Mr. Jacobs, without qualification, that you had promised Mr. Hauck to testify in his behalf in the interference, if re-opened, or to that effect?

Ans. I did not, without that proviso, to the best of my recollection.

Cross-Q. 149. State what proviso you refer to?

Ans. The proviso which I mean, to refer to the issuing of a certain writ, and enforcing its mandate on me to do so, or words to that effect.

Cross-Q. 150. Do you testify that you mentioned the writ at all to those gentlemen at that interview?

Ans. My impression is that I did, and that this was one reason why Mr. Jacobs took me in hand to lecture me, stating, if I mistake not, that such a writ could not be enforced upon me unless I was willing, or words to that effect.

Cross-Q. 151. How long a time intervened between the interview with Hauck, last referred to, and the interview with Chellis and Jacobs, at Chellis' store?

Ans. I do not know which interview is meant at Chellis' store, for I had other interviews there afterwards.

Cross-Q 152. When I have been referring again and again to a certain interview at Chellis' store, at which certain things took place, and no other interview at Chellis' store has been referred to in the deposition, and I again refer to it in the one hundred and fifty-first cross-question as "the interview with Chellis and Jacobs at Chellis' store," do you mean to say on oath, that you don't know what interview I refer to?

Ans. As I myself had referred to occurrences or occasions there, I deemed it best to be certain, and I can now answer, since "the interview" means that interview referred to.

Cross-Q. 153. Please answer the one hundred and fifty-first question now?

Ans. The length of time that elapsed was probably only about a day, if not less.

Cross-Q. 154. You state in your one hundred and fifty-first answer, that you did not know what interview I meant, because you had other interviews there afterwards, meaning at Chellis' store; and in your one hundred and fifty-second answer you say you had referred to occurrences or occasions there, and deemed it best to be certain, etc.: will you please refer to the record of your deposition, and point out any place or places therein where you may have made reference to any other interview with

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Jacobs and Chellis, at Chellis' store, than the one interview at the end of which you sent the telegram to Mr. Hauck, at Washington, as testified to?

Ans. I find I did make such reference in a general way in my answer to question one hundred and forty-five; that is what I referred to.

Cross-Q. 155. I understood that answer one hundred and forty-five to refer to the same interview; but you now state that it refers to some other time and interview; do you?

Ans. I regard this question, also, as not clear, because I meant in my said answer, or the answer about which the misunderstanding occurred, to refer, not only to that particular interview now most referred to, but also to occurrences or versions of things that occurred there on other interviews afterwards.

Cross-Q. 156. Did you ever have any other interview with Mr. Jacobs and Mr. Chellis there afterwards? If so, how many, and when?

Ans. I did. I don't know how many, nor when, except in a general way. I seldom met them both together. Mr. Jacobs would sometimes call in in the evening while my account as attorney on the Drawbaugh case was not fully paid off.

Cross-Q. 157. What was the subject of any one of those interviews which you had with Mr. Jacobs and Mr. Chellis, at Chellis' store, subsequent to the main interview, of which mention has been made?

Ans. It is hard for me to tell whether both were positively present, but I remember well having interviews there, in the back room, with Mr. E. W. Chellis and some of his friends. Probably M. W. Jacobs, Esq., was present. And the subject of conversation was sometimes on working up the new Drawbaugh rotary faucet, and of getting a good indicator to register the measuring of the faucet.

Cross-Q. 158. Did you have any trouble about getting your pay for services in the interference? Was there any dispute about it?

Ans. I cannot say that there was, or that there was any trouble in any way, except considerable delay.

Cross-Q. 159. As the result of all that had taken place in the interference, and between you and the owners of the Drawbaugh measuring faucet that was involved in it, did you feel friendly to them, and wish them success in their business of introducing the invention and making profit out of it, or not?

Ans. I may say safely that I wished them good success in every honorable way. So far as Mr. Drawbaugh is concerned, I stated in the be-

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ginning of my cross answers that I was friendly to Mr. Drawbaugh especially.

Cross-Q. 160. After the said interference was over, did you ever do anything to hinder or embarrass their business operations in connection with the manufacture and introduction of their faucets?

Ans. I did not, except as I acted against the course of certain dishonorable proceedings, as I had reason to believe it was such a proceeding, in the act of his outrunning me in the manner in which he did with the Reading Hardware Works some time afterwards; on what subject I await further question.

Cross-Q. 161. State just what you mean and all you mean?

Ans. I cannot tell consistently, or prefer not to, all I mean, but I do refer to the introduction of the new Drawbaugh measuring-faucet to the trade, then largely, if not entirely, owned by E. W. Chellis.

Cross-Q. 162. What interest had you in that matter, that caused you to interfere with Mr. Chellis' operation? State all about it.

Ans. The interest I had arose from the fact, as I believe, and as I think I have letters to show and to prove, that I was first to apply to said hardware company, seeking to interest them in the manufacture of an entirely different rotary faucet, which I had shown both Mr. Drawbaugh, the defendant in this case, and E. W. Chellis, in my office, at the time when I first practically tested it, they both having approved of it; Mr. Chellis, in an interview thereafter, having stated to me in as many words: "Go ahead with it;" that he was not going to put the new Drawbaugh rotary faucet out on royalty, but was going to have it put upon the market by a New York jobber, whose name, I believe, he did not give, and that he was going to manufacture his faucet himself, at his works at Eberly's Mills, he then having such confidence in the Drawbaugh faucet that he did not appear to care how many competed with him. After I had experimented further on modified forms of my faucet, and while I was corresponding with the Reading Hardware Company, I was informed by him one day, in the back room at his store, that he was going to have his faucet run by said company, and that they meant, and informed him that they would put a cut illustrating the Drawbaugh faucet into their illustrated price-list. I then wrote to the firm, and informed them that they had better well inquire regarding the validity of said patent before they would assume the responsibility of selling it; that I did not believe it was a valid patent, or correspondence in substance to that effect. Mr. M. W. Jacobs thereupon,

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for Mr. E. W. Chellis, sent me a threatening letter. As I am asked to tell all about it, I defer answering further this question till I can furnish day and date for many of these conferences. Concluding this answer by stating that all along, after the Drawbaugh application had been made awhile, that I believed that invention then in interference would be a mechanical failure, owing to its want of correct principles of construction, having stated some of these misgivings at different times to some of the parties concerned. I may as well state here, as this question will lead to another calling for such a statement, that this was one of the reasons why I withdrew from the Drawbaugh case, carefully avoided to be stated before. I mean the last part of my answer, by the words "this was one of the reasons."

[*Mr. Hill objects to all that part of the answer expressing the witness' opinion, contained between the words "concluding" and "concerned," inclusive, as not responsive and incompetent.*]

Adjourned until July 19, 1882, at 10, A. M.

* * *

JULY 19, 1882, 10, A. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Cross-examination of Theophilus Weaver, by Mr. Hill, continued.

Cross-Q. 163. In your last answer you testified that Mr. M. W. Jacobs thereupon, for Mr. E. W. Chellis, sent you a threatening letter. If you have that letter in your possession please produce it, in order that the examiner may make a copy of it upon the record.

Ans. This is the letter.

[The letter is offered in evidence by Mr. Hill, and a copy substituted by consent, as follows, and marked "Exhibit, Jacobs'-Weaver Letter:"]

"NO. 5 N. 3RD ST., HARRISBURG, PA., July 22nd, 1880.

THEOPHILUS WEAVER,
Harrisburg, Pa.

Sir:

Mr. Chellis is this afternoon in receipt of your postal card to the Reading Hardware Company. He has instructed me to begin an action against you at once. I prefer, however, first to give you this warning, *once and for all*, that you will be held responsible to the fullest extent of the law for any further interference in his affairs. You are pursuing a perilous course, as well as a very foolish one, and certainly will be made to understand, if you persist, both its folly and its peril.

Yrs, &c.,

M. W. JACOBS,

Attorney for E. W. Chellis."

Cross-Q. 164. Did you send more than one communication to the Reading Hardware Company by mail on that subject?

Ans. Not, that I recollect, more than one.

Cross-Q. 165. Was that a letter or a postal card?

Ans. I am impressed it was a postal card.

Cross-Q. 166. Please look at the postal card which I now show you, and state whether it is in your hand-writing, and whether it is the one that elicited the threatening letter from Mr. Jacobs?

Ans. That seems to be the communication. Its contents are a little different from what I thought they were.

(Mr. Hill puts said postal card in evidence, to be marked "Exhibit, Weaver, Reading Postal Card." The following copy is substituted by consent:

"HARRISBURG, PA.,
July 19, 1880.

If you have not concluded to handle the Drawbaugh new faucet, you had better wait a few weeks, as there may be some fun yet for other parties. I learn that you may be held liable.

Yours, &c.,

T. WEAVER."

(Address.)
"Reading Hardware Co.,
Reading,
Pa."

(Post-mark.)
"HARRISBURG, PA., *July* 19, 5, P. M.")

Cross-Q. 167. What did you mean by stating to the Reading Hardware Company, in your said postal card, "there may be some fun yet for other parties?"

Ans. I meant that William J. Lane, of Millbrook, N. Y, patentee of a measuring faucet, patented May 14th, 1878, and numbered 203,627, whose patent had not been put in interference with the Drawbaugh case, was about to cause trouble to the owners of said Drawbaugh patent. This I had learned about that time.

Cross-Q. 168. When you wrote further to them in the same card, as follows, to wit: "I learn that you may be held liable," did you have reference to a liability under said Lane patent?

Ans. Yes, sir; or subordinate to said patent.

Cross-Q. 169. You meant that they might be held liable under the Lane patent?

Ans. Yes, sir.

Cross-Q. 170. How did you first learn of said Lane patent?

Ans. I cannot tell exactly. I believe it was in examining the office reports.

Cross-Q. 171. Was it officially cited by the Patent Office, in their examination of the application of Drawbaugh for a patent on his measuring faucet?

[*Objected to by Mr. Storrow, as the public records of the Patent Office are the only proper evidence on that topic.*]

Ans. Not while I was in the case, to my knowledge.

Cross-Q. 172. Did you have any correspondence with Mr. Lane in regard to his patent?

Ans. I did make inquiries of him, in a letter.

Cross-Q. 173. You began the correspondence with him on the subject, did you?

Ans. I believe I did.

Cross-Q. 174. Don't you know perfectly well that you did?

Ans. I don't deny it.

Cross-Q. 175. How many letters did you write to Mr. Lane about it?

Ans I cannot tell. There were several.

Cross-Q. 176. How long before the date of this postal card, July 19, 1880, did you commence this correspondence with Mr. Lane?

Ans. I cannot tell. It was some weeks, at least.

Cross-Q. 177. Have you all the letters, or copies of all the letters, you wrote to Mr. Lane on that subject?

Ans. I don't recollect that I have any copies at present. I may have them.

*

Cross-Q. 178. Will you search your archives at the noon recess to-day, and if you have any, produce them here this afternoon?

Ans. I will.

Cross-Q. 179. In the meantime, will you state whether you informed Mr. Lane, in that correspondence, of the Drawbaugh measuring faucet, and that it was about to be manufactured or sold by the Reading Hardware Company?

[*Objected to by Mr. Storrow, on the ground that the letters themselves are the only proper evidence.*]

Ans. I believe I did, to that effect.

Cross-Q. 180. If I understood your one hundred and sixty-second answer correctly, after you withdrew from the Drawbaugh interference case on measuring faucets, you went to work and invented a measuring faucet of your own; am I correct?

Ans. I may have invented it before; I cannot tell exactly. I am searching a pass-book to find the date when I invented it. I cannot tell from this book, as this refers to times only when I had my faucet completed, and showed it to parties; but it was prior to June 6, 1879.

Cross-Q. 181. Your faucet was a rotary measuring faucet, was it not?

Ans. It was.

Cross-Q. 182. Did you file an application for letters patent upon it in this country?

Ans. That is a matter that the office deems proper to withhold from the public. I will not answer it unless it is insisted on.

Cross-Q. 183. I am not examining the "office," but you, and I do not ask for the contents of your application, but only for the fact whether you filed one, or not: please answer the question?

[*Objected to by Mr. Storrow, that the witness has a perfect right to decline to state whether he has or has not filed an application, if he deems it for his personal interest, which alone is to be consulted in the matter.*]

Ans. Since the question does not require the date of application, I answer, I did.

Cross Q. 184. Has any patent issued on that application?

Ans. It was only granted, but not issued.

Cross-Q. 185. In your thirty-seventh answer, as modified by your fifty-sixth answer, it appears that in 1869 you took out a patent for Dr Moffitt on sash locks, and that soon afterwards you invented an improvement in sash locks, which you patented and sold to him. When people employed you to take out patents on their inventions, were you in the habit of going to work to get up improvements of your own in the same lines of invention, and apply for patents on them, as you appear to have done in the Drawbaugh faucet case, and the Moffitt sash-lock case?

[*Objected to by Mr. Storrow, as an incorrect statement of the witness' testimony; in this, that it does appear that the witness was employed by Dr. Moffit not merely to patent an invention brought to him, but to work the lock up as an article for the trade, and that the improvement was invented in the course of that work; and in this, that it does not appear that the witness' invention in measuring faucets bore any relation to the Drawbaugh invention applied for in* 1879, *further than that both instruments belonged to an old and well-known class.*]

Ans. The question assumes that my invention in that case was a sash lock; it was not so stated in the title of the invention. I am not in the habit, properly restricted, of doing work as if to circumvent an application intrusted to me, but it often happens in working up an invention, that patentable changes have to be made, and in this way I sometimes became patentee in the same class, and assigned the patents to those for whom I worked.

Cross-Q. 186. Is that the true explanation of how you happened to invent the improvement in rotary measuring faucets in 1879?

[*Question objected to by Mr. Storrow, because it assumes that the witness was employed to work up Mr. Drawbaugh's faucet, or was expected to work up Mr. Drawbaugh's faucet, whereas nothing of the sort appears on the evidence.*]

[*Mr. Hill replies that the question assumes nothing at all.*]

Ans. No, sir; I claim to be able, sometimes, to make an original invention of my own; and in that case I simply followed out and embodied ideas on rotary faucets which I had tolerably clearly developed before I went into the Drawbaugh case.

Cross-Q. 187. And are you sure that that was an original invention of your own?

Ans. I so swore to it in my application for a patent, and I reaffirm it now.

Cross-Q. 188. I wish you to refresh your memory and state whether or not, as a matter of fact, that alleged invention, in substance, was not communicated to you by Mr. E. W. Chellis, at Mr. Chellis' store, in Harrisburg, at an interview at which you, Mr. Chellis, Dr. J. W. Moffitt, and Mr. M. W. Jacobs, were present, and whether Mr. Chellis did not then and there, in the presence of those gentlemen, make and exhibit to you a drawing of said invention, which you subsequently incorporated, in substance, in your application for a patent, and in accordance with which you proceeded to make some models, or patterns, and, possibly, faucets?

Ans. This is another tissue of questions that has very little truth to support it. I think all the parties were present, except Dr. J. W. Moffitt. He was present at other interviews, but I have no distinct impression that he was present at that particular time. Mr. Chellis did make a sketch of a conjectural faucet, but his plan was subsequently ruled by Mr. Drawbaugh, the defendant in this case, as too complicated and as impractical. I did not incorporate any of those principles in my faucet, and I will venture to say no inventor ever will in a rotary measuring faucet. As regards the rest of the question, it may be that it was some time after that that I got out my first patterns, which I showed to Mr. Chellis, and he never put in a claim for any particular part thereof, except a ruse, which he came on me about the indicator bell, and which I did not incorporate in my application for a patent.

[Mr. Hill requests the witness to produce, this afternoon, his correspondence with Mr. Lane, including his letters to Lane, as well as Lane's letters to him.]

[Recess for dinner, until 2, P. M.]

JULY 19, 1882, 2, P. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Cross examination of Theophilus Weaver, by Mr. Hill, continued:

Cross-Q. 189. Please answer the last part of my question, as to whether you did not proceed to get up patterns, a model, and a faucet or faucets, embodying substantially the invention shown in the drawing which Mr. Chellis exhibited to you as aforesaid?

Ans. No, sir.

Cross-Q. 190. Did you get up one of your faucets, and send it to the Reading Hardware Company?

Ans. Yes, sir.

Cross-Q. 191. Did you apply to that company to make or sell the faucets for you?

Ans. Yes, sir.

Cross-Q. 192. Did they decline to do it?

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Ans. They did, at first. But in subsequent letters they wished to have proper samples sent to them. They seem to have had in view some plan or arrangement by which they could make them, or have them made, if they approved them.

Cross-Q 193. After you sent them the sample, did they decline to make or sell them?

Ans. They deferred giving me a promise that they would undertake the work for me, as they were then very full of work of their own, and were about establishing a branch foundry further up on the Schuylkill, and they wanted time.

Cross-Q. 194. Have they ever made or sold any of those faucets?

Ans. None of mine.

Cross-Q. 195. Has your faucet ever been put onto the market for sale?

Ans. No, sir; only a sample or two have been sold and tested.

Cross-Q. 196. Why did you not have your patent issued after it was granted?

Ans. Because the letter of allowance or grant was re-called, and one of the claims rejected, by a ruling upon the discovery by the office that the claim was too broad, showing that a radial, full-sweep piston is not new, or patentable as such.

Cross-Q. 197. Did the office cite the Lane patent against you in your application?

Ans. No, sir.

Cross Q. 198. Have you searched for the Lane correspondence, to which I referred this morning?

Ans. I have.

Cross-Q. 199. Did you find it?

Ans. I did not.

Cross-Q. 200. Have you ever known, or heard that Mr. Lane has taken any steps, up to the present time, in the way of asserting his claim against Mr. Chellis' Drawbaugh faucet, as intimated in your postal card of July 19, 1880?

Ans. I have not.

Cross-Q. 201. You referred this forenoon to Mr. Chellis' playing a ruse upon you at one time. What do you mean by that?

Ans. It was in reference to the indicator bell I was speaking, and I find now, by reference to a pass book, that that occurred on the 15th of August, 1879. He then told me he wanted to tell me a secret, but I should never say a word to any one about it. That he intended to use a bell on their faucet, that would strike when the required amount of of molasses was drawn. I told him that was my invention, and that I had shown it to him in the drawing, which I had shown him on the 12th inst. He said he did not remember of my showing him a bell. I told him my index-wheel was of bell-metal, and was a bell in shape. I had made it so on purpose, as a bell. By "ruse," I mean a fraudulent play-off on me.

Cross-Q. 202. Was he playing that off on you as a practical joke?

Ans. It was no joke to me.

Cross-Q. 203. You made a memorandum of that conversation with Chellis, and just read it from your pass-book, did you not?

Ans. Yes, sir.

Cross-Q. 204. Did the drawing, which you showed Chellis on the 12th of August, as you say, have any striking apparatus for striking the bell?

Ans. It had not.

Cross-Q. 205. Referring to the patent which you took out for Dr. Moffitt on sash-locks in 1869, as referred to in your thirty-seventh answer, you state that you were engaged by him in working the thing up as an article for the trade; what were you to do for him in that direction?

Ans. I made certain cards of metal patterns for snap-work, such as are used in hardware foundries, and also got a small lot of locks cast for him, in a bill of my own on corn-shellers in the spring of 1870.

Cross-Q. 206. How came you to make the improvement on that lock which you patented?

Ans. The trouble in Moffitt's lock was, the tumbler would not hold the bolt locked, if the lock was turned upside down; and he wanted it to be a right-and-left hand lock, to put on either side of window sash, hence it was necessary to make certain alterations in the tumbler and its hold in the lock, to be applied in that manner.

Cross-Q. 207. And your patent was for those alterations which you made for that purpose, was it?

Ans. Yes, sir; mainly.

Cross-Q. 208. Did Dr. Moffitt request you to improve his lock so as to adapt it to the purpose you have referred to?

Ans. I believe he did, after I showed him a little sketch indicating how I believed it could be made; we had tried the other lock considerably before we came that far. He afterwards still believed his lock might be made practical, and tried it further.

Cross-Q. 209. Do you mean after you showed him the sketch and before you took the patent out?

Ans. No, sir; after the patent came out.

Cross-Q. 210. How did Dr. Moffitt get his first knowledge of your proposed improvement, did you communicate it to him, or did he first learn it from some other source?

Ans. I cannot tell surely; I believe it first came from me.

Cross-Q. 211. Please refresh your memory and see if you can state whether he didn't first learn it from some other source, and then question you about it, and demand that, if it was patented, you should assign the patent to him?

Ans. I have no such recollection at all, only this general recollection that no such demand was made of me.

Cross-Q. 212. You have referred, in the course of your deposition, to the fact that you sometimes have made inventions in the nature of improvements upon the inventions of your clients, and, also, that you have sometimes made inventions that were original with yourself; will you please give me a list of all the inventions of the latter class, that you ever made?

Ans. I take the sense of the question to be this: a list of patents in which I appeared as inventor, distinct from other parties, or employers; and I give the following list:

Desk and seat,	Nov. 20, 1864,	No.	45,286.
Table and seat,	" 29, 1864,	"	45,287.
Writing tablet,	Ap. 4, 1865,	"	47,175.
Whip socket,	Aug. 28, 1866,	"	57,603.
" "	July 30, 1867,	"	67,237.
Clothes-hook and line holder combined,	Aug. 18, 1868,	"	81,312.
Safety horse-hitch,	Nov. 24, 1868,	"	84,450.
Corn sheller,	July 6, 1869,	"	92,410.
"	Aug. 24, 1869,	"	94,050.
Hand corn-sheller,	Ap. 12, 1870,	"	101,949.
Spherical gears,	Aug. 1, 1871,	"	117,706.
Corn-sheller,	Nov. 26, 1872,	"	133,346.
Clothes washer,	Aug. 6, 1872,	"	130,168.
Cream freezers,	Mch. 26, 1872.		
Spherical gear,	Dec. 2, 1873,	"	145,075.

Carriage wheel,	July 21, 1874,	No. 153,207.
Dumping wagon,	Sept. 14, 1875,	" 167,715.
Nut lock,	Oct. 10, 1876,	" 183,089.

Cross-Q. 213. Now will you please give a similar list showing inventions patented by you, made in the nature of improvements upon inventions with which you had something to do for your clients?

Ans.

Combined latch and lock, Oct. 26, 1869, No. 96,175.
(Assigned to J. W. Moffitt.)
Sash-holder, Aug. 19, 1873, No, 141,904.
(Assignor to H. C. Demming, Harrisburg.)
Carriage seats, Oct. 25, 1881, No. 248,818.

I sold the last to the Anderson Manufacturing Company, of Lancaster, Pa., for whom I have been attorney.

Cross-Q. 214. In your forty-second, forty-third, and forty-fourth answers, as modified by your fifty-sixth answer, you state that in 1873 and 1874 you took out two patents for Dr. J. W. Moffitt on brake-shoes of his invention for cars; did you, about that time, make any invention of your own for brake-shoes?

Ans. Not at that time.

Cross-Q. 215. Did you at any time after Dr. Moffitt put his inventions in brake-shoes, or either of them, into your hands for the purpose of procuring patents thereon?

Ans. I did; several years after that.

Cross-Q. 216. About when was it that you did it?

Ans. I cannot tell definitely. I never made application for patent on them, and attached no importance to them afterwards.

Cross-Q. 217. Were they in the nature of improvements upon, or modifications of Dr. Moffitt's inventions?

Ans. No, sir; no more than on others.

Cross-Q. 218. Did you communicate knowledge of those brake-shoe inventions of yours to Dr. Moffitt?

Ans. Yes, sir; he saw them, I believe.

Cross-Q. 219. How did he happen to see them?

Ans. He frequently called at my place, and we were free to talk about our inventions and that of others. I had used my efforts to get him a proper footing by an assignment of his shoes to a western railroad company before that.

Cross-Q. 220. What was the name of that company?

Ans. I cannot give it now, and have no means to give it.

Cross-Q. 221. Did you correspond with the company for Dr. Moffitt?

Ans. No, sir; not to my recollection.

Cross-Q. 222. What had you done then to get him a proper footing in connection with that company?

Ans. I gave him advice, wrote certain assignments, and interviewed certain parties at the time the assignment was made.

Cross-Q. 223. Did the company take hold of his brake-shoes and introduce them?

Ans. I do not know.

Cross-Q. 224. When Dr. Moffitt first saw your invention of brake-shoe, did you show it to him, or did he accidentally discover it in your place of business?

Ans. I made no concealment of it. The pattern lay on an open shelf in my office for years. He might have seen it there accidentally.

Cross-Q. 225. Had you had some castings made of it?

Ans. Yes, sir; one sample, full size.

Cross-Q. 226. Did he not first know of your invention by accidentally discovering that casting under your work bench?

Ans. No, sir; it was lying on the floor quite a long time, on the side of the room, so that any one could see it.

Cross-Q. 227. When he learned of your brake-shoe invention, did he not manifest a good deal of indignation, and did he not then and there threaten you with legal proceedings unless you immediately dropped the matter; and did you not immediately drop the matter?

Ans. No, sir; Dr. Moffitt and I never had unkind words, and he never threatened me; and I did work for him afterwards. The same cordial relation existing between us to this day, to the best of my knowledge.

Cross-Q. 228. Did not Dr. Moffitt, upon learning of your said invention, tell you then and there that he would make trouble for you if you did not drop it, or to that effect?

Ans. No, sir; I recollect of words quite otherwise.

Cross-Q. 229. If you recollect then, state all that he said about it.

Ans. He said: "Brother Weaver, let me give you a bit of good advice. Don't put money in brake-shoes. I have tried it hard, and put a good deal of money into it. There is no money in it."

Cross-Q. 230. Is that all that he said about it, or the substance of all that he said?

Ans. That is all; and it is his kind way that helped me remember it.

Cross-Q. 231. How long was that after the issue of his 1874 patent on car-brakes?

Ans. I cannot tell now. It was quite a while, though. A year or two.

Cross-Q. 232. Did you ever take out any patents as joint inventor with others? If so, please give me a list of such patents?

Ans. Coffee mill, of Shetter and Shetter and Weaver, of 1881.
Creamer, Rudy and Weaver, to date August 1, 1882.

Cross-Q. 233. Did you ever have anything to do with the making of a sulkey-plow invention? If so, what and when?

Ans. I did, in 1874, as I find by official report. I invented it entire and distinct as sole inventor, and built a working sample, or several, and practically tried them at my own expense.

Cross-Q. 234. By what official reports do you fix the date?

Ans. By a memorandum taken from the Patent Office report.

Cross-Q. 235. Do you mean that you obained a patent on that invention? If so, what was its date and number?

Ans. Yes, sir; this was inadvertently omitted in the list given before. This patent is noted as follows:

"Sulky Attachment for Plows, Aug. 18, 1874, No. 154,306."

Adjourned until July 20, 1882, at 10, A. M.

◆

JULY 20, 1882, 10, A. M.

Examination resumed pursuant to adjournment.

Present, Mr. Chauncey Smith for Complainants, and Mr. Hill and Mr. Jacobs for Respondents.

Cross-examination of Theophilus Weaver, by Mr. Hill, continued.

Cross-Q. 236. In your two hundred and twenty-second answer, referring to what you did to help Dr. Moffitt to get a proper footing by an assignment of his brake-shoe to a western railroad company, you say that you gave him (Dr. Moffitt) advice, wrote certain assignments, and interviewed certain parties at the time the assignment was made. What certain assignments did you write?

Ans. It occurred to me, in thinking over my two hundred and twenty-second answer, that the papers I had drawn up were not accepted, and that the negotiating party from the west, some self-styled judge, I know not who, acted somewhat dictatorial—had the papers drawn pretty much his own way—and my advice was to some extent disregarded.

Cross-Q. 237. Was the self-styled judge acting for the railroad company or for Dr. Moffitt?

Ans. For the railroad company, and of course, after contract, became a partner, to some extent, in the invention.

Cross-Q. 238. Am I to understand you that you prepared assignment papers for Dr. Moffitt, and gave them to him, but they were not subsequently executed by him?

Ans. I cannot say that I gave them to him, but he came to my place and after conversation, and noting down certain data, he left me, stating that he would expect me to meet him at a certain place, and wanted me to be there and counsel him, and overlook the transfer. I drew up such papers, expecting that they would be acceptable to both parties. But before negotiations were started really, I further had words with said Dr. Moffitt, and heard that he had waived certain conditions which I before had cautioned him about, and the papers were useless. I did not produce them, and his invention became a tied-up, dead thing in consequence.

[*The last clause of the answer objected to by Mr. Hill, as irresponsive and mere opinion.*]

Cross-Q. 239. Then you never showed him the assignment papers which you had drawn up, did you?

Ans. I may have. My impression is I did not.

Cross-Q. 240. Had he requested you to draw up assignment papers for him?

Ans. I cannot tell now. That is my impression.

Cross-Q. 241. In what part of the west was the railroad located, with the owners of which he was negotiating in that affair?

Ans. In the far west.

Cross-Q. 242. The outcome was, that he assigned his patent to that railroad company, was it?

Ans. I don't know the meaning of the word outcome.

Cross-Q. 243. Did he assign his patent to that railroad company?

Ans. That is a question that was debated by us at the time. I believe he did.

Cross-Q. 244. Is your meaning this: That he made a contract with the railroad company, which you construed to be an assignment?

Ans. Yes, sir.

Cross-Q. 245. What parties did you interview for him at the time the assignment was made?

Ans. Mr. Whitney, then superintendent at the Pennsylvania canal, is all that I can now mention or recollect. I believe he is the only party.

Cross-Q. 246. How many times did you interview Mr. Whitney on that matter?

Ans. Only once to my knowledge. I had met him on the street.

Cross-Q. 247. Do you mean that the interview was a meeting with him on the street?

Ans. Yes, sir; and conversation with him.

Cross-Q. 248. Who was present at that interview?

Ans. There was no one to take part in it but us two.

Cross-Q. 249. Why did you interview Whitney on that matter. What had he to do with it?

Ans. If I remember correctly, he had first interested his friend, said judge, in said invention, and was to have had a footing in the benefits by said assignment.

Cross-Q. 250. What was Whitney's full name, and what is his present address, if he is living?

Ans. I cannot give it, but it is in the city directory. He may own property here yet, but is away. I can ascertain. I don't know his initials.

Cross-Q. 251. You have referred, in your one hundred and second answer, and the answers immediately following, to an interference of William P. Patton against Luther M. Simon on railroad switch; what attorney conducted the taking of the testimony submitted on behalf of Mr. Patton's claim to priority in that case?

Ans. Mr. Patton had no attorney by formal appointment, but I was present as an interested party, on that occasion, and was permitted to say a few words by the master, before whom it was taken.

Cross-Q. 252. Did not John C. Kunkle, Esq., then a well-known lawyer in this place, conduct the taking of the testimony in behalf of Mr. Patton's right?

Ans. Not at the first taking, but at the re-taking of the said testimony. He was employed only for about two hours.

Cross-Q. 253. Why did the testimony have to be re-taken?

Ans. Mainly on account of incompetency of the master to check the over-bearing manner, if I remember rightly, of the opposite counsel.

Cross-Q. 254. Who was the opposite counsel, and who was the master, to whom you referred in your last answer?

Ans. I believe the counsel was A. J. Herr, Esq., and the master was Alderman Maglaughlin. I don't remember his first name; he was an old man.

Cross-Q. 255. Was the testimony taken on behalf of Mr. Patton before Mr. Kunkle was brought into the case thrown out by the Patent Office?

Ans. I believe, upon our complaint of certain irregularities at the taking, we were permitted to re-take the testimony, and what became of that first taken, I cannot tell.

Cross-Q. 256. When taken the second time, before what magistrate was it taken?

Ans. My impression is, it was taken before M. L. Bower, alderman in the upper part of the city.

Cross-Q. 257. When the testimony in behalf of Mr. Simon's claim of priority was taken, who cross-examined the witness?

Ans. Rodney Mason, Esq., of the firm of Holloway, Mason & Co., Washington, D. C.

Cross-Q. 258. Who argued that case at the Patent Office in behalf of Mr. Patton?

Ans. Said Mason, Esq., but after having lost a decision, I wrote an argument to assist him in the next hearing.

Cross-Q. 259. Do you know whether that argument was used at the hearing?

Ans. Mr. Mason stated so in a letter, and said that he had used it to advantage.

Cross-Q. 260. In your one hundred and eighth answer you stated that you became one third owner of Mr. Patton's said invention, by purchase, at the beginning of the interference, and afterwards became two thirds owner by purchase. Who owned that invention at the time when the testimony was taking in the interference?

Ans. Said William P. Patton had at first one third interest in it, and likewise Isaac Lloyd and myself had each one third interest in the invention—all of Harrisburg—but at some period during the interference I purchased Mr. Patton's interest, as stated. At one period of the taking of the testimony we all three were owners, but before the close of the taking of the testimony Mr. Lloyd and I owned the whole invention.

Cross-Q. 261. Did you obtain your interests by an assignment or assignments, in writing?

Ans. I presume I did.

Cross-Q. 262. Don't you remember whether you did or not?

Ans. Yes, sir; I have some recollection of it; not very clear, only remembering that it was a necessity for me to buy him out.

Cross Q. 263. Why a necessity?

Ans. He had not money to meet his share of the expense in prosecuting the interference.

Cross-Q. 264. How many assignments did you receive from him of interests in that invention?

Ans. Two.

Cross-Q. 265. Were they recorded in the Patent Office?

Ans. My impression is only one.

Cross-Q. 266. Have you those two original assignments among your papers?

Ans. I cannot positively state so. My impression is I handed over the second assignment to one Jacob G. May, to whom I afterwards sold that same interest that I had purchased by the second assignment.

Cross-Q. 267. Will you search among your papers for those assignments, and if you find them, or either of them, produce what you find this afternoon?

Ans. Yes, sir.

Cross-Q. 268. Referring to the interference between Hauck and Drawbaugh, mentioned in your same one hundred and eighth answer, were not your duties in the taking of the testimony in that interference, as "associate counsel," limited to acting as a clerk, for the purpose of making a copy of the written depositions?

Ans. No, sir; not entirely.

Cross-Q. 269. State all else that you did in that contest?

Ans. I never ceased to have a proper status as attorney of record in that case, and by me, notice was given to the opposite party of such takings of testimony as are customary in such cases. After I had written the preliminary statement, which was the frame of the case—although the questions were put, at the taking of the testimony, by Mr. Jacobs, Esq.—I was often consulted; although, I did act in capacity of clerk. Owing to this latter fact, and other circumstances, when the

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time came for printing the testimony, I first objected to appear as counsel by mention, along with the published testimony. But was pressed by Mr. Jacobs, my associate, to let it stand with his.

Cross-Q. 270. Were you consulted in that case as to what witnesses should be called and examined, before they were put upon the stand?

Ans. I cannot understand the drift of the question. Whether it means I had nothing to say at all with reference to who should be brought in as witnesses, or not. In most cases I was little consulted, and the machinery of the case was run secretly.

Cross-Q. 271. Did the owners of the Drawbaugh invention, and their counsel, Mr. Jacobs, or any of them, even let you know the names of the witnesses, except as you learned them by actually seeing the witnesses called upon the stand to testify?

Ans. Some of them. Others I did not know.

Cross-Q. 272. How many of them, and who did you know were to be called, before you actually saw them called upon the stand to testify?

Ans. I cannot tell how many, unless I had the testimony before me. I remember these: E. W. Chellis, himself; Phillips, the alderman's clerk; John W. Moffitt; Ira D. Kahney, the miller at Eberly's Mills; and Herman K. Drawbaugh, was counted, but was captured by the opposite party.

Cross-Q. 273. Do you mean to say that you knew that all these gentlemen would be called as witnesses on Mr. Drawbaugh's side of the case?

Ans. Yes, sir; and others which I cannot now name. Some of them had been named to me by Mr. Daniel Drawbaugh himself, and it was in that way I was able to frame the preliminary statement, by having consulted him.

Cross-Q. 274. Did you ever know why the machinery of the case was run secretly from you?

Ans. Not, certainly.

Cross-Q. 275. Did you ever know why Mr. Jacobs was brought into the case to manage it as counsel?

Ans. Certain reasons were given me by Mr. Chellis, but I don't know whether his words spoke facts.

[Recess for dinner, until 2, P. M.]

JULY 20, 1882.

Examination resumed pursuant to adjournment.

Present: Mr. Chauncey Smith for complainants, and Mr. Hill and Mr. Jacobs for respondents.

Cross-examination of Theophilus Weaver, by Mr. Hill, continued.

Cross-Q. 276. Did you make search for the Patton assignments, as I requested you this forenoon?

Ans. Yes, sir.

Cross-Q. 277. Did you find any of them; if so, how many?

Ans. Only one, which pertains to the sale of Patton's last third interest in the patent mentioned, and in one related thereto. Here it is.

[Witness produces assignment acknowledged by Wm. P. Patton, April 14, 1866, and recorded at the Patent Office, May 21, 1866, in Liber G, 8, page 466, of transfers of patents.]

Cross-Q. 278. In the interference of Morrison against Coyne, in the taking of the testimony, did you have charge of the examination of Morrison's witnesses, and the cross-examination of Coyne's witnesses, and did you put the questions to them?

Ans. Yes, sir.

Cross-Q. 279. In the interference of Kline against Wild, did you have charge of the examination of Kline's witnesses, and the cross-examination of Wild's witnesses, and did you put the questions to them?

Ans. Yes, sir.

Cross-Q. 280. Who argued that case in the Patent Office in behalf of Kline?

Ans. Both the senior member of the firm of Evans & Co., and myself.

Cross-Q. 281. Did you argue it orally, or in writing?

Ans. In two printed briefs, and orally in part.

Cross-Q. 282. Can you tell me what was the first patent you ever took out as attorney for any inventor, and when it was?

Ans. I took out my own first two patents in November, 1864, both on the same day.

Cross-Q. 283. You didn't act as attorney for yourself. What I wanted to know was, what was the first you ever took out as attorney for anybody?

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Ans. If I remember correctly, it was on a horse-hitch of William A. Middleton and J. Haller, 1868, some time in the spring.

Cross-Q. 284. Did you take out a patent on anything else for Middleton and Haller, or either of them, that year?

Ans. Never anything else for Haller, nor for said Middleton that year, to my knowledge.

Cross-Q 285. Did you ever take out any other patent for either of those gentlemen at any time?

Ans. Yes, sir.

Cross-Q. 286. What, when, and for whom?

Ans. The patent of William A. Middleton, Harrisburg, metallic fence-post, February 16, 1869, No. 86,935.

Cross-Q. 287. Did you have anything to do with any clothes-hook or line-holder invention in 1868, for anybody, prior to your own patent of August 18, that year?

Ans. I made patterns, possibly in the spring of 1868, or latter part of that year—I believe it was in the spring—for one Zinn, on line-holder or clamp.

Cross-Q. 288. Had Zinn patented his line-holder at the time?

Ans. He had patented one some time before that, quite different in construction.

Cross-Q. 289. Prior to applying for any of your patents on corn-sheller, did you have anything to do for anybody else on the subject of corn-sheller inventions?

Ans. Not to my recollection.

Cross-Q. 290. Were you not consulted by anybody on that subject prior to that time?

Ans. Not to my recollection.

Cross-Q. 291. Possibly I can aid your recollection a little. Prior to that time, were you not consulted by one Brady, of Mount Joy, Lancaster county, Penna., with reference to a corn-sheller that he had invented, and did you not discourage him from proceeding to patent the same; and did you not, soon after, yourself apply for letters patent on a corn-sheller?

Ans. Not to my recollection. He had a corn-sheller of his own. I don't recollect ever discouraging him about that or any other. I dealt at his works or foundry, and got castings from him, after my patent had issued. My invention was entirely different in patentable features.

Cross-Q. 292. Had he consulted you with reference to his corn-sheller?

Ans. Not to my recollection, as a consultation. We had conversations when together. He did not ask my advice, that I can recollect.

Cross-Q. 293. How came you to first know about his corn-sheller?

Ans. By seeing it at Henry Gilbert's hardware store, Harrisburg.

Cross-Q. 294. Did Mr. Brady never explain to you any proposed improvement on, or modification of, his corn-sheller?

Ans. I think he did talk at one time with reference to the holder—one or two changes inside or the working or actuating of the jaws.

Cross-Q. 295. Is that all the change or modification that he ever proposed or suggested to you that he was going to make, or was thinking of making, on his corn-sheller?

Ans. I cannot tell what he was thinking of. That is all that I recollect. I believe that it is fully all that he stated to me.

Cross-Q. 296. Where did he tell you that?

Ans. I cannot tell. I met him at a fair. I also met him at his works. He was never my client.

Cross-Q. 297. With reference to your dumping wagon, patented September 14, 1875, had you been doing any work on dumping wagon inventions for anybody else not long before you applied for that patent?

Ans. I had been, some time before that.

Cross-Q. 298. For whom?

Ans. For Hamilton Baily, of Harrisburg.

Cross-Q. 299. What had you been doing for him on dumping-wagon inventions?

Ans. I took out a number of patents, and built a number of models for his patent wagons. I cannot give the date and number now, but will, if desired, furnish data.

Cross-Q. 300. Referring to your patent for sulky attachment for plow, dated August 18, 1874, did you get into trouble with anybody about that application for patent?

Ans. Yes, sir.

Cross-Q. 301. With whom did you have that trouble?

Ans. With one Rev. H. D. Kutz, now of New Haven, Conn.

Cross-Q. 302. Did Kutz commence legal proceedings against you in connection with it?

Ans. He attempted at one time do so.

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Cross-Q. 303. Were his proceedings in the nature of a criminal charge for perjury?

Ans. I did not know it to be such charge.

Cross-Q. 304. Did he employ counsel, if so, who?

Ans. I think I was notified by one George H. Irwin, Esq., on Third street, Harrisburg, who notified me to appear before him before proceeding against me for him, the said Kutz.

Cross-Q. 305. Mr. Irwin is a well-known lawyer of this city, is he not?

Ans. He is known, and has some practice.

Cross-Q. 306. Did you appear before him in response to that notification?

Ans. Yes, sir.

Cross-Q. 307. Did you assign a part interest in that patent on sulky attachment for plows to Mr. Kutz, if so, what interest?

Ans. I did not give him a formal assignment.

Cross-Q. 308. What did you give him?

Ans. My impression is it was a receipt for some twenty one dollars, with a promise or agreement to make an assignment of the half interest on the performance on his part, I think, of certain other conditions. I cannot state precisely the tenor of the paper.

Cross-Q. 309. Is that paper, or a copy of it, in your possession?

Ans. It is not. I can produce a copy. I learned it was recorded at Washington.

Cross-Q. 310. Will you please procure a certified copy from the Patent Office at Washington, at my expense, and produce it here?

Ans. Yes, sir.

Cross-Q. 311. Why did you, in that transaction, execute a receipt to Mr. Kutz for twenty-one dollars. What did that grow out of, and how?

Ans. It came about as follows: Sometime in the end of 1872, said Kutz came to me to see whether I could secure a patent for him and his partner, S. A. Stockstill, of Medway, Ohio, on an application already filed in the Patent Office, in charge of Munn & Co., their attorneys, which had been rejected. He stated that if I could get a patent for him I should be well repaid. I became attorney, in due form, for said parties. Proceeded to Washington. Attended to that case, in connection with other business. And shortly after my return, in 1873, sometime, I procured a patent for them, which is dated April 15, 1873, No.

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137,870, and was paid for my services. On trial of said plow—said patent having been on a plow, also an attachment in its nature to common plows—it was found to be inoperative on hilly ground. Mr. Kutz, after considerable time, came back to me, and asked me if I could change the attachment, so as to make it work satisfactorily on hilly ground. I told him I did not know, but would study over it, and he was to return at a certain time. I then studied over the matter, and the invention came to me, as nearly all inventions do, by intuition. I drew the thing on paper, and showed it to him when he next came to me. He was pleased with it, and after some talk we agreed to go together and take out a patent, he stating that if I would draw up the papers and make a model, we would take it out, and he would pay said twenty-one dollars. The work, after filing the case, to be carried on as stipulated by the conditions of the receipt referred to, of which you requested a copy. When we came to swear to the invention, he wanted to swear to the invention as joint inventor with me, and I objected to his doing so, stating that I believed it would invalidate our patent afterwards, when it became known that I had invented it, as it had no points common with his former patent. He insisted on swearing to his papers, so we went to the alderman's, and we took the oath to the specifications. After leaving me, he then having gone away for several weeks to an eastern town, I was so mortified at the circmstance that I withheld sending it, still meaning to do right by him as a partner. And I drew up a second specification paper, and swore to it, and sent it to the Patent Office as sole applicant, informing him on his return of my action, and stating my reasons. After some words we agreed again, and proceeded to work up the invention, he stating that he would be willing to pay one half the money necessary to build a full-sized attachment, for actual trial of the thing before the issue of the patent. I being then willing to give him the whole concern, if he would pay for what it had cost me, and my trouble. By an understanding that he was to pay more when he returned the next time, I proceeded to build, and had built, the device, according to our verbal agreement. When it was made, and ready for trial, I asked him: "Are you willing to take the risk—to pay one half the cost on it, whether it works or not?" He said he would pay one half the cost if it worked well, but he wouldn't pay anything if it didn't work, and I was stuck again. And I said: "You are not the man for me to be a partner with. I will pay you back your money, assume the risk, and take out the patent." That he wouldn't do either. The time came when the patent had to be lifted, and I paid its final fee for it. That is how it came about.

Cross-Q. 312. When you and Mr. Kutz went to the magistrate's office, and he swore to the papers as joint inventor, did you also swear to them as joint inventor?

Ans. That I cannot tell, as the form in the office rules then differed from what it is now, and I think I had an older form to guide me in writing it.

Cross-Q. 313. Isn't your recollection good enough to enable you to state from memory whether or not you swore to them as joint inventor with him?

Ans. I am not positive.

Cross-Q. 314. What is your best recollection about it?

Ans. My impression is, we simply both swore as the original and first inventors.

Cross-Q. 315. Your recollection, then, is that you took the oath with him; is it?

Ans. Yes, sir.

Cross-Q. 316. But that you took it with a mental reservation arising from the form used; is that it?

Ans. Not on my part, for I half believed he would not do it.

Cross-Q. 317. Did you think it any worse for him to take the oath of joint invention, who apparently believed it right to do it, than for you to take the same oath, who profess that you knew it to be wrong to do it?

Ans. That is not for me to say, for I felt convinced afterwards that it was wrong, on both our parts, to do it in that way.

Cross-Q. 318. Did you not feel convinced of that till afterwards?

Ans. Not so fully.

Cross-Q. 319. What new facts came to your knowledge after taking that oath that modified your views of the moral character of the transaction?

Ans. He had at the time argued that he had given me some general idea to make a plow attachment adapted to be adjusted manually for hilly ground, without stating the plan or detail of the invention. He thought by virtue of that he could take the oath, but I, upon more mature reflection, and in hunting up some other cases, found that that general idea or adjustable feature of a plow attachment was not new, and he had really not made any part of the invention.

Cross-Q. 320. Was that all he claimed at the time to have suggested to you that was incorporated in that application?

Ans. Yes, sir; I am positive of that.

Adjourned until July 21, 1882, at 10, A. M.

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JULY 21, 1882, 10, A. M.

Examination resumed pursuant to adjournment.

Present: Mr. Smith and Mr. Storrow for complainants, and Mr. Hill and Mr. Jacobs for respondents.

Cross-examination of Theophilus Weaver, by Mr. Hill, continued.

(Witness desires to state as follows:) I wish to state that I should have used the expression "so-styled judge," instead of the expression "self-styled judge" yesterday afternoon in my testimony, when referring to Dr. Moffitt's case, and I thus correct it now, as in thinking over it I believe he was introduced as judge to us.

Cross-Q. 321. In your three hundred and eighth answer you say you gave Mr. Kutz a receipt for some twenty-one dollars, with a paper agreeing to make an assignment of a half interest on certain other conditions; was that done at Mr. Irwin's office?

Ans. Not exactly in that many words.

Cross-Q. 322. Where was it done?

Ans. I may not understand the question.

Cross-Q. 323. Where was that receipt and paper executed?

Ans. I think the receipt was first given at my office for probably sixteen dollars, and probably there was added to it five dollars a short time afterwards at my office. I never saw it since. I cannot positively state this morning whether it was ever recorded, as intimated yesterday, only that Mr. Kutz said that he would do so; namely, have it recorded.

Cross-Q. 324. Were the receipt and the agreement to assign separate papers, or were they both one paper?

Ans. Only a few lines on one paper.

Cross-Q. 325. Was that paper executed after your interview with Mr. Irwin, in response to his notification?

Ans. There was a legal tender made to Mr. Irwin of the amount of money received, with interest, which was not accepted, and then an offer

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made to divide territory, or anything that would be right and proper under the circumstances.

Cross-Q. 326. That does not answer my question. Will you please notice more particularly what I asked you?

Ans. That is all that ever was done at Mr. Irwin's, or elsewhere, except that we met several times afterwards and tried to adjust the matter between us, but failed. I mean by "we," Mr. Kutz and I.

Cross-Q. 327. I repeat the question. Was that paper executed after you appeared at Mr. Irwin's office in response to his notification? I mean was it *made* or *signed* after that?

Ans. It was made long *before* that in *my* office.

Cross-Q. 328. How came it to be made before that?

Ans. I have already partly stated, in former answers, how it came to be made. I made the drawing, prepared the case for an application for a patent, and also made the model, which, by our estimate, was worth about twice as much, or nearly, as the twenty-one dollars, or the amount of the receipt, I not having counted the invention much, and expecting that he would run the invention, or sell it, he alleging that I should be well repaid if he made anything out of it.

Cross-Q. 329. I understand you that there was a paper made containing a receipt and an agreement to assign the half interest to Mr. Kutz on certain conditions. I want to know whether that paper was made and delivered to Mr. Kutz before or after you received the notification from Mr. Irwin?

Ans. I am not certain that such were the conditions of the paper, but a receipt of a small sum of money, whatever it was, and some explanations attached to it—the only paper that ever passed between us—was made long before Mr. Irwin was approached by Mr. Kutz on the subject.

Cross-Q. 330. And was it delivered to Mr Kutz before Mr. Irwin sent you the notification?

Ans. Yes, sir.

Cross-Q. 331. Was that receipt a receipt by you of money from Kutz, or a receipt by Kutz of money from you?

Ans. As stated, it was a receipt from me of money, by way of starting the application. Of course the money, I suppose, came from Kutz or his intended father-in-law. It was not handled by Mr. Irwin, to my knowledge.

Cross-Q. 332. When you appeared before Mr. Irwin in response to his notification, what did he want with you?

Ans. He did not specify particularly, only that he was employed by Mr. Kutz to attend to his interests in some way connected with that plow attachment already referred to, and asked to appear before him. I don't remember any particular other purport of the notice.

Cross-Q. 333. Did the notice contain any intimation that he would proceed against you in behalf of Mr. Kutz?

Ans. Yes, sir; I gathered that from the notice.

Cross-Q. 334. Now, when you did appear before Mr. Irwin in response to the notice, what did Mr. Irwin state that he wanted of you?

Ans. All that I particularly remember, is that I made him a legal tender of the amount referred to, and, after refusing, he was about to state the course he was going to pursue. I don't remember that I waited or had many words, or heard many, either, from Mr. Irwin, for my main object was to make the legal tender, and then let action be brought, and the worst be done that could be to prove that I had not done my part. I do not think Mr. Irwin stated his course distinctly to me.

Cross-Q. 335. Did Mr. Irwin cause any legal proceeding, of any character, to be commenced against you?

Ans. No, sir; not to my knowledge.

Cross-Q. 336. Do you wish to be understood that, after Mr. Kutz found his invention to be inoperative on hilly ground, he requested you to change the attachment, so as to make it work satisfactorily on such ground?

Ans. He did not use words implying that it was to be a mere change of the sulky attachment patented by him and Mr. Stockstill the year before, but spoke to me of the necessity of making a sulky attachment for plows that would answer that purpose better than his. I do not believe now that he wanted to have his former partner have any show in the improvement. He wanted it to be distinct from that patent, as they were at outs. This I remember clearly.

[*That part of the answer expressing the witness' belief, objected to by Mr. Hill, as irresponsive and mere opinion.*]

Cross-Q. 337. Did he, or did he not ask you if you could change his attachment so as to make it work satisfactorily on hilly ground, and if not, what did he say?

Ans. He may have said so at first, but I am positive his words were not to that effect after we talked on the subject a little while. I cannot

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now give the exact words, but he wanted it to be a monopoly in that kind of plow attachment, and free from all claimants. I am impressed at first he did talk differently than he did soon after.

Cross-Q. 338. You say he may have said so at first. Have you any actual recollection whether he did say in fact or not?

Ans. I cannot now recall his words, but I have that impression now that he had some unmechanical idea on that subject.

Cross Q. 339. Did he ask you with reference to that idea, whatever it was, to get a patent on it for him, or to bring your inventive skill to bear upon it to assist in working it out?

Ans. I think he simply said it would be a good thing if it could be made, or words to that effect. I do not remember that we talked about patent then at all, because the invention was not made yet. He simply said he had money in sulky plow, and would like to get it out, and if I could help him it would be a good thing for us both.

Cross-Q. 340. And that was what started you to work as an inventor, to devise an improvement, was it?

Ans. I believe it was. I had no special liking for it, and did it as a matter of duty.

Cross-Q. 341. But you do not remember that he, in fact, asked you to get up a change in the invention which would make it work, do you?

Ans. No, sir; in no particular way at all; only in a general way.

Cross-Q. 342. Did he ask you to go to work on it as an inventor, and make some change in it to make it work, or did he not?

Ans. Not at that time.

Cross-Q. 343. Did he at any time, if so, when?

Ans. He did, soon after the issue of their patent, ask my advice on some changes in the attaching clips of that patented device to avoid clogging, and I freely suggested a change which, I believe, he adopted. I never saw it, but he said it was an improvement the next time I saw him; that he had tried it. That related only to their attachment.

Cross-Q. 344. Is that all that he ever asked you to do on the thing as an inventor?

Ans. No, sir.

Cross-Q. 345. Well, what else did he ever ask you to do on the thing as an inventor?

Ans. As I stated before, he first came to me with an unmechanical idea that the attachment might be adapted for hilly ground, and asked me if I couldn't get it up. After a little conversation, I having declared that it was impossible, I believed, to adapt the thing as a change merely of their sulky attachment, he concluded, it would be better to have it all new if it could be done in a simple way.

Cross-Q. 346. And did he request you to get up one all new, as an inventor?

Ans. I don't remember; only I remember stating I would study on the matter, and see if it could be done. I had no clear idea at that time, yet.

Cross-Q. 347. Then you don't remember whether he asked you as an inventor to make an improvement that would remedy the difficulty on hilly ground, or whether you volunteered to do it, do you?

Ans. As much one way as the other. I partly volunteered after he talked about the necessity of the case.

Cross-Q. 348. Is it not an unusual occurrence for an inventor to fall back upon his patent solicitor to make his inventions work practically?

Ans. It has often occurred in my practice, and almost unavoidably.

Cross-Q. 349. When Mr. Kutz returned, after you had filed your sole application in the Patent Office, did you volunteer information to him of your action and reasons?

Ans. Yes, sir.

Cross-Q. 350. Without waiting for him to make any inquiries?

Ans. That is what I mean.

Cross-Q. 351. Are you a mechanical draftsman, and able to make drawings, such as are received by the Patent Office in connection with applications for patents?

Ans. Yes, sir; I have made such.

Cross-Q. 352. You are also able to make models for the Patent Office, are you not?

Ans. I have made some.

Cross-Q. 353. Do you generally get up your own models and drawings in your applications for patents on your own inventions?

Ans. Yes, sir; in most cases. Recently I have sometimes employed draftsmen in Washington to renew my drawings after an informal drawing made by me had been admitted provisionally by the office until the case was passed by the examiner to issue.

Cross-Q. 354. When you prepared Drawbaugh's application on magnetic clock, did you make the drawings?

Ans. I did; an informal drawing.

[Recess for dinner, until 2, P. M.]

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July 21, 1882, 2, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Cross-examination of Theophilus Weaver, by Mr. Hill, continued:

Cross-Q. 355. How many of your inventions, and which ones, ever paid you a profit over and above their incidental expenses, including the expenses of the patent?

[*Question objected to by Mr. Storrow, as immaterial and frivolous.*]

Ans. The clothes-hook and line-holder, 1868; safety horse-hitch, 1868; corn-sheller, July 6, 1869; corn-sheller, August 24, 1869; latch and lock, October 26, 1869; hand corn-sheller, April 12, 1870; sash-holder, August 19, 1873; carriage seats, October 25, 1881. Those are all I can remember—some more, some less remunerative.

Cross-Q. 356. Referring to your answers to the seventy-eighth and ninety-sixth interrogatories, were you a man of considerable financial means, or have you always been a poor man?

Ans. I have always been able to meet life's emergencies, and I cannot say that I have been a poor man. I do not know that I owe a man a dollar to-day, and nearly always have had income from some source or other; and my credit has been as good as means or ability, at times.

Cross-Q. 357. Do you own the house you live in, and the shop you work in?

Ans. It belongs to my family, not to me.

Cross-Q. 358. In 1878, when you say Drawbaugh had a talk with you about his telephone, upon what amount of property were you assessed for taxes, taking its assessed value as the standard?

Ans. None.

Cross-Q. 359. Answer the same question for each year from 1866 down to 1878?

Ans. The same, with the exception that I paid income taxes, at times, on my business, and government licenses, both as dealer and as solicitor.

Cross-Q. 360. Have you never, when applying for a patent on your own invention, and when the patent was allowed and was ready to issue on the payment of the final government fee of twenty dollars, found yourself financially unable to pay the twenty dollars within the six months allowed by the Patent Office therefor, and for that reason allowed the application lapse?

Ans. No, sir.

Cross-Q. 361. Have you never stated to anybody that you had allowed any of your applications to lapse, because you had been unable to pay the second government fee within the time allowed therefor?

Ans. I regard this answer as superfluous, in view of my last answer. But for the sake of ascertaining who would have the cheek to swear to the contrary, I answer, I have not.

Cross-Q. 362. Have you ever, in the case of applications for patents on your own inventions, found yourself obliged to get the time for paying the final fee extended, or to renew the application, by reason of your inability to pay the fee within the time allowed?

Ans. No, sir; and I have never renewed an application of my own.

Cross-Q. 363. Didn't you say, right here in this room, since this deposition has been commenced, substantially these words: "I once lost a patent by not paying the final fee in season." And then added: "I was hard-up at that time?"

Ans. If my recollection serves me right, I showed a letter of grant here on a car-coupler, and also a letter from Hon. Ellis Spear, Commissioner of Patents, in which it was stated that the final fee came too late to be applied for the issue of that patent. I remarked, in that connection, that the rules of the office then were different from what they are now. That the final fee was received within the six months, according to law. But the rules were such, that I was deprived of my patent. I was not hard-up at that time, as I can remember now, and for that reason the latter part of the question is a gratuitous, left-handed compliment. There was a stringency in the rules only, and not in my pocket. And my words must have been misconstrued in a dishonorable manner by the persons in this presence who so allege.

Cross-Q. 364. What did you say in that connection, about being hard-up?

Ans. I don't know that I used the phrase at all.

Cross-Q. 365. After exhibiting the letter, did you not turn partially around, and say these exact words: "I was rather hard up at that time?"

Ans. No, sir; this illustrates how language may be perverted. I did say something else. I said there was a hardship in that case; and so there was, that I should be deprived in that manner, and be compelled to renew my application. The last part I have now added.

Cross-Q. 366. You did not renew said application, did you?

Ans. No, sir.

Cross-Q. 367. When you exhibited the letter here, and made the remark about losing your patent, some person present informed you that you might have saved it, even under those circumstances, by renewing it, did he not?

Ans. I believe you stated that; a fact which I did not know, at least at that time, and, perhaps, not until you stated it; but I had thought since the rule was changed, that if the final fee was received within the six months—I had before intended to write to the commissioners, and ascertain about that matter.

Cross-Q. 368. Did you not know that it was always the practice at the Patent Office to permit a mere formal renewal without any extra charge or fee, in cases where the final Government fee was received at the Patent Office within six months from the date of the allowance of the patent, but not in season for the actual making and signing of the patent within the six months?

Ans. I did not.

Cross-Q. 369. Have you been employed by the complainants in connection with this suit?

Ans. No, sir; only by way of a few days' work, which I did some time ago as a citizen.

Cross-Q. 370. Were you paid for that work?

Ans. Yes, sir.

Cross-Q. 371. How much?

Ans. I believe it amounted to about fifty or sixty dollars, minus my expenses.

Cross-Q. 372. When were you first employed for that work, and when did you do the first work under that employment?

Ans. At first I was not employed at all, and did some part by way of accommodation. Then the party took up some of my time in looking up some matters, and he said he would pay me for my time and trouble, or labor. I think that was all some time before the injunction in this case.

Cross-Q. 373. Who was that party whom you refer to?

Ans. I do not know him, personally. He named himself Fred. Weeks at the time, and thereafter.

Cross-Q. 374. Did you ever learn, or hear that that was a fictitious name, and not his true name?

Ans. I did. Sometime afterwards.

Cross-Q. 375. Did he profess to be acting for the complainants in this case?

Ans. Not at first.

Cross-Q. 376. Did he at any time. If so, how long after you first had communication with him on the subject of the case?

Ans. I cannot tell. It was sometime afterwards. It may have been a month or two.

Cross-Q. 377. Did you ever do any work, of any kind, for the complainants, since the granting of the preliminary injunction in this case?

Ans. Not to my recollection. I cannot fix the time of the injunction now. I am informed, now, that it was in November, 1880. I cannot recollect of doing anything since that time, except trying to look up matters that I might possibly be called on to answer, if summoned as a witness.

Cross-Q. 378. Did you go to work looking up matters at the request of complainants. If so, how long ago did they make that request of you?

Ans. I cannot say that they made that request. They simply inquired of me to know what I could testify to. The other part was voluntary, on my part.

Cross-Q. 379. How long ago did they first inquire of you what you could testify to?

Ans. I cannot tell. It was a long while ago. Perhaps a year and a half, or more. It may be less than that, not much.

Cross-Q. 380. Was it before or after the preliminary injunction in November, 1880?

Ans. All that I can remember before that, was what occurred between me and the so-called Mr. Weeks. I know this, because I didn't expect that my name would appear in the injunction papers.

Cross-Q. 381. Did it appear there?

Ans. Yes, sir; I was since shown the printed volume of papers on the motion for an injunction, in which my name appears in connection with file wrappers, as attorney, when some of the Drawbaugh patents were taken out.

Cross-Q. 382. Why didn't you expect that your name would appear in the injunction papers?

Ans. I didn't know that patents on mere mechanical devices, or such as I was attorney for, had any connection with, or relation to, patents on telephones. I have learned differently since.

Cross-Q. 383. Have you ever heard what was Weeks' true name?

Ans. Yes, sir; I believe it is Harris. I can't give his initials now.

Cross-Q. 384. Where does he live?

Ans. At Laconia, New Hampshire.

Cross-Q. 385. Where did he tell you he lived?

Ans. There, as stated.

Cross-Q. 386. Did he give his name as Weeks, of Laconia, New Hampshire?

Ans. No, sir; only Fred. Weeks.

Cross-Q. 387. Did he ever give you any other residence that Laconia?

Ans. No, sir; but I inferred he lived somewhere not far from here.

Cross-Q. 388. When the papers for the preliminary injunction were preparing did you request that your connection with this case should not appear in them?

Ans. No, sir.

Cross-Q. 389. How long did you render assistance in behalf of the complainants before you became employed by them?

Ans. I was never regularly employed by them; only I assisted now and then when the said Weeks (*alias* Harris) wanted me to do work for him.

Cross-Q. 390. What kind of work did you do for him?

Ans. I ascertained, by conferring with certain parties, what data certain parties could and were willing to swear to in some of the affidavits. In some cases Mr. Weeks had gathered the data, and I arranged them in a form and submitted them to him for his approval before they were submitted to the parties who afterwards swore to them. I went to see several parties and had them appear—only by request—before a notary, and there take their depositions, Mr. Weeks all the while having the control or supervision over everything which I did. At one time I went to Carlisle, Cumberland county, and examined the records to ascertain how Daniel Drawbaugh stood as it regards property owned by him. At one time, later I believe, I accompanied Mr. Weeks, or Harris, to Mechanicsburg, and from thence out to Jacob S. Shopp's and back. I also, at one time, went with Mr. William R. Gorgas to Mechanicsburg to examine the account books of the Drawbaugh Manufacturing Company, then in charge of Dr. Mosser there. I also, at one time, went to Camp Hill, Cumberland county, and interviewed some parties there. This is about all I can recollect.

Cross-Q. 391. What parties at Camp Hill did you interview with regard to this case?

Ans. Jacob Kline and J. Addison Moore.

Cross-Q. 392. You didn't take their affidavits, did you?

Ans. No, sir.

Cross-Q. 393. The fact is, that you assisted in preparing the complainants papers for their motion for preliminary injunction; is it not?

Ans. They were to be used for legal purposes, but I didn't know at that time that they were to be used for an injunction, nor for any other particular purpose, only for legal purposes.

Cross-Q. 394. Did you inform Weeks what you knew about the Drawbaugh telephone?

Ans. Yes, sir; perhaps not all I knew.

Cross-Q 395. Did you inform him of the conversation which you say, in your ninetieth and ninety-first answers, took place between yourself and Mr. Drawbaugh in your private office, he alone being present with you?

Ans. Yes, sir; we talked somewhat on that subject.

Cross-Q. 396. Did you give him the substance of the information which you have given us in your ninetieth answer, commencing with the words: "In one of those private interviews, then, he alone being present with me," and ending with the end of said ninetieth answer?

Ans. Yes, sir; perhaps not fully all that part relating to phonographs, that I have there stated, but pretty near the same matter otherwise.

Cross-Q. 397. Did you make an affidavit yourself for Mr. Weeks in that connection, or at any time before the motion for preliminary injunction was granted?

Ans. No, sir.

Cross-Q. 398. Did you prepare or write any of the affidavits that are contained in that printed book of papers relating to the complainants motion for preliminary injunction, which you say you have seen?

Ans. Yes, sir; but they were somewhat revised by Mr. Weeks aforesaid.

Cross-Q. 399. Designate each of those which, in substance, you prepared or wrote?

Ans. Affidavit of W. R. Gorgas, pages 167 and 168; affidavit of Frederick U. Worley, pages 172 and 173; affidavit of Isaac Lloyd, pages 173 and 174; that is all.

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Cross-Q. 400. Did you take any other affidavits which do not appear in the printed book, or assist in taking or preparing any?

Ans. The only other one I can recollect is that of Jacob Shopp, which I assisted in taking only so far as interviewing him was concerned, at his home.

Cross Q. 401. Was Mr. William R. Gorgas present when you wrote his affidavit?

Ans. The form was first written and submitted to him at his home, and he there indicted certain changes in it, and stated, that in regard to the figures for financial statements therein contained, he would have to go to Mechanicsburg first and refer to the account books, and that he would then give me a correct statement that he would be willing to be qualified to. We went over there to Mechanicsburg, and repaired to Dr. Mosser's together, and he gave me a written statement, and on my return, I re-wrote the affidavit, putting it in form and containing the matter he intended it should. It was then submitted the second time to him, and he was satisfied with it, and qualified to it, as it now appears in that book.

Cross-Q. 402. Did you examine the account books at Dr. Mosser's with him?

Ans. I did. Perhaps not as fully as he did.

Cross-Q. 403. Was Mr. Worley's affidavit prepared in his, Mr. Worley's, presence?

Ans. Yes, sir; it was first submitted to him at his home, in a certain form, and, I believe, re-written afterwards, embodying what he desired should be changed, and worded as he afterwards swore to it, and as it now appears in that book.

Cross-Q. 404. Was Mr. Lloyd's affidavit written and prepared in his, Mr. Lloyd's presence?

Ans. Yes, sir; in that sense. It was composed in his presence, and put in that form in which he desired it should be, and in which form it was afterwards sworn to, and now appears in that book.

Cross-Q. 405. When you went to Mr. Gorgas to procure his affidavit, or the materials from which to make out his affidavit, did you represent to Mr. Gorgas that you came as a friend of Mr. Daniel Drawbaugh?

Ans. No, sir.

Cross-Q. 406. Did you represent to Mr. Gorgas that you came in the interest of parties whose interests were adverse to Mr. Drawbaugh in the matter of the telephone?

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Ans. Not exactly in that way, only stating that what he swore to might be used against Mr. Drawbaugh in some legal proceeding.

Cross-Q. 407. You stated that to Mr. Gorgas, did you?

Ans. Yes, sir; I emphasized the word *might.* I did not know, for sure, whether they *would* be used, at that time.

Cross-Q. 408. Didn't you give him to understand that the affidavit was intended to be used on behalf of Mr. Drawbaugh?

Ans. No, sir.

Cross-Q. 409. When you interviewed Mr. Jacob Kline and Mr. J. A. Moore, at Camp Hill, as you have testified, did you represent to those gentlemen, or either of them, that you called upon them as a friend of Daniel Drawbaugh?

Ans. I don't know that that question was asked me by Captain Moore, or whether I said anything to him about it. Mr. Kline pressed me, by questions, to find out on which side I was, and as he didn't appear to know anything of importance about the matter in controversy, I think I didn't fairly tell him on which side I was, but meant to fairly tell him in case he had knowledge, or to the effect that his knowledge might be used against Drawbaugh.

Cross-Q. 410. Then you didn't go to Captain Moore or Mr. Kline with the statement that you were a friend of Mr. Drawbaugh, and didn't make that statement to either of them, did you?

Ans. I don't recollect. Such might have been inferred, I think, only by inference, and not by my words to them.

Cross-Q. 411. When you visited Mr. Shopp, did you tell him that you were a friend of Daniel Drawbaugh?

Ans. I might have said that as a man I was a friend to him, but as a party, or as it regards the knowledge which he had or would give, might be used against him.

Cross-Q. 412. When you visited Mr. William R. Gorgas, did you tell him that you were a friend of Daniel Drawbaugh?

Ans. I did not say that I was not a friend to him, as a man.

Cross-Q. 413. Did you tell Mr. Gorgas that you were a friend of Mr. Drawbaugh, or did you not?

Ans. I have no recollection that the question was raised by him, or that any statement to that effect was made to him.

Cross-Q. 414. Did you tell Mr. Shopp that you were a friend of Mr. Drawbaugh, or did you not?

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Ans. Mr. Shopp was sufficiently clearly informed by our talk and manner that his information was to be used against Mr. Drawbaugh.

Cross-Q. 415. (Question four hundred and fourteen repeated.)

Ans. It appears to me that there was talk that in regard to Drawbaugh, as a man, I was friendly, but that the information was to be used against him.

Adjourned until July 22, 1882, at ten, A. M.

JULY 22, 1882.

Examination resumed pursuant to adjournment.

Present, same counsel.

Cross-examination of Theophilus Weaver, by Mr. Hill, continued.

Cross-Q. 416. What did Mr. Harris, *alias* Weeks, give you as his address afterwards, after he admitted his true name?

Ans. L. B. Harris, Manchester, New Hampshire.

Cross-Q. 417. Please state as nearly as you can the time of year, the month, and part of the month, in which you first were approached by anybody in the interest of the complainants with reference to this suit?

Ans. I cannot tell now exactly, but it must have been in the first part of September, 1880, when I had interviews with Mr. Harris, then known as Mr. Weeks, concerning matters pertaining to affidavits; but I had interviews with him a little while before that, when, as I said before, I gave him some information in conversations at my place.

Cross-Q. 418. How long before that were those first interviews with Mr. Harris, *alias* Weeks?

Ans. I cannot tell. It may have been the last week in August.

Cross-Q. 419. Did Weeks, or Harris, tell you how long he had been around here on that business before he interviewed you?

Ans. I either learned from him, or from some other source, probably from him, that it was about four weeks. I did not find that out during the time of the first interviews I had with him.

Cross-Q. 420. When Weeks, or Harris, gave you his true address, as you have just testified, why did he give it to you; was he going away, and was it to enable you to correspond with him?

Ans. Yes, sir.

Cross-Q. 421. Did you have any correspondence with him?

Ans. Yes, sir.

Cross-Q. 422. Will you please produce all the correspondence that you had with him, or all that is in your possession, or within your control, relating in any way to this controversy, or to any proceeding or matter having any connection therewith, and if you have any copies of it, or of any parts of it where you have not the original, please produce the copies?

Ans. I have no copies of my letters to him, and only a few from him to me, to my knowledge, but will do as requested in the question.

Cross-Q. 423. Did you interview Theodore Grissinger or Jacob H. Grissinger, with reference to this controversy, in the summer or fall of 1880?

Ans. No, sir.

Cross-Q. 424. Did you give Mr. Weeks or Harris information about the Grissingers, which resulted in his procuring their affidavits?

Ans. I am not sure but that he knew of them and their relations to Mr. Drawbaugh before he came to me, but I believe we did talk about them.

Cross-Q. 425. Did you inform him of any hostility or hard feeling between the Grissingers, or either of them, on the one hand, and Mr. Drawbaugh on the other hand?

[*Objected to by Mr. Storrow as an assumption of something not proved or testified to by anybody.*]

Ans. I believe not.

Cross-Q. 426. Was the question of their hostility or unfriendliness to Mr. Drawbaugh discussed or talked about between you and Mr. Weeks?

[*Same objection.*]

Ans. I cannot recollect that it was.

Cross-Q. 427. You have mentioned in your testimony the names of several persons from whom you and Mr. Weeks or Harris procured affidavits, and of several other persons whom you interviewed with relation to this case. Did you give him the names of any other persons who you thought would testify against Mr. Drawbaugh's claims. If so, who are they

[*Objected to by Mr. Storrow as not proper cross-examination, and having a different and obvious purpose.*]

Ans. I did give him the name of one other person, but not specially for that purpose, but simply as a party to whom he could refer for information. That was in one of our first interviews. That party is James P. Matthews, of Baltimore, Md., formerly connected with the *Baltimore American* who, I was aware, had written and printed some statements which appeared in that paper.

Cross-Q. 428. When and how did you become aware of that fact?

Ans. I cannot tell; but I think it was communicated to me first by J. W. Moffitt; but I had brought it up one time or other, and talked it over with Mr. Drawbaugh himself, not knowing, however, then that Mr. Matthews had referred to anything in that article but the magnetic clock.

Cross-Q. 429. When did you bring it up and talk it over with Mr. Drawbaugh himself, and where?

Ans. I cannot tell precisely; it may have been during the exhibition of his clock here in Harrisburg, in 1878.

Cross-Q. 430. Was it at the private interview, he alone being present with you, about which you testified in your ninetieth answer?

Ans. I have no recollection of it in that connection. It appears to me it was before that. We had at one time a conversation about the Gary motor, and about Mr. Drawbaugh being the prior inventor of that, or claiming to be; and it appears to me Matthews was then mentioned in connection with another party, who had been at his shop to take notes on his invention in magnetic clocks, whose name I never heard mentioned. I cannot say that that was the first time I heard Matthews' name mentioned.

Cross-Q. 431. In the conversation between you and Mr. Drawbaugh about the Matthews article, did you have the article present?

Ans. No, sir.

Cross-Q. 432. Did you understand that it had then been published?

Ans. Yes, sir; a good while before that.

Cross-Q. 433. How long?

Ans. I can't tell. My recollection is, no time was mentioned.

Cross-Q. 434. Where did that conversation take place, and who was present?

Ans. I have no distinct recollection of it. It may have been at my place. The only thing I think was talked of in connection with it was the magnetic clock, and it may be, another party was present, but I can't re-call who. Dr. John W. Moffitt often called at my place; it may have been he.

Cross-Q. 435. When you and Mr. William R. Gorgas inspected the account books at Dr. Mosser's, as you have testified, was a statement in writing drawn up from said books, exhibiting the credits and debits of Mr. Drawbaugh ?

Ans. It appears to me Mr. Gorgas referred mainly to the credits in Drawbaugh's account, and prepared a statement himself on a piece of paper, which he handed me, and by which I was guided in making the statement in his affidavit, composing it accordingly.

Cross-Q. 436. Do you mean credits in favor of the company against Drawbaugh, or credits in favor of Drawbaugh against the company ?

Ans. I mean the latter.

Cross-Q. 437. Did you examine the items that Mr. Gorgas gave you and compare them with the entries in the books?

Ans. Not particularly. I left that to Mr. Gorgas himself, to satisfy his own mind.

Cross-Q. 438. Why did you go with Mr. Gorgas to examine the books. Couldn't you trust him to do it himself without your presence?

Ans. I believe the main object was to gain a little time and to be sure that he would attend to it; he being a member of the bank in Mechanicsburg, and having many engagements to attend to, I went with him to have that affair attended to certainly. I meant by "credits," in my answer to cross-question four hundred and thirty-six, the amount which Drawbaugh received from the company.

Cross-Q. 439. Did you incorporate the written statement that Mr. Gorgas gave you bodily into his affidavit, or did you select such parts as you desired and incorporate them, in substance, into it ?

Ans. All the data were bodily incorporated, without excluding any parts thereof, he remarking that he could bring counter statements, if desired, afterwards; which I said, of course he could, if he saw proper ?

Cross-Q. 440. That who could bring counter statements ; Gorgas or Drawbaugh ?

Ans. Mr. Gorgas, in favor of Drawbaugh.

Cross-Q. 441. Then, for the purposes of that affidavit, you desired only a one-sided statement, which should present the account as strongly as possible against Drawbaugh without showing the matter in his favor or the counter statements ; did you ?

[*Question objected to by Mr. Storrow, as improper and as assuming.*]

Ans. No, sir ; if such is the inference, as now intimated by this question, I was misled in my answers before by the obscurity of the question that preceded, for the important item extracted from the account by

Mr. Gorgas was the balance in that account in favor of Mr. Daniel Drawbaugh, over and above charges against him, amounting to, as I recollect, about eight hundred dollars; but Mr. Gorgas stating that he might bring counter statements from other sources than in the accounts which we examined.

Cross-Q. 442. As you prepared Mr. Gorgas' affidavit, you made it contain the following statement, which I quote from it: "We," (meaning the Drawbaugh Manufacturing Co.,) "were to pay Daniel Drawbaugh at the rate of three dollars per day for his services. But when the business proved unsuccessful in 1870, we settled with him by compromise in that year, at two dollars and fifty cents per day. His wages then amounted to eight hundred and seventy dollars, a few hand-tools, and a second-hand lathe being included in said amount, which were bought of him. The business was discontinued, and the machinery, stock, and right offered for sale, which was effected in 1873, when we sold out the whole concern to Hauck Bros. & Co., of Mechanicsburg, Pennsylvania, at seven thousand dollars." Did you not know that that eight hundred and seventy dollars was not a balance at all, but merely an amount allowed Drawbaugh for wages, tools, and lathe, and off-set on the same books by the charges against him for installments due from him to the said company?

Ans. I have no recollection that the books were made to have such showing against Drawbaugh at that stage of the accounts?

Cross-Q. 443. Did you not know that the books so showed?

Ans. No, sir.

Cross-Q. 444. If you thought at the time that the eight hundred and seventy dollars referred to was a clean balance shown by the books to have been due or paid to Drawbaugh, why did you not make the affidavit say so, instead of using the peculiar and misleading phraseology which you actually did employ?

[*Mr. Storrow objects to the assumption that there is anything peculiar or misleading in the phraseology, and further objects that the question is misleading in quoting part of the affidavit and not the whole.*]

[Mr. Hill offers in evidence, in connection with the question, and by reason of Mr. Storrow's objection, a full copy of said affidavit taken from pages 167 and 168, of complainant's moving papers on motion for preliminary injunction, but only for the purpose of showing what the entire affidavit was, without admitting any of its statements to be true, and said copy of the affidavit will be attached to the record of this case, and marked "Exhibit, copy of Gorgas affidavit."]

[Mr. Storrow objects, that the question as now modified imputes that an affidavit filed as a part of the moving papers in this case, was expressed in such language as to present a misleading view of transactions between Drawbaugh and the manufacturing company, and therefore calls attention to the fact that an account of the transaction, given by Mr. Drawbaugh himself, under oath, was filed by the complainants as a part of the moving papers in the case, and printed on pages 177 *and* 178.]

Ans. The reason why, appears by inference, when I state that my only motive in that affair was to present a fair and substantiated exhibit of Drawbaugh's resources or income, without colored phraseology. And Mr. Gorgas, likewise, desired to be accurate, as he stated, in his statement to which he swore, and of which he approved at the time.

[Recess for dinner, until 2, P. M.]

JULY 22, 1882.

Examination resumed pursuant to adjournment.

Present, same counsel.

Cross-examination of Theophilus Weaver, by Mr. Hill, continued.

Cross-Q. 445. From Mr. Gorgas' affidavit, it would naturally and reasonably be understood that Mr. Drawbaugh, in 1870, received the sum of eight hundred and seventy dollars in cash from the Drawbaugh Manufacturing Company, whereas, from the said books of the company, it appears that he did not, but that his labor was balanced against his debts due from him to the company. Do you think the affidavit presented a fair statement of his resources in that particular?

[Objected to by Mr. Storrow, that the question does not correctly represent the affidavit, which states a settlement, but does not state whether part had been paid before, or part then, or how. And does not correctly state the books set forth in the deposition of William L. Gorgas. And finally, that the total amount paid to him, as stated in the affidavit—if there be therein a statement that eight hundred and seventy dollars were paid to him—is not materially different from the amount shown by the exhibition of the books, as stated in William L. Gorgas' deposition, particularly in answer thirty-three.]

(Mr. Hill refers to answers twenty-two and twenty-three of the deposition of William L. Gorgas, pages 679 and 680 of defendant's printed record.)

Ans. That would not affect his resources in the least, no more than his debts anywhere else.

Cross-Q. 446. What object had you in putting a statement of his pecuniary resources in that affidavit?

Ans. I cannot say that I had any definite object, except to show that he was earning money, and deriving means from various sources, thus making a showing that he was not a destitute man, in that period of time, but had considerable income, or at least apparently so, so far as it could be gathered.

Cross-Q. 447. And you did not take the trouble to ascertain whether that apparent income was not actually canceled, as fast as it accrued, by his dues to the company, did you?

Ans. No, sir; not particularly.

Cross-Q. 448. Are you the only patent solicitor who has had a business office in Harrisburg or its vicinity, from 1875 down to 1879, or during any part of that time?

Ans. During some parts of the time at least, I was the only one, to my knowledge. There were others, at times, who advertised to do business of that kind, but I do not know how much they accomplished. They mostly soon abandoned the effort, and I was left alone in that business without advertising.

Cross-Q. 449. How many others do you remember of attempting to do such business here within that time, and what were their names?

Ans. I cannot give their names. One represented himself as having been an examiner in the Patent Office. and I think it was in that time, also, that Robert Snodgrass, Esq., gave notice that he would attend to business of that kind, or have it attended to. There was, also, in the summer of 1879, an individual stopping here, and may be here yet, a Mr. Stouffer, if I recollect correctly, who had been in the solicitor busiin Washington, D. C. There is a Captain Smith who professes to prepare applications for patents, and has for some years placarded his name at hotels for that same business. I know not whether he has done any business alone, or not.

Cross-Q. 450. How long has Captain Smith placarded his business, as you say?

Ans. I think I saw it placarded about the summer of 1879.

Cross-Q. 451. Do you not know that Mr. Snodgrass only received and forwarded applications to attorneys in Washington?

Ans. I know he did that much, but did not know really to the contrary but what he might have made some applications alone, or by having some draftsman in the city assist him. I never inquired of him.

Cross-Q. 452. After you took out your dumping wagon patent of September 14, 1875, did you do any further patent business for Hamilton Baily, of Harrisburg, or did he thereafter employ other attorneys about his patent business?

Ans. Yes, sir; I did some other business for him—took out some patents, worked on models for him—I believe, as late as last year; but he has also employed others.

Cross Q. 453. In your twenty-ninth and thirtieth answers, you say you saw Mr. Drawbaugh at the State fair in the year 1868, and again in the year 1869; where were those State fairs held?

Ans. They were held about two miles north of the city limits of Harrisburg.

Cross-Q. 454. Do you know whether he was exhibiting there on his own account, or for the companies that owned the inventions which he exhibited?

Ans. I inferred he was doing both in the 1868 fair.

Cross-Q. 455. Did you know anything about it, except by mere inference?

Ans. That and the fact that mention in the paper, at that time, so reported him.

Cross-Q. 456. What paper?

Ans. I believe it was the Harrisburg Patriot.

Cross-Q. 457. In answer twenty-nine you say, that at the State fair of 1868, you saw him take a roll of money, bank-bills, about two or three inches in diameter, from his pocket; do you know whose money that was?

Ans. I only know that he had possession of it.

Cross-Q. 458. You say, in answer eighteen, that you visited Drawbaugh's shop at Eberly's Mills in the year 1867, some time after August. In answer forty-nine, you say you visited his shop in 1873. Were you at his shop at any time between those two visits?

Ans. I cannot re-call any visits. I may possibly have visited his shop then.

Cross-Q. 459. In answer fifty-three, you say you were at his shop in

1875. Did you visit his shop at any time between said visit of 1873 and said visit of 1875?

Ans. I cannot re-call any visit in that time, nor now very clearly any visit in 1875. I must have visited his shop sometime between 1873 and 1876.

Cross-Q. 460. You say you were at his shop about March 1, 1876, when you took the inventory. When were you next again at his shop after that?

Ans. If I recollect correctly, it was next day. It took us several days to take the inventory.

Cross-Q. 461. In answer sixty-four, you say that the negotiations with which that inventory was connected, fell through. How soon after the inventory was taken did the negotiations fall through?

Ans. The papers were not withdrawn from the custody of the attorney who drew them up, for about a week after that, but we disagreed on some of the conditions of the lease soon after the inventory was taken—I should say, of the lease and stipulations on the stock.

Cross-Q. 462. Give the name of the attorney to whom you refer.

Ans. Robert Snodgrass, Esq.

Cross-Q. 463. After those negotiations fell through, when were you next at Mr. Drawbaugh's shop, at Eberly's Mills?

Ans. I cannot surely remember whether I was over any more at all, only I sometimes think I was over the year, or about the time that Jacob Kline's new sewing machine journal was about being made. I had a conference then, I think, with both Mr. Drawbaugh and Mr. Kline, but I am not sure that it was in his shop. It may have been in my office. But that is the last time that I have any recollection of a visit to his shop, if I was there then. I am inclined to think the visit was in my office.

Cross-Q. 464. Then the only visits that you can positively remember of making at his shop, were the visit of 1867, the visit of 1873, and the visits during your negotiations with the axle company, about the beginning of March, 1876. Am I correct?

Ans. You are correct, if you include two visits while making the eraser-holder, in 1867.

Cross-Q. 465. How many times were you at his shop, pending the negotiations with the axle company, about March 1, 1876, and through what length of time did those particular visits extend?

Ans. Only during the first and second days of March, both days being largely occupied with taking the inventory at the company's shop. The day before—I believe it was Feb. 29th—we had taken the inventory at Mr. Grove's office.

Cross-Q. 466. Why did those negotiations with the axle company fall through?

Ans. It was on account of the disposal of the old stock on hand. A misunderstanding arose in this way. I had understood I was to be given said stock in charge, with security to run it out on royalty when manufactured, and was to have the use of the machinery under a lease; but when we came to close the stipulations on the stock, some members of the company then shaped that part of the contract in such a way that it amounted to an actual sale to me on a short time, so that I would have been stuck for the unuseful old stock, which I could not manufacture or dispose of to advantage. I objected to come under that arrangement, and the provisional assignment of the one fifth interest in the Kline patents to me, which had been drawn up and left in the custody of said Snodgrass, Esq., I did not lift, the consideration in it having been a hundred or more dollars, which the company still owed me for services.

Cross-Q. 467. In your answer ninety, you have given a statement of an alleged conversation with Mr. Drawbaugh in a private interview, he alone being present with you. Where was that interview?

Ans. In my office, 119 Paxton street, Harrisburg, Penna.

Cross-Q. 468. How long did it continue?

Ans. It may have been about an hour.

Cross-Q. 469. Have you testified to all that Drawbaugh said to you about the telephone at that interview?

Ans. It is quite likely there was more talk on that subject than I have embodied in my answers to questions.

Cross-Q. 470. State anything else that you remember that he said to you about telephones at that interview, which you have not already testified to?

Ans. It occurs to me that he stated that about the time that he gave up experimenting, the country people had laughed at him a great deal and made light of him; that he was getting beside himself, or something to that effect, to experiment on things of that kind, and that he had given it up, and hadn't done anything at it for a long while.

Cross-Q. 471. Have you now testified to all that you can remember that he said about telephones at that interview?

Ans. I have given about the substance of it, only I remember we had some talk of what he had really done and accomplished, or rather, failed to accomplish. One thing I recollect; that the unappreciation of the country people was very great against him, he said. The impression left upon my mind was, that what he had accomplished had come as a result after experimenting on the magnetic clock; I never heard him say that he had experimented on telephones before he had experimented on his magnetic clock. He left me under the impression that the experiments on the magnetic clock brought on the other experiment on telephones. At least I never had knowledge that the opposite was the course of his experiments, until I heard it afterwards from others.

Adjourned until Monday, July 24, 1882, at 10, A. M.

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MONDAY, JULY 24, 1882.

Examination resumed, pursuant to adjournment.

Present, Mr. Smith, for complainants, and Mr. Hill and Mr. Jacobs, for respondents.

Cross-examination of Theophilus Weaver, by Mr. Hill, continued.

[*Mr. Hill objects to all testimony as to what the witness didn't have knowledge of, as immaterial, it being only what he did have knowledge of that is evidence.*]

Cross-Q. 472. Referring to that alleged private interview with Mr. Drawbaugh, no one being present, please fix the time of that interview as exactly as you can?

Ans. As near as I can recollect and fix it by a circumstance, it was about a week before the date of the application on the magnetic clock, some time in the month of May, 1878. It was a little after the exhibition of the magnetic clock, here in Harrisburg, closed. I am now informed that the magnetic clock application was filed May 27, 1878. It was about a week before that date, which would make it near May 20, 1878.

(Mr. Hill here puts in evidence a copy, from page 112 of complainants printed moving papers for a preliminary injunction, of a letter purporting to be from Theophilus Weaver, attorney for Daniel Drawbaugh, to the Commissioner of Patents, dated Harrisburg, Pa., Sept. 19, 1878, and being as follows:

" *Hon. Commissioner of Patents.*

DEAR SIR:

Enclosed find P. M. order for fifteen dols., ($15,) the first fee on application for Patent by Daniel Drawbaugh, on Earth Batteries. The model, drawing & specification is forwarded by express. Please admit informal drawing for examination of case immediately, and in due time I will have drawing renewed. This application is supplemental to application by same party on Magnetic Clock, filed May 27, 1878.

Yours truly,
THEOPHILUS WEAVER,
Atty. for Daniel Drawbaugh.

HARRISBURG, PA.,
Sept. 19, 1878.
Exd. J. A. W.
M. McK.")

Cross-Q. 473. The interview to which you refer was about a week before the filing of the original application on magnetic clock, on May 27, 1878, referred to in the last paragraph of the above letter, was it?

Ans. I infer it was that time, or near that time, by a circumstance in the matter, which mainly guides me in fixing the time.

Cross-Q. 474. What was that circumstance? State all the reasons which you have for fixing the date of the interview at that time.

Ans. The drawing was made first in that application, which took me some days to make it. Then I wrote the specification. The latter occupied about twenty pages of legal cap paper. I had to re-write portions, consulting Mr. Drawbaugh, at times, to get his ideas rightly embodied in it. Some of those papers, written in pencil, were lying on my table, and I find on comparison of the writing on the obverse side of the sketch offered in evidence in my testimony, that that language substantially resembles a statement in the specification at about the fifteenth manuscript page of it. I therefore infer that it must have been near the end of the time that I was engaged in preparing that application.

Cross-Q. 475. How long did it take you to prepare the said drawings and specification complete?

Ans. Two weeks, at least.

Cross-Q. 476. Was the application filed immediately after the completion of the specification?

Ans. I think some days elapsed meanwhile before it was sent on.

Cross-Q. 477. How many?

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Ans. I cannot say precisely.

Cross-Q. 478. As many as seven a week?

Ans. I am impressed it was not more than three or four days, but the Grissinger's had to come over, and had a consultation; also, Mr. Shettel, I believe, came over before the papers were sent on.

Cross-Q. 479. Was the application filed as soon as it could conveniently be done after you had completed the specification?

Ans. There was some tardiness about it, I recollect.

Cross-Q. 480. How long was it after the application was sworn to by Mr. Drawbaugh before it was filed in the Patent Office?

Ans. It was probably a couple of days, for I know the Grissinger's somewhat hesitated to pay the thirty dollars which I demanded as my reasonable first fee in preparing such a difficult application.

Cross-Q. 481. How long did it take you to make and complete that specification?

Ans. At least two weeks, as I have already stated.

Cross Q. 482. You stated that it took two weeks at least to prepare the specification and drawing: What I want to know is, how long it took to prepare and complete the specification alone after the drawing was completed?

Ans. It may have taken ten days, and I recollect that the claim wasn't completed until in one of the last interviews with Drawbaugh and his partners, shortly before sending it to Washington. I had written the claim before, and waited some days without seeing the parties, and then when they came together some claims were put in better form, as we thought at the time. The whole time on the specification may have been two weeks, including some days of waiting for the parties to appear.

Cross-Q. 483. Referring now to that private interview, no one else being present, is your recollection of what took place at that interview very full, clear, and distinct, or not?

Ans. I cannot say that it is very full. The main parts were very impressive to me at the time, and I believe they are clear in my mind yet. I remember Mr. Drawbaugh's attitude very clearly as we talked about it. We were standing at a little work-table at the south end of my room or office, both standing, when he said it to me; and most of the conversation occurred right there, until a little while after, we went over to the other end of my room, where my writing table is, and my library, and there he made the sketch which I have offered.

Cross-Q. 484. Were you both standing when he made the sketch?

Ans. My impression is, I sat down, and I believe he made the sketch in a stooping position, leaning on the table. This part is not so clear in my mind. When Mr. Drawbaugh came to my place, still, he was generally on his feet and in motion, trying to explain his ideas in some way better than he could with words, and it was so then, to some extent.

Cross-Q. 485. Do you distinctly remember the fact of his making a sketch at all at that interview.

Ans. Yes, sir; it was such a curiosity and was so related to the conversation growing out of the first part of the conversation, that I always call it up as a part of that conversation. I am not so clear but that that same subject covered by the sketch was again referred to by him at some after time, for a particular reason.

Cross-Q. 486. Did he make more than one sketch at that interview, or only one?

Ans. I do not recollect any more. He did, during the making of the application on magnetic clocks, make other sketches on making natural or permanent magnets, and various other experiments which he had been making to increase the life of a permanent magnet; that is, its period of power.

Cross-Q. 487. Can you swear that that is the identical sketch which he made at that interview?

Ans. Yes, sir; that is his sketch made at that time.

Cross-Q. 488. Was the writing on the back of that paper when he made the sketch upon it, just as now appears?

Ans. Yes, sir; I did not particularly notice what was on the back of the drawing until a few days ago, but I knew it was a part of the blotter or first sketch of that specification long ago, and it is my writing in pencil.

Cross-Q. 489. Did you know at the time of the interview that that paper on which the sketch was made was written over in pencil on the back or obverse side?

Ans. Yes, sir.

Cross-Q. 490. You recollect that fact, do you?

Ans. Yes, sir; I gave him the paper, presenting it upside down for him to write the sketch upon.

Cross-Q. 491. And you swear that that is the identical paper, and the identical writing that was then on it, do you?

Ans. Yes, sir.

[Mr. Hill requests the Examiner to certify here on the record all the writing that appears on the back of that paper.

The Examiner certifies that it is as follows: "force, as then escapement d' becomes a circuit conductor by bearing against part b'', and magnet Q is electrified, and its poles being opposite in kind to those of magnet M, the descent of pendulum from N^2 to C^1, will be accelerated by gravity plus the electric force."

All the above appears in pencil, the erased words having been omitted by the Examiner. On turning the paper upside down, the following words appear written in ink: "beds to have, (one more word too indistinct to be read,) Earth.]

Cross-Q. 492. Was the paper at the time of that interview the same in size as now?

Ans. No, sir; I clipped off parts with a pair of scissors, to be more convenient to put away.

Cross Q. 493. When did you do that?

Ans. I believe it was right after Mr. Drawbaugh left.

Cross-Q. 494. Why did you then deem it of such importance as to carefully file it away, first having clipped off all unnecessary paper?

Ans. Firstly, because it is my habit to do that with important sketches which others leave on my table; secondly, because Mr. Drawbaugh then spoke about taking out a patent on the device in question, or something related thereto, and I deemed it important to preserve the sketch, as I then understood he had not then built his model of it, but had merely made certain successful experiments on it.

Cross-Q. 495. Now, will you please, from your unaided memory, set forth in the order in which it occurred, all the conversation between you and Mr. Drawbaugh at that interview, on the subject of telephones, to the fullest extent of your present recollection, and giving the exact words used, so far as you remember them?

Ans. I cannot give his exact words or mine either at that time, only remembering here and there certain expressions Mr. Drawbaugh did say, edging up to me as we stood at the table at the south end of my room: "I, too, experimented on telephones." "Did you?" said I; "When was that?" "It was long ago. It was before Bell's telephone came out. I was at it a good deal, and I had some results, too. The country people made so much fun of it and me, I gave it up." I made some inquiries then, what he might have done at that early period. The impression left on my mind by his words then, was that he had begun experiment

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ing to make a clock tell the hours audily and loud without striking them in the usual way. I could not understand, then, and never could since, how he could connect a telephone with a clock; but I understood from that conversation that his experiments were with temporary apparatus—something gotten up in a temporary way—that he had nothing to show on hand then like a speaking telephone, by which he could prove that he had ever reduced it to practical form in those early experiments. He stated that his experiments, for whatever purpose in view he had, were not altogether satisfactory, but he had some results. I put it sharply to him, to see if he might have a chance to establish a claim as the first inventor of the telephone. He admitted it was too late; he had given up, and now it was too late, and he would not pretend now to put in a claim for it, but that he still thought that he could get valuable improvements patented. Then came up the main subject, why he came to me at that time; to consult me to take out a patent some time on something related to that sketch on file in my testimony. The impression left on my mind was, that he had obtained no good results from those early experiments from the fact that the country people ridiculed him so much about it, as I thought then, that if he had obtained satisfactorily results, the country people would have applauded him, but I did not state that to him. He seemed to have gotten his mind off that subject of early experiments, and had attached no importance to it himself. Before making the sketch he stated that he had also experimented on something like the phonograph before Edison came out with his invention on it; that he had made various experiments to get good vibrations with plates or diaphragms. That is about all I can remember.

[Recess for dinner, until 2, P. M.]

JULY 24, 1882.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Cross-examination of Theophilus Weaver, by Mr. Hill, continued:

Cross-Q. 496. Have you now stated, in your last answer, all that Mr. Drawbaugh told you about the telephone at that interview?

Ans. He stated the object of that last device, to which the sketch referred, was to improve the delivery of the sound in some way, to make it louder, and that it might be used in connection with a telephone, as well as with a phonograph, if I remember rightly. At any rate, it was to improve the loudness of the clock's announcement of the hours, and before leaving, I believe he requested me to give him a cut or book to show the construction of the human ear, stating that he would like to study the drum of the ear; that is, the tympanum and the little bones near it inside. I searched my library in the dwelling-house, and I found "Hooker's Elementary Physiology," which I gave him. It had a cut which pretty well illustrated the human ear, and he took it along. He never told me he had a telephone as such; not before that time, nor at that time.

Cross-Q. 497. Did you understand from his conversation at that interview, that the only thing he had been working on in the nature of a telephone, up to that time, was the device which he had purposed to use in connection with the clocks?

Ans. No, sir; not quite in that way, because he commenced talking about telephones first without reference to clocks, because he mentioned clocks in the after part of the conversation. I may only wrongly have inferred that, and got telephones and phonographs a little mixed in the after part of the conversation, for I know that he mentioned Bell's name in the first part.

Cross-Q. 498. Then you did, at the time, infer that the telephone which he had been working upon was to be used in connection with a clock, did you?

Ans. In the after part of the conversation. It did not appear impossible, so far as I understood it then, and he talked of both in connection with his proposed improvement. That was a part I didn't fully understand.

Cross-Q. 499. What did not appear impossible, so far as you understood it then?

Ans. That his improvement might be used with a telephone, and both with a clock, but how I could not understand.

Cross-Q. 500. Did he make any sketch or sketches to show how his telephone was constructed, except the sketch which you have put in evidence?

Ans. No, sir; not that I recollect.

Cross-Q. 501. Did he tell you that he had been able to actually talk through his telephone, or been able to get words through it, so as to be distinctly heard and understood through the medium of electrical transmission?

Ans. No, sir; it was only on reproducing some kinds of sound. Speech was not mentioned, except in connection with the new improvement.

Cross-Q 502. What kind of sounds were those mentioned as reproduced, or intended to be reproduced, by it in its original form?

Ans. The kind was not stated. Only to repeat sounds.

Cross-Q. 503. State just exactly what he said about that, as fully and clearly as you remember it.

Ans. I think I have stated the exact words—"to repeat sounds." I am not positive. It is too long for me to remember the exact words.

Cross-Q. 504. Did he say they were to be transmitted or repeated by electricity?

Ans. He didn't mention that. I took it for granted that he was experimenting by the aid of electricity.

Cross-Q. 505. Didn't you ask him whether he had ever transmitted speech by his apparatus?

Ans. I did, when I asked him whether he had a practical working telephone. He said he had nothing to show now or then. That what he had used was only a temporary contrivance. I didn't put the question in the words of your question.

Cross-Q. 506. Did you understand that the improvement that he was then talking of getting up, was one which he had already constructed, or one which he proposed to make? I mean the new improvement referred to in your five hundred and first answer.

Ans. It was one which he had demonstrated successfully. He wanted to get it up in proper form, and have it patented.

Cross-Q. 507. Was that sketch which you have put in evidence made to illustrate that new improvement?

Ans. Yes, sir; that is my recollection of it.

Cross-Q. 508. Was that new improvement to be applied only to clocks, as you understood it?

Ans. No, sir; he said there was a great field yet for improvement in both telephones and phonographs. And this re-calls—I can almost state his words, I think: "They haven't got it yet."

Cross-Q. 509. Did he tell you when he made that improvement, and when and how he demonstrated its success?

Ans. He did not, to my knowledge. I can't remember.

Cross-Q. 510. Did he tell you how long he had been working on that new improvement, or give you to understand how long?

Ans. I can't re-call anything about that matter. It appears to me, or is my impression, that it was a good while. But there is nothing clear about the time.

Cross-Q. 511. Did he tell you how long it was, from the time when he gave up his telephone experiments till he went to work on this new improvement, or give you to understand how long it was? If so, what idea did you get as to that?

Ans. He didn't mention any time, that I can recollect, only that his improvement was in the direction to perfect the telephone, as well as the phonograph. I know I had not considered the phonograph as worth very much, but I then thought he might make some use of it after awhile.

Cross-Q. 512. Did you ask him to bring over his new improvement, and let you see it?

Ans. No, sir; I didn't know that he had it yet, and supposed that he would bring it when he was ready?

Cross-Q. 513. Did you ask him the direct question, whether he had any of his experimental machines that were made before this new improvement, or whether they were in existence?

Ans. I think I did, only in reference to his earlier experiments. He had partly stated that matter already, himself.

Cross-Q. 514. What had he said about it already, himself? Give us as nearly as possible his words, if you can remember them?

Ans. I have already stated, as near as I can recollect, that what he had used was a temporary apparatus, taken apart and put away, and he didn't know whether he could get it together again. It was only to try an experiment, he said. That is all I can recollect of it.

Cross-Q. 515. Did he say that he had given up his telephone experiments before Bell had entered the field, or afterwards?

Ans. I understood it was before Mr. Bell came out with his telephone.

Cross-Q. 516. Was any mention made as to the time when Mr. Bell came out with his telephone?

Ans. I have no recollection of any particular date being mentioned.

Cross-Q. 517. Did he tell you how many different forms of telephones he had gotten up before he gave up his telephone experiments?

Ans. No, sir; he only said he experimented a good deal.

Cross-Q. 518. Did he tell you whether he experimented on the magneto-telephone or carbon-telephone in those experiments of his?

Ans. He didn't specify.

Cross-Q. 519. Didn't you ask him which it was?

Ans. No, sir.

Cross-Q. 520. Did you know the difference between the magneto-telephone and carbon-telephone, at that time?

Ans. I did not; and there is a circumstance which raises a question right here. Late in the fall of that year, probably in November, Mr. Drawbaugh got me to look up some patents, particularly all of Brush's patents, referring to carbon burners and electric lights, and also the patents relating to the vibratory or trembling sign then displayed in Daniel Hamaker's drug-store window, which latter I found covered by the patents of Blowney, in 1876, and patent of Blackmer, in 1878. This leads me to think that was the first time Mr. Drawbaugh ever referred to carbons in connection with his early experiments, except coke, in connection with his earth-battery plates.

Cross-Q. 521. When you asked him about his telephone experiments, I understand you to say that you asked him only about his earlier experiments; is that so?

Ans. Yes, sir; and up to the time of Bell's patent.

Cross-Q. 522. State exactly what question you did ask him on that point?

Ans. I mainly let him talk. He opened the talk, and now and then I put in a word to get him to tell what he had done before. He told it pretty much all of his own accord. I wanted to know what he had done, and what shape he was in, to see if he could substantiate his claim as the prior inventor of the telephone.

Cross-Q. 523. Did he tell you when he first went to work at telephone experiments?

Ans. No, sir; but it was long ago, he said.

Cross-Q. 524. Did you get the idea that it was about the time of Bell's patent, or several years before that time?

Ans. I don't know how long before Bell's patent, but he said that his crude experiments were before Bell came out—a good while before Bell came out.

Cross-Q. 525. Was the date of Bell's patent mentioned in that interview, or anything said about it?

Ans. No, sir.

Cross-Q. 526. Did you at the time of that interview know the date of Bell's patent, or either of them?

Ans. Only the one patent, the Centennial year patent.

Cross-Q. 527. Did he state that he had given up his telephone experiments before the date of Bell's Centennial year patent, or after it?

Ans. Not in so many words, but so it was conveyed to my mind, that he gave up his experimenting before the Centennial year, but what was in Mr. Drawbaugh's mind I cannot tell. I supposed it was commonly understood that Bell came out publicly about the Centennial year.

[*Last clause of the answer objected to by Mr. Hill, as irresponsive, mere opinion, and incompetent.*]

Cross-Q. 528. When he said that he had had some results in his earlier experiments, didn't you ask him what those results were?

Ans. No, sir; he went on and stated them of his own accord.

Cross-Q. 529. Well, what were they, according to his statement?

Ans. He said he had some results in reproducing sounds, only in a general way. He didn't particularly lay stress on what is now known as articulate sounds. He didn't mention speech or words. I didn't know but what they were musical sounds, as he didn't specify.

Cross-Q. 530. And you didn't ask him whether they were musical sounds or not?

Ans. No, sir; I thought that was understood that the telephone was to deal with speech, but speech was not mentioned.

Cross-Q. 531. Did he use the expression—the words—that he had given it up, or some other form of expression, and if so, what?

Ans. That is what he said.

Cross-Q. 532. Did he state why he had given it up. If so, why?

Ans. Both because it wasn't fairly practical or successful, and because he was ridiculed by the country people.

Cross-Q. 533. Give his language, as closely as you can, on that point.

Ans. It is only a general impression I have clear, but it appears to me he said: "I was much opposed, and laughed at by the people. It wasn't altogether successful. I had some results when I gave it up, and now it is too late for me to hope to have any standing or any show. I didn't go far enough. But I still think I could get up some improvements on it. They haven't got it yet."

Cross-Q. 534. When did he say that. When he was standing with you at the south end of the room?

Ans. Yes, sir; before he made the sketch.

Cross-Q. 535. Why didn't you state all that before, when I asked you for all of his conversation. Didn't you recollect it?

Ans. I sometimes recollect things better after I am spurred by questions, but my recollection is not very clear on it yet. That was the tenor of the talk.

Cross-Q. 536. Did you get any impression from his conversation as to how he was led to first make experiments on the telephone?

Ans. Not particularly, only that some way I got the impression that it was after he experimented on clocks. Why I got that, I cannot tell now.

Cross-Q. 537. Did you get the impression that the clock experiments led to the telephone experiments?

Ans. Yes, sir; some way that part of the apparatus was used in the temporary experiments. I may have inferred this.

Cross-Q. 538. Do you mean that part of the clock apparatus was used in the temporary telephone experiments?

Ans. Yes, sir; as he had no instrument, I somehow inferred that he had made an experiment some way with what he had used on the clock, but I have no words that way that I can recollect. He never told me that he had a telephone, at that early time.

Cross-Q. 539. Did you get an impression of what was the purpose or object of that temporary experiment. If so, what was it?

Ans. It was to reproduce sounds.

Cross-Q. 540. Is that the best and fullest answer you can give to that question?

Ans. That is a fair answer, in connection with the statement that Bell's telephone was mentioned. And that he stated he, too, had experimented in that direction, before Bell came out.

Cross-Q. 541. Did you get the impression that that first telephone experiment was in the nature of an attachment to the clock?

Ans. No, sir; only that I knew he was very much absorbed on the clock, in experiments, as I stated elsewhere in the beginning of the testimony.

Cross-Q. 542 and 543. In answers five hundred and thirty-seven and five hundred and thirty-eight, you say you got the impression that a part of the clock apparatus was used in the temporary telephone experiments, did you get the impression that part of the clock apparatus was taken out and used separately from the clock in the telephone experiments?

Ans. He didn't say anything to me about that, but I inferred that was the way that he had made a temporary experiment, at first, or in the early part, but it was only because he didn't appear to have any special instrument left to show what his early experiments were.

Cross-Q. 544. Having inferred that he took out a part of his clock apparatus and used it separately from the clock in his temporary telephone experiments, did you get the impression that that was done for the purpose of improving the clock in any way?

Ans. No, sir; that part came out more distinctly in the after part of the conversation, in connection with the improvement he was about to make.

Cross Q. 545. How do you reconcile this last answer with your four hundred and ninety-sixth answer, in which you say: "I made some inquiries then what he might have done at that early period; the impression left on my mind then by his words was, that he had begun experimenting to make a clock tell the hours audibly and loud without striking them in the usual way?"

Ans. I stated before that I could not understand that part, how the telephone could be used in that connection. Yet notwithstanding that, I did get the impression that either the telephone or phonograph was sought by him to be made use of on his clocks somehow for that purpose; and I had qualified my answer before, that I could not understand how he meant to do so. He tried to explain that to me at the time he made the drawing.

Cross-Q. 546. Is that the best explanation you can give of the apparent discrepancy in your statements?

Ans. I will have to ask those two answers to be read another time, if you please. (The examiner reads them again.) My answers do not preclude the possibility that he still earlier experimented on the phonograph, or something of that nature, in connection with the clock. I don't really know when he claimed first to have experimented on the phonograph, only that he claimed to have done it before Edison.

Cross-Q. 547. The first experiment that he mentioned to you was the experiment he made in connection with the clock; was it?

[*Mr. Smith objects to the assumption of the question, that Mr. Drawbaugh had described to the witness experiments with the telephone in connection with the clock, witness having repeatedly stated that he merely inferred that some parts of the clock were used in the earlier experiments.*]

[*Question withdrawn by Mr Hill.*]

Cross-Q. 548. The first experiment that he mentioned to you was the experiment which you understood at the time to have been made in connection with the clock; was it?

[*Mr. Smith objects, that the question assumes that Mr. Drawbaugh had described some specific experiment, which the witness has never stated, having only stated that he had experimented early, or to that effect; and that the expression "in connection with the clock" is not an expression which the witness has used, and does not properly convey the idea which the witness expressed, that he inferred that some parts of the clock were used in the early experiments on the telephone.*]

Ans. If the word experiment is meant to signify experiments, as seems to be intended, then I reply that I meant to say only, that the impression was made on my mind that Mr. Drawbaugh's early experiments in telephones were made subsequent to his experiments on his magneto-electric clock, for the reason already stated, that he did not appear to have a distinct and special apparatus extant to show what he had experimented with at that early time.

Cross-Q. 549. Didn't you get the impression that his first experiments in connection with telephones were begun for the purpose of making a clock tell the hours audibly and loud, without striking them in the usual way?

Ans. I had some obscure notion of that kind; but if I said so positively, it is a surmise on my part, because I did not really know such to be a fact, I only knowing in that regard that the magnetic clock was an all-engrossing subject with him long ago—before I ever heard that he had any idea of making a telephone, and that when he, in the afterpart of the conversation, referred to the improvement having a relation to clocks by aid of the phonograph or telephone, my mind naturally reverted, that he might have begun his experiments for that purpose in beginning on the telephone.

Adjourned until July 25, 1882, at 10, A. M.

JULY 25, 1882, 10, A. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Cross-examination of Theophilus Weaver, by Mr. Hill, continued.

Cross-Q. 550. Referring to that sketch which you say Mr. Drawbaugh made at that interview, did he explain to you what the different parts of the sketch represented?

Ans. Not particularly the lower part, which I inferred was a telephone, but he did explain the top part to some extent.

Cross-Q. 551. Then he did not tell you that the lower part was a telephone, but that was only one of your surmises, was it?

Ans. The main talk was on telephones, then came his explanation how he meant to improve it, stating that his improvements might apply to the phonograph as well.

Cross-Q. 552. Please make a copy of said sketch, and letter the different parts, and explain what those parts severally were, as Mr. Drawbaugh explained them to you ~~at~~ that interview?

Ans. I will have to be guided by the sketch offered in evidence.

[Examiner hands the witness the sketch.]

[Witness draws sketch and continues.]

There is a rough sketch of the sketch, with lettering on it.

Cross-Q. 553. Please describe all the parts that you have designated by different letters, giving, as nearly as you can, the description which Mr. Drawbaugh at that time gave you?

Ans. *A* is the base or lower part, which I understood to be a telephone. *B*, the open end of it, but not explained by Mr. Drawbaugh. *G*, a vibratory arm or frame. *H*, the long arm or end of it. *K*, the point of attachment of said vibratory frame; *a*, transverse pieces on said frame. *D* an armature; said frame with armature I termed the top part. These and their communication with the lower part Mr. Drawbaugh tried to explain to me, stating that the vibration at the point *C* would be enhanced or increased, so that not only an equal amount of vibration with that of the lower part would be realized, but much more. The point *E* is simply the return of the frame, as I understood it. The parts *a* were not clearly explained to me, but he did speak of them.

Cross-Q. 554. How was the vibration at the point *C* to be enhanced or increased, so that not only an equal amount of vibration with that of the lower part would be realized, but much more?

Ans. I inferred it was by the reaction of the vibration upon the free end or long arm of the vibratory frame above.

Cross-Q. 555. Was the free end or long arm of the vibratory frame above to be fastened to anything, or bear against anything; if so, what? Or was it simply to project into the air?

Ans. It was fastened at its heel, or part *K*, and its other end was in contact with, or close proximity to the part beneath; and I understood it was to be so close as to have magnetic communication in some way.

Cross-Q 556. Magnetic communication in some way with what?

Ans. With or by the armature *D*. I had not explained to me what was beneath it.

Cross-Q. 557. What was the frame which you call the vibratory frame to be made of?

Ans. I cannot recollect now.

Cross-Q. 558. Do you remember whether it was metal or not?

Ans. I cannot.

Cross-Q. 559. Was the end *E* to be fastened to anything, or simply to project in the air free?

Ans. I understood it was to be free, and above the rest of the apparatus.

Cross-Q. 560. Did you understand that that frame from the armature *D* out to its extreme end at *E* was to be free, or, in other words, not in contact with anything?

Ans. I understood it to be free, but nearly in contact.

Cross-Q. 561. Nearly in contact with what?

Ans. The part below.

Cross-Q. 562. Did you understand that the pin *C* was to be fastened to the armature *D*?

Ans. I believe that was his explanation of it. It was to be carried by it.

Cross-Q. 563. What was the frame *G* fastened to at *K*?

Ans. I can't recollect that part of the explanation.

Cross-Q. 564. From the point *K* to the armature *D*, was the frame *G* in contact with the top of the instrument; that is, the top of the part indicated by *A*?

Ans. No, sir; only at *K*.

Cross-Q. 565. Was there a diaphragm in the instrument anywhere; if so, how many and where?

Ans. Yes, sir; it was mentioned as being in the part below.

Cross-Q. 566. Where, in the part below, near the letter *A* or near the letter *B*?

Ans. The letter *A*.

Cross-Q. 567. Was the instrument to be actuated by sound-waves or sound?

Ans. I understood it so.

Cross-Q. 568. Was the armature *D* to be attached to the diaphragm?

Ans. That part I didn't clearly understand, whether it was attached to the end of the vibratory lever or to the diaphragm; but on reflecting on it afterwards, I thought that it must have been attached to the vibratory arm.

Cross-Q. 569. By the vibratory arm, do you mean the part you have marked *G*, extending from *K* to *E*?

Ans. No, sir; only part *H*.

Cross-Q. 570. The part *H* extends from *D* to *E*, does it not?

Ans. Yes, sir.

Cross-Q. 571. Is not that part *H* merely a continuation of the part *G*?

Ans. Yes, sir; I so understood it.

Cross-Q. 572. Was the part *G*, *H* an arm or a frame?

Ans. In speaking of it, I termed it a frame. But I also termed the part *H* an arm.

Cross-Q. 573. Did you understand the armature *D* to be attached to part *G*, *H*, about at the middle of said last-named part *G*, *H*?

Ans. No, sir; if I understand the question right.

Cross-Q. 574. How do you understand the question?

Ans. That it considers the part *G*, *H* one continuous frame.

Cross-Q. 575. Well, was it not one continuous frame?

Ans. Yes, sir.

Cross-Q. 576. Well then, considering it as one continuous frame, was the armature *D* attached about at the middle of said frame, or not?

Ans. It was not. But it was vertically situated about at its middle.

Cross-Q. 577. Was it not attached to said frame *G*, *H*?

Ans. I am not positive about that, as I stated before. My impression is it was.

Cross-Q. 578. Did you understand the diaphragm to be situated right along the top of the part marked *A*, close to the upper edge of it, and extending from the end or edge *L*, to the end or edge *N*?

Ans. Yes, sir; about there.

Cross-Q. 579. Was there a mouth-piece to the instrument. If so, where was it?

Ans. There was nothing said about it.

Cross-Q. 580. Where were the sound waves to enter the instrument, in order to produce their mechanical effect upon it, or through it?

Ans. There was nothing said about that, either.

Cross-Q. 581. Did the instrument have one diaphragm, or more than one?

Ans. Only one, that I heard of.

Cross-Q. 582. Did you understand that the sound waves were to act on that diaphragm, to throw it into vibration, and thus operate the instrument?

Ans. Yes, sir.

Cross-Q. 583. Did Drawbaugh explain to you how he proposed to apply that instrument to a clock?

Ans. No, sir; not particularly.

Cross-Q. 584. Did he say he proposed to apply it in connection with a clock?

Ans. Yes, sir; he spoke of applying the top part of it in some way.

Cross-Q. 585. Did he say anything about using an electro-magnet or a permanent magnet, in connection with this instrument shown in the sketch?

Ans. I cannot re-call his words exactly. I am impressed something was said about a permanent magnet.

Cross-Q. 586. Do you remember of anything being said about an electro-magnet, in connection with that sketch, or the instrument therein shown?

Ans. I cannot recollect distinctly. I only know that a magnet was mentioned, and I am not positive which.

Cross-Q. 587. Was anything said, in that conversation, about different kinds or constructions of magnets?

Ans. Not in that conversation, but near that time.

Cross-Q. 588. What did you understand to be Drawbaugh's object in commencing that conversation?

Ans. He seemed to have come on purpose, to talk about the intention he had of taking out a patent on that improvement.

Cross-Q. 589. Did he ever mention that improvement to you from that time to this, or did you ever mention it to him?

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Ans. No, sir; I was waiting for him to turn up with a model some day.

Cross-Q. 590. Did you ever mention it to Mr. Jacobs or Mr. Chellis, or any of Mr. Drawbaugh's friends. And if not, why not?

Ans. I don't recollect that I did, except, perhaps, I may have given a hint to Mr. Jacobs during the taking of Drawbaugh's testimony on the faucet, when a certain pass-book was produced containing a sketch—something relating to telephones and phonographs—but I never explained it, to my knowledge. I think this was because Mr. Drawbaugh wanted to keep it concealed for the time being.

Cross-Q. 591. Do you swear that you did give a hint of it to Mr. Jacobs?

Ans. No, sir.

Cross-Q. 592. Did you regard it as a confidential communication from Mr. Drawbaugh to you?

Ans. I did, until I heard indirectly that nearly everything that Drawbaugh had done in his experiments was brought forward in the taking of his testimony in this case.

Cross-Q. 593. To whom did you first communicate knowledge of it, and when?

Ans. I never explained it to any one, until about two or three weeks ago I showed it to Mr. Storrow—made a few remarks about it. I did show it to Mr. Harris after Drawbaugh's witnesses had been secured by taking their affidavits; but I didn't explain it to Mr. Harris as I have done here.

Cross-Q. 594. When did you show it to Mr. Harris?

Ans. It was late in 1880 some time.

Cross-Q. 595. Was it while you and Mr. Harris were running around together, trying to pick up testimony against Drawbaugh, prior to the preliminary injunction in this case?

Ans. We didn't run around together. We only went together once—to see Mr. Shopp—and I think it was in one of the last interviews that I had with Mr. Harris that I showed it—probably after the injunction.

Cross-Q. 596. Did you ask Mr. Drawbaugh's permission to show it to Mr. Harris?

Ans. No, sir. I didn't consider it his property, nor that I was his servant?

Cross-Q. 597. You felt free to inform his opponents of his confidential communications to you, did you?

Ans. Yes, sir; and more than that.

Cross-Q. 598. When Drawbaugh, as you say, in that interview told you that he had given up his telephone experiments, did he tell you that he had given them up only for the time being, or that he had given them up completely without the intention of resuming them?

Ans. He didn't qualify his words, but his manner qualified them.

Cross-Q. 599. Then he didn't say that he had given them up for the time being, did he?

Ans. He unqualifiedly stated that he had given them up—had stopped experimenting in that early period.

Cross-Q. 600. Didn't he say that he had given up his experiments for the time being, or words to that effect? Didn't he use that expression at all?

Ans. No, sir; I have no recollection of any such expression being used by him.

Cross-Q. 601. Then, when in your ninetieth answer you swore that he stated to you in that interview, "that he had given up his experiments for the time being." You swore to what was not true, did you?

Ans. No, sir; it is a false way of putting my language. I did not quote Mr. Drawbaugh's language. Mr. Drawbaugh's meaning is put in my language. The question is a perversion, so far as it relates to the authorship of language. I stated in general terms the substance of Mr. Drawbaugh's communication to me, and such I have repeatedly stated.

Cross-Q. 602. Did you ever tell Mr. M. W. Jacobs, of Harrisburg, that Daniel Drawbaugh had shown you his telephones years ago?

Ans. I never stated anything of that import to any dead or living man.

Cross-Q. 603. I wish to refresh your recollection a little. Before Mr. Jacobs moved his office to the room where it now is, and in the summer of 1880, before you had known or met Harris, *alias* Weeks, did you not stand with Mr. M. W. Jacobs, on the steps in front of his office, at No. 5, North Third street, Harrisburg, Penna., and did you not then and there have a conversation with Mr. Jacobs concerning Daniel Drawbaugh and his electric telephones, a portion of which was substantially as follows: Mr. Jacobs asked you how long you had known about Dan's (meaning Daniel Drawbaugh's) telephones, to which you replied, "Why, Dan must have been at that a long time. I saw his instruments years ago?"

Ans. No, sir; Mr. Jacobs must have mistaken the individual, for I am positive I never saw any of Mr. Drawbaugh's telephone instruments before I saw them in this room, about ten days ago, and I had quite a different conception of the form of his instruments from what they are now seen to be, only so far as I had gathered from that sketch, which was my sole means of knowledge in that direction. I will not deny that I may have had a coversation in which I may have made some remarks on Mr. Drawbaugh's experiments, but if I used language implying that he had instruments years ago, it was but an echo of what Mr. Jacobs had stated himself, or some one else, for I had no such knowledge.

[Recess for dinner, until 2, P. M.]

JULY 25, 1882, 2, P. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Cross examination of Theophilus Weaver, by Mr. Hill, continued:

Cross-Q. 604. You do not mean to say that the examiner did not take down your ninetieth answer correctly, as you gave it, do you?

Ans. No, sir.

Cross-Q. 605. Have you examined your papers for the letters that passed between you and Harris, *alias* Weeks, as I requested?

Ans. Yes, sir.

Cross-Q. 606. Did you find any? If so, please produce them in order that copies may be made by the examiner and put in evidence.

Ans. They are here—only the letters from Mr. Harris to me. I have no copies of mine to him.

[Mr. Hill puts the letters now offered in evidence, there being five of them, dated respectively October 18, 1880; October 22, 1880; October 22, 1880; October 30, 1880; and November 3, 1880.]

The letters are as follows:

(Printed heading.)

"Manchester (N. H.) Telephone Exchange,
"L. B. Harris, Manager."

(Letter.)

"OCT. 18th, 1880.

THEO. WEAVER, Esq.,

DEAR SIR:

I got a telegram that took me away from Harrisburgh before I could see you.

*

I want to get you to quietly keep your eye peeled, and if you learn anything of our friend's movements let me know. I want to get you to go over to Camp Hill and have a talk with that man over there—I can't re-call his name—who is one of their principal witnesses, and make memoranda of what he says. I want you to see him before Wednesday, if you can, if you find out of any other witness of theirs that is important I wish you would see them and get what you can from them. There is a possibility that they will want to change their evidence after seeing ours. I will write you again in a day or two.

Yours truly,

L. B. HARRIS."

(Printed heading.)

"Manchester (N. H.) Telephone Exchange,
L. B. Harris, Manager."

(Letter.)

"OCT. 22, 1880.

THEOPHILUS WEAVER, Esq.:

DEAR SIR:

I would be free to show the witnesses on the other side Matthews, and Rockafellows, and other affidavits—it will tend to make them cautious; any little attention you can show Lloyd and Worley will be timely, and if you think best, I would let them look the evidence over.

The best way to do any kind of business is open and above board, when we can, and I can't see any objections to your showing people who are interested as much as you think best; it will be a good point to make, that Dan seems to be out of the case, and that Jews are the persons now interested.

Yours truly,

L. B. HARRIS."

(Printed heading.)

"Manchester (N. H.) Telephone Exchange,
L. B. Harris, Manager."

(Letter.)

"OCT. 22, 1880.

THEOPHILUS WEAVER, Esq.:

DEAR SIR:

Yours of the 20th came to hand this day. Can you get me a copy of the testimony in the "Kline interference case?" Keep at them as you can; on Nov. 1st send me your bill, and I will see that you get your pay; it will be better to make it at the end of each month, I think—won't that be the best way? I will have some copies of the printed evidence to send you in a day or two.

Yours truly,

L. B. HARRIS.

Make bill to 'The American Bell Telephone Company.'"

(Printed heading.)

"Manchester (N. H.) Telephone Company,
L. B. Harris, Manager."

(Letter.)

"OCT. 30, 1880.

T. WEAVER, Esq.:

DEAR SIR:

Yours, with enclosed bill, is received, and I have approved it and forwarded it to the company for payment, which they will do as soon as possible.

I am sorry that you could not have seen those other parties before Chellis and Jacobs had a chance to see them, after we filed our evidence, so as to give them a chance to change their statements. It seemed to me that there was time enough.

Yours truly,

L. B. HARRIS.

I will write again in a few days."

(Printed heading.)

"Manchester (N. H.) Telephone Company,
L. B. Harris, Manager."

(Letter.)

"NOV. 3, 1880.

THEOPHILUS WEAVER, Esq.:

DEAR SIR:

We are in receipt of information from "our friends" which will relieve us from further movements at present. I will let you know if it is desired that you take up the line of march again.

I shall be glad to hear from you at any time.

Yours truly,

L. B. HARRIS."

Cross-Q. 607. Are these five letters all the correspondence between Mr. Harris and yourself that you could find?

Ans. Yes, sir.

Cross-Q. 608. In that of Oct. 18, 1880, I find a request for you to go over to Camp Hill and have a talk with some man there. What man did you understand that to mean?

Ans. That probably was Mr. John Oyster.

Cross-Q. 609. Did you go over to Camp Hill to see him, as Mr. Harris requested?

Ans. I went over to Jacob Kline's, and there I learned that he was out west, and of course that ended the matter.

Cross-Q. 610. Had you seen him before the date of Mr. Harris' letter of Oct. 18th, with reference to the Drawbaugh telephone?

Ans. No, sir; I never saw him to know him.

Cross-Q. 611. In Harris' letter of Oct. 30, he says: "I am very sorry that you could not have seen those other parties, before Chellis and Jacobs had a chance to see them," etc. What other parties were those?

Ans. I cannot tell for certain, only that I had seen a Mr. Coble, a school-teacher, but not until he came home from a teachers' institute, somewhere at a distance. As the plural was used, I don't know who the other party was. But I did accidentally meet Mr. George Free at the station, and he gave me a statement of what he had sworn to, without me asking him. Stating certain changes that he and Oyster probably would make in their affidavits, which were taken some six months before that. That is all I can remember now. Probably that is what he referred to.

Cross-Q. 612. What is Mr. Coble's full name, and where does he live?

Ans. I can't give it now. I have a note of it somewhere. He taught school about a half mile south of White Hill station.

Cross-Q. 613. When did you see Mr. Coble about the Drawbaugh telephone, and how many times?

Ans. Only once—probably a few days before the date of that letter.

Cross-Q. 614. Did you tell Mr. Coble what you wanted. If so, what did you tell him?

Ans. I can't recollect what I told him, except that I wanted him to tell what he knew of Drawbaugh's experiments on telephones. And as he didn't appear to know anything of importance, I didn't tell him what I wanted.

Cross-Q. 615. Did you tell him that you were a friend of Daniel Drawbaugh?

Ans. No, sir; I didn't tell anything about that—that I can recollect.

Cross-Q. 616. How many times were you over to see Mr. George Free about Mr. Drawbaugh's telephones?

Ans. I never went to see him expressly, and only met him once, at the time I have stated.

Cross-Q. 617. When was that one meeting with him, and where?

Ans. When I accidentally met him at White Hill station on my return at that time, two or three days before the date of that letter of October 30, 1880. I think I seen Mr. Kline on the same trip, or a little while before; a day or two before probably.

Cross-Q. 618. Was your meeting with Mr. George Free at the station purely accidental, or were you seeking him?

Ans. I probably would have gone to seek him if I hadn't accidentally met him there.

Cross-Q. 619. Don't you know that you were seeking him at the time when you say you accidentally met him?

Ans. I didn't go there for that purpose, but he happened to be there.

Cross-Q. 620. I have been informed that you were at White Hill station three different times, inquiring for Mr. George Free, at that period; that on the third time, shortly after you had inquired for him, some person present came and said: "Here he is," and brought you and Mr. Free together, and then you proceeded to inquire of Mr. Free about Drawbaugh's telephones. Is my information substantially correct or not, and if not, wherein is it incorrect?

Ans. The facts are about these: I went over there only twice to my knowledge; but on going out from the station to see Mr. Coble, I made some inquiries as to where Mr. Free lived, and I think some one informed me that he wasn't about just then, and then when I came back to the station I believe some one did point him out to me, and we came together in the station, and probably I started him to talk by some remark. At any rate, we stepped back a few paces from the platform, where we had a conversation. I had somehow learned that he was going to change his affidavit, which he corroborated in conversation; but I learned it was to be all the more in favor of Mr. Drawbaugh, and I didn't deem it proper to approach him further.

Cross-Q. 621. Mr. Free lived close by White Hill station, did he not?

Ans. Yes, sir; pretty near.

Cross-Q. 622. Now, when you go right into a man's neighborhood inquiring for him, and in consequence of your inquiries he is pointed out to you, and you accost him and transact your business with him, that is what you call accidentally meeting him, is it?

Ans. I suppose it is understood how I did meet him, which I suppose was somewhat accidental, on my return, for I did not expect to see him on my return.

Cross-Q. 623. But when you swore that you accidentally met him, it was not understood how you met him, and it took considerable cross-examination to bring out the facts. Why did you not state the facts just as they were the first time?

Ans. I am not responsible for your misunderstanding, when all the facts were not called for at first; and further, I count it accidental yet that I did meet him at the station under the circumstances.

Cross-Q. 624. In your six hundred and twentieth answer, you say that after you and Mr. Free came together in the station, "probably I started him to talk by some remark." Don't you know that you began to inquire at once about Drawbaugh's telephones and his affidavit?

Ans. Yes, sir; that was my object, at least, to find out how he stood with relation to his affidavit, and what he knew.

Cross-Q. 625. In that conversation with Mr. Free, did you pretend to be a friend of Daniel Drawbaugh, or say that you were his friend?

Ans. I don't think I said anything of the kind, in so many words, nor did I profess to be.

Cross-Q. 626. Just as you closed the conversation with Mr. Free, while referring to Daniel Drawbaugh and this suit, did you remark to Mr. Free, "Oh, Dan will make it?"

Ans. I don't recollect those words.

Cross-Q. 627. Did you say anything like them, or to the same effect?

Ans. It appears to me I said, "I hope the right one will gain it."

Cross-Q. 628. You have referred in your cross-examination, in answer four hundred and fifty-three, to business which you did for Hamilton Baily last year. What business was that?

Ans. It was work on a modification of his patent dumping-wagon, a form which he has still further modified since. He has spoken to me recently about taking out a patent on it, but my work last year was on the model of it.

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Cross-Q. 629. Didn't you get up your dumping-wagon at the time when you were working on Mr. Baily's applications for patents on dumping-wagons?

Ans. No, sir; I invented it before, when I was at work on jump-seats for carriages, for C. K. Mellinger, if I remember rightly, but I patented it after I took out the patent for Mr. Baily.

Cross-Q. 630. Did you tell Mr. Baily anything about it prior to the issue of his patent?

Ans. I believe I did. I generally do business in that way.

Cross-Q. 631. Have you any recollection about it any way; that is, about telling him?

Ans. Not particularly, only that he ridiculed it.

Cross-Q. 632. Was that prior to filing Baily's application, or while the application was pending or after his patent issued?

Ans. I cannot tell that exactly, only that he knew all about it long before my patent came out. I had another model made of my dumping wagon, and it was standing there where he could see it.

Cross-Q. 633. You have referred to your patent on clothes-hook and line-holder, 18th August, 1868; did one George Nebinger have anything to do with that application?

Ans. Yes, sir.

Cross-Q. 634. Was he to pay all of the expenses and have an assignment of half of the patent in consideration thereof?

Ans. Yes, sir; that was the understanding.

Cross-Q. 635. Did you get into any trouble with him about the business?

Ans. No, sir; not particularly. We settled, and I have his final receipt on it. There was a queer circumstance connected with it.

Cross-Q. 636. I have heard there was, and that it consisted in this: that after you and he had made the agreement, and he had performed his part of it, you, in his absence, sold the entire patent and pocketed the proceeds, but he afterwards succeeded in getting his one half from you. How far is that information correct?

Ans. About ninety-five per cent. gossip, and five per cent. fact, with due variation. Squeezing the whole thing together and boiling it down, there are some signs of honesty in your informant left. The only hook I find to put an answer on to such a question, is to stretch the line, as follows: Nebinger paid the first fee to make the application, and then, through his own choice, he employed D. P. Holloway, of Washington, to procure the patent, at his own expense. Nebinger went away, and I didn't hear about the affair for a good while; but he held a provisional assignment from me. One day the patent came to me. I wrote to Nebinger to know if he had paid the final fee, and the attorney, and he wrote me that he did neither. I wrote on to Holloway, and he couldn't account for the issue of the patent, stating that some other one's final fee must have been mis-applied; and to this day I never could find out who had paid it. Nebinger was unable to pay Halloway, and I was ashamed to let him go unpaid, and I paid him, or satisfied him with a part pay of his fee. I repeatedly wrote to Nebinger to come up to time, and he had no money; but he got me to work up some patterns on the line-holder and another invention which he had. I sent them on to Philadelphia, as he directed me. He afterwards stated that he never got them. They cost me more than the money that he had paid me. He gave me to understand by letter that I should go ahead and dispose of the line-holder as I saw proper. After putting some more money into it, I sold it for a small sum; but he thought I had received much, and came on and raised a fuss the subject of the gossiping question. I settled with him, taking his receipt in full for five dollars.

Cross-Q. 637. Do you know A. D. Repman, of New Cumberland, Cumberland county, Pennsylvania?

Ans. I can't re-call anything about him. I have heard the name. It occurs to me now, there was something connected with a sewing machine related to Repman.

Cross-Q. 638. Didn't you file an application for a patent for him some ten years ago?

Ans. I intended to. I doubt whether I did.

Cross-Q. 639. Didn't you notify him that you had, and that it had been allowed, and call for the second Government fee from him, and receive it, but never deliver the patent nor return the second Government fee to him?

Ans. I have no recollection of anything but a consultation, now.

Cross-Q. 640. What fees did you charge for your services in preparing the application for the Drawbaugh magnetic clock, and what fee did you charge for the second application after the division of applications was made?

Ans. I have already stated I received thirty dollars for making the application on the clock, and I believe I received ten dollars on the new application on earth batteries. The latter case was not merely a division, but a new model was filed, showing a peculiar clock in connection with earth battery devices, requiring drawings and specification to be carefully drawn to avoid another division of application.

Cross-Q. 641. You referred in your two hundred and ninety-first answer to the corn-sheller of one Brady, of Mount Joy. What was Brady's first name?

Ans. C. H., I believe.

Cross-Q. 642. What was the firm name?

Ans. I believe it was Brady, Mishey & Co.

Cross-Q. 643. Do you know where Brady is now, and where he is doing business?

Ans. I cannot tell. Only I heard a report that he was out west somewhere, probably at Chicago, or some other point.

Cross-Q. 644. Was not the name William Brady, or T. G. Brady?

Ans. William Brady had an interest in the Brady sheller.

Cross-Q. 645. Did you not go to them, to get an agency for the sale of that sheller?

Ans. No, sir.

Cross-Q. 646. Did you not apply to them for that purpose?

Ans. No, sir; I only applied to C. H. Brady, in 1869, to see if he would run my bird-sheller for me.

Cross-Q. 647. Did he decline to do it?

Ans. Yes, sir; he said he would like to, but they ought to be run on a large scale, and he couldn't do it.

(Mr. Hill puts in evidence the copy made by the witness to-day, of "Complainants Exhibit—Drawbaugh-Weaver Sketch of 1878," the same to be marked "Exhibit, Copy Drawbaugh-Weaver Sketch of 1878.")

(By consent, copies of the Harris letters above put in evidence, are to be used instead of the originals, the originals to be retained by complainant's counsel, and to be produced when called for.)

Adjourned until July 26, 1882, at 10, A. M.

JULY 26, 1882, 10, A. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Re-direct examination of Theophilus Weaver, by Mr. Smith.

Q. Q. 648. In the three hundred and third cross-interrogatory, you were asked by Mr. Hill this question, referring to your difficulties with Mr. Kutz: "Were his proceedings in the nature of a criminal charge for perjury?" And you answer: "I did not know it to be such charge." You were then asked: "Did he employ counsel in the matter. If so, who?" And you answered: "I think I was notified by one George H. Irwin, Esq., Third street, Harrisburg, who notified me to appear before him before proceeding against me for him, the said Kutz." In order that we may judge with what justice this suggestion was made, that you were threatened with proceedings in the nature of a criminal charge for perjury, will you produce, if you have it, the letter which you received from Mr. Irwin in relation to the matter, to be copied by the examiner, and made an exhibit in the case?

Ans. Yes, sir; I will. This is it.

[The letter is as follows, a copy being substituted by consent, the original to be produced by complainant's counsel when called for:

GEO. H. IRWIN,
Attorney-at-Law,
Office: No. 3½ N. Third St.

HARRISBURG, PENNA., Jany. 1st, 1874.

DEAR SIR:

I would like to see you about the patent sulky attachment to plows, in which Mr. H. D. Kutz possesses an interest or right, under an article of agreement between you and him. We can possibly arrange the matter satisfactorily to Mr. Kutz and you, if you call at my office not later than the early part of next week, as he intends soon to go to Washington on this business. The agreement is duly recorded in the Patent Office, and we are now prepared to move in this matter legally, if you do not give to Mr. Kutz what it is his right to have.

Yours, etc.,
GEO. H. IRWIN,
Atty. for H. D. Kutz.

To Mr. THEOPHILUS WEAVER,
Paxton St., Hbg.

(Address.) Mr. Theophilus Weaver, Paxton St., Harrisburg, Pa.

(Post-mark.) Harrisburg, Jan. 2, Pa."]

PHONE COMPANY,-3

Q. Q. 649. I observe that Mr. Irwin's letter refers to an interest which Mr. Kutz possessed under an article of agreement between you and him, and which he says had been duly recorded in the Patent Office. I suppose that to refer to the same assignment which you mentioned in your answer to the three hundred and seventh interrogatory, and which Mr. Hill, in the three hundred and tenth interrogatory, asked you to procure a certified copy of. As he did not afterwards ask you to produce such a copy, I will now ask you to produce it, if you have it, to show the true relations between you and Mr. Kutz, and the dates of the transactions to which it refers?

Ans. Yes, sir; here it is. It is a certified copy which Mr. Storrow procured for me, and of which I have had copies made.

[Complainant's counsel offers the certified copy in evidence, to be marked "Exhibit Weaver Assignment." By consent the following copy is substituted for the original, the original to be produced by complainant's counsel when called for.

"Liber N. 18, p. 374.

HARRISBURG, PA., July 9th, 1873.

Whereas the Patent Office has required a division of a certain application for patent on Attachment for Plows and Wheels, and whereas H. D. Kutz has in part paid, and agrees to pay the final fee on Patent of Sulky Attachment, in consideration for which I agree to authorize the Commissioner of Patents to issue said patent on Sulky Attachment to us as equal assignees.

And whereas said H. D. Kutz has paid me in hand $5 as part of first ——— on a new application for patent on the Wheel excluded from said patent by the ruling of the office, the receipt of which is hereby acknowledged. I do hereby agree further to make a formal assignment to said H. D. Kutz, for the free and equal use of said Wheel on said Sulky Attachment, to be sold, used, and enjoyed by us conjointly and equally in said patent to be issued on Sulky Attachment for Plows.

Witness my hand this 9th day of July, 1873.

THEOPHILUS WEAVER.

2. Received June 4th, 1873, of H. D. Kutz, the sum of sixteen dollars as first fees on application for patent on Sulky Attachment for Plows, as worked up by me, for which, and the final fee, I agree to assign one undivided half interest of the patent.

THEOPHILUS WEAVER.

Recd. Dec. 21, 1874.
Ex'd J. A. W.
M. McK."]

Q. Q. 650. I notice that Mr. Irwin's letter is dated January 1, 1874, and that it speaks of the assignment as being duly recorded in the Patent Office; but on reference to the certified copy, I find it was received for record December 21, 1874, and I infer that Mr. Irwin must, on the 1st day of January, have made a mistake and written 1874 instead of 1875, which was subsequent to December 21, 1874. Have you any recollection about the time, or any circumstance which would lead you to infer that Mr. Irwin did make that mistake?

Ans. Yes, sir; I have. The circumstance is this: When I had the difficulty with Mr. Kutz referred to, I recollected he had a partner by the name of Stockstill in the patent of 1873, on plow, and I was prompted to satisfy my own mind, that I had done right with Mr. Kutz to write to Mr. Stockstill to know how Mr. Kutz deported himself in relation to him, Mr. Stockstill; and in hunting up my old letters, I find Mr. Stockstill's answer dated January 20, 1875, it having been written soon after the notification letter of Mr. Irwin referred to.

Q. Q. 651. Will you produce the letter from Mr. Stockstill to be copied by the examiner as an exhibit?

Ans. Yes, sir; here it is. I have had a copy made of it, also.

[Mr. Smith puts the letter in evidence, to be marked "Exhibit Stockstill Letter." By consent, the following copy of said letter is substituted, the original to be produced by complainant's counsel when called for:

"JAN. 20, 1875.

THEO. WEAVER:

DR. SIR: Yours of the 11th inst. is received, and you ask how Kutz and I stand. I suppose you mean financially; if so, will say he owes me some money honestly. If you mean as friends, will say he owes me apologies, honestly, neither of which do I expect he will render. Secondly, you ask, are we partners. I am paying no attention to him as being anything to me; consider him a failure. Thirdly, "Is he," (Kutz,) "inventor with you?" (me.)—Not in the least; became so only by virtue of his *oath*.

Fourthly. "Did he act honorably by you?" (me.)

The above will answer.

Yours, etc.,

S. L. STOCKSTILL.

PHONE COMPANY,-3

(Addressed.) Mr. Theophilus Weaver, Attorney, Harrisburg, Pa.
(Post-marks.) Osborn, O., Jan. 20.
1-22."]

[*The statements of the above letter, excepting the date, objected to by Mr. Hill as mere hearsay, and incompetent.*]

Q. Q. 652. I observe that the receipt which you gave Mr. Kutz for sixteen dollars, "as first fees on application for patent on sulky attachment for plows, as worked up by me, for which and the final fee I agree to assign one undivided half interest of the patent," is dated June 4, 1873. Do you remember whether that date was prior to the drawing up of the specification to which both you and Mr. Kutz made oath. And if you know on what date you made the oath, will you give it?

Ans. Yes, sir. My recollection is pretty clear that that was a number of days before the day on which we took the oath together. I have that old specification yet, by which I can fix the date exactly, if required. It is in the adjoining room, I believe. Here it is now. I find, by reference, it was sworn to on June 14, 1873.

Q. Q. 653. In your cross-examination you spoke of your recollection of the form of the oath. Will you please hand the paper you have just produced to the examiner, to make a copy of the oath and the signatures?

Ans. Yes, sir; here it is. I find the language is precisely as I quoted it from recollection on the point referred to.

[The oath is as follows:

COUNTY OF DAUPHIN, }
State of Pennsylvania, } *ss:*

Theophilus Weaver and Henry D. Kutz, the above-named petitioners, being duly sworn, depose and say that they verily believe themselves to be the original and first inventors of the improvement in sulky attachment for plows described and claimed in the foregoing specification; that they do not know and do believe that the same was ever before known or used; and that they are citizens of the United States.

THEOPHILUS WEAVER.
HENRY D. KUTZ.

Sworn to and subscribed before me, this 14th day of June, 1873.

PETER STUCKER,
Alderman."]

Q. Q. 654. I do not wish to encumber the record with a long description of the mechanism in that specification, unless it is required by the counsel for the respondents, but I wish you to point out to the examiner, to be copied by him, such passages as mention your name and that of Mr. Kutz, or refer to you by a plural pronoun?

Ans. I find such on the first page, as follows:

"*To the Commissioner of Patents:*

Your petitioners, residents of Harrisburg, Pa., pray that letters patent may be granted to them for the invention set forth in the annexed specification.

THEOPHILUS WEAVER,
HENRY D. KUTZ.

To all whom it may concern:

Be it known that we, Theophilus Weaver and Henry D. Kutz, both of Harrisburg, county of Dauphin, and State of Pennsylvania, have invented an improved SULKY ATTACHMENT for plows, of which the following is a specification:

The nature and objects of our invention are embraced——"

At the end of the statement of the specification and description following the passages above quoted, and preceding the claims, is the following passage:

"Having thus fully described our invention, what we claim as new, and desire to secure by letters patent, is——"

Q. Q. 655. I observe that the second paper given by you to Mr. Kutz bears date July 9, 1873, and that it refers to the division of a certain application for a patent on an attachment for plows and wheels. Was this a division of the application for a patent in your name individually, which you have stated that you drew up and filed after the specification was drawn up to which you and Mr. Kutz both made oath?

Ans. Yes, sir; it referred to that invention; the only invention I ever made on sulky plows. The date of my individual application, before the division, was June 28, 1873.

Q. Q. 656. Reference has been made to some business which you had with one Nebinger, and you referred to a receipt which he gave you. If you have that receipt, will you please produce it, to be copied by the examiner as part of your answer?

Ans. Yes, sir; here it is.

(The receipt is as follows:

"Received, Sept. 25, 1874, of Theophilus Weaver, five dollars as balance in full on all accounts to date, including line-holder and all patent arrangements.

$5 00 G. R. NEBINGER.")

Q. Q. 657. In your answer to the six hundred and thirty-sixth interrogatory, you said among other things: "He gave me to understand by letter, that I should go ahead and dispose of the line-holder as I saw proper." Have you, since the last adjournment, made search for that letter, and if so, have you been able to find it?

Ans. Yes, sir; I searched for it, but could not find that letter, but found another.

Q. Q. 658. You say also in that answer: "after putting some more money into it," (referring to the patent in question,) "I sold it for a small sum; but he thought I had received much, and came on and raised a fuss," &c. Will you state how much you received for it, and whether it was more or less than any expenses you may have incurred on account of it. And will you also state how much Mr. Nebinger thought you had received, when he came on?

Ans. My recollection of it is, that I received about one hundred and twenty-five dollars for it, but had so much expense on it, in various ways, that I didn't make much on it. I had a great deal of trouble with it. I believe Mr. Nebinger had been informed that I had received about five hundred dollars for it. After he saw a statement which I made of all the items of expense on it, he was satisfied to take five dollars as balance in full, and settle the account, as shown in that receipt.

Q. Q. 659. State whether or not your relations with Mr. Nebinger, after that settlement, continued friendly; and if the letter to which you have just referred, indicates in any way what your subsequent relations were, will you hand it to the examiner to be copied as part of your answer?

Ans. We were the best of friends after that, and he frequently called at my place. He took a deep interest in a translation of the New Testament which I was engaged on, and had been then, already. And he spoke favorably of my compensation journal. I have here a letter which explains itself, showing a part of what passed between us on the subject of the journal. I now hand the letter to the examiner.

(The letter is as follows:

PHILA., PENN.,
Sept. 4th, 1877.

THEOP. WEAVER.

DR. SIR:

I have shown your drawing of "compensating bolt" to a party, & they asked if I had a model, and said if it was what it appeared to be, and the price asked for it was not too high, they would make an offer.

Can you send me a model? If so, send by Express to Phila., (do not direct to my house,) and write me the lowest figure in cash you will take for it. I will then do the best I can for you.

Yours truly,

GEO. R. NEBINGER,
1534 Christian St.")

Q. Q. 660. Is Mr. Nebinger now living. If not, how long has he been dead?

Ans. He died about two years ago.

[Recess for dinner, until 2, P. M.]

JULY 26, 1882, 2, P. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Re-direct examination of Theophilus Weaver, by Mr. Smith, continued.

Q. Q. 661. Have you made an examination, to find if you filed an application for a patent for Mr. A. D. Repman, as referred to in interrogatory six hundred and thirty-seventh. If so, with what result?

Ans. I made a careful search of my old files and letters, and can find no trace, in any form, to show that I ever made such application.

Q. Q. 662. Will you give the particulars of the work which you have done for Hamilton Baily since taking out your patent of September 14, 1875, on dumping-wagon?

Ans. Yes, sir; I took out the following patents for him:

Re-issued on December 7, 1875, his patent, No. 147,468, on dumping-wagon, re-issue No. 6,783.

Patent on dumping wagon, November 27, 1877, No. 197,447.

Patent on dumping-wagon, November 12, 1878, No. 209,745.

Worked on remodeling dumping wagon for him in the spring of 1881.

Q. Q. 663. Will you give the particulars of the work you have done for Dr. J. W. Moffitt, since you made the brake-shoe that has been referred to?

Ans. Yes, sir; I made an alteration of the model of F. F. Wagner, on paper-ruling machine, patented August 31, 1880, No. 231,694; application filed May 31, 1880. The work I did on that model was done by J. W. Moffitt's order, to embody his ideas. Said Moffitt and Rev. W. H. H. Snyder, both of Harrisburg, paid for taking out the patent; in which case I was attorney. Dr. Moffitt went to Baltimore after I had started making the application, and there saw Mr. Wagner, and made an agreement with him. Then, also, about January, 1881, I did work for Dr. Moffitt on a celluloid vulcanizer. I made some changes, by a suggestion, on his plan of building his vulcanizer. Made a working drawing or plan of it. Engaged a wood-turner. Did some work on pattern making. Bought some fifteen pounds of brass castings—these for him. Paid for them out of my own pocket. Handed the work over to Dr. Moffitt, receipt and all, and was paid for my time and expense by him. He finished up the apparatus then, and I was present in his office in February, 1881, when it was tested.

Q. Q. 664. What work have you done for John W. Anderson since taking out your patent of October 25, 1881, on carriage seats?

Ans. I took out the following patents for him:

Slicing machine, patented November 1, 1881, No. 248,978.

Slicing machine, patented January 24, 1882, No. 252,595.

Device for converting motion, patented January 24, 1882, No. 252,821.

Slicing machine, granted April 1, 1882.

I sold my entire interest to the Anderson Manufacturing Company, of which John W. Anderson is treasurer, after I had taken out two patents for said John W. Anderson, himself, on carriage seats, both dated 1881.

Q. Q. 665. What did you obtain for that patent, and how came you to make the invention which it embraced?

Ans. After I had taken out Anderson's last patent on carriage seats, I told them I knew I had taken out more patents on carriage seats than any other attorney or set of attorneys in the United States, and that I believed I could still make an improvement, that was distinct from all the patents I had ever taken out on that subject. "Well," said he, "if you can do that, we would like to have the first chance to buy it." He

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asked me to make a model, and send it to them. I did so, and he came up, and we entered into an agreement. The company paid for patenting it, and I never put a dollar into it. They were first to run it on royalty, but they finally preferred to pay for it cash, allowing me about three hundred dollars for the entire interest. I have since made it over to them for Canada also, mainly out of good will, receiving only ten dollars for Canada.

Q. Q. 666. Do you know of any statute which prohibits a man from making an improvement, and patenting it, on another man's invention, the patent for which he has assisted in procuring, or any moral law, or rule of professional conduct, which he violates in doing so?

Ans. No, sir; I do not, provided the improvement which he makes on another man's patent is acknowledged by him to be auxiliary and tributary to the foundation patent. But if his improvements are not of a tributary nature, but are original inventions, I think he simply fulfills the intent of the patent system, which has for its object to foster an encourage invention. In the latter case he has the right, civil and moral, without a proviso. I know of no law to the contrary.

Q. Q. 667. Can you state, approximately, how many patents you have taken out for other people, say within the last ten years?

Ans. I believe nearly one hundred and fifty.

Q. Q. 668. Referring to Mr. Gorgas' affidavit, which you assisted in preparing, did you understand that the sum of eight hundred and seventy dollars mentioned therein, with the exception of some part for tools sold, was a sum which he had actually earned in the service of the company, and which had been credited to him?

Ans. Yes, sir.

Q. Q. 669. In your answer to the five hundred and twentieth cross-interrogatory, you speak of Mr. Drawbaugh's asking you to look up the patents relating to vibratory or trembling sign, then displayed in Daniel Hamaker's drug-store window. Do you remember for what purpose he wished the inquiry to be made?

[*Objected to by Mr. Hill, as immaterial.*]

Ans. Yes, sir; he stated he had under consideration applying his earth battery with some kind of motor mechanism to actuate the sign, or one like it, and wanted to know what claims there were on it. Such is my recollection. He did not specify particularly how he meant to do it.

Q. Q. 670. Your investigations were also to extend to Brush's patents relating to carbon burners and electric lights. Do you remember whether your investigations were to relate particularly to carbon burners, or were to extend to all of Brush's patents relating to electric lights?

Ans. More especially to the patents on the carbon burners, or, as he termed them, the candles. He wanted to know what claims there were on them.

Q. Q. 671. Did he state why he wished to know what claims there were on them?

Ans. Not particularly, only that he was experimenting on something which was related to them somehow.

Q. Q. 672. At the end of that answer, after stating the results of your investigation, you say: "This leads me to think that was the first time Mr. Drawbaugh ever referred to carbons in connection with his early experiments, except coke in connection with his earth battery plates." Do you remember what early experiments he referred to in connection with carbons, at that interview, in the latter part of 1878?

Ans. The word early, there, is misleading, and should have been omitted. I meant the experiments about May, or the time of making the clock application, and after that in that year. I don't know, really, what use he wanted to make of the carbons, but they were called for in connection with his electrical experiments.

Q. Q. 673. In your answer to the six hundred and third cross-interrogatory, relating to an alleged conversation with Mr. Jacobs, you say: "I will not deny that I may have had a conversation in which I may have made some remarks on Mr. Drawbaugh's experiments." Have you any recollection of having any such conversation with Mr. Jacobs?

Ans. No, sir.

Q. Q. 674. In your answer to the four hundred and forty-ninth cross-interrogatory, you speak of an individual stopping here in the summer of 1879, "a Mr. Stouffer, if I recollect correctly, who had been in the solicitor business in Washington, D. C." Can you now say whether you did recollect correctly the name of the individual referred to?

Ans. No, sir; I think I was in error in that matter. The name should have been J. Franklin Reigart. His name is mentioned in the motion papers. His name appears as attorney in some of Mr. Drawbaugh's applications for patents.

Q. Q. 675. In your answer to the ninetieth interrogatory, you said, referring to Mr. Drawbaugh, among other things, in giving an account of his conversation with you at your office, "that he had given up his experiments for the time being, and now it was too late for him to hope to have any standing as the inventor of the electric telephone." Did you use the expression "for the time being" with reference to anything which Mr. Drawbaugh said indicating an intention to resume his experiments, or with reference to the time which had intervened between the earlier experiments of which he spoke, and the later ones which he had been engaged upon recently?

[*Objected to by Mr. Hill as leading and incompetent.*]

Ans. No, sir; I did not mean to convey the impression that Mr. Drawbaugh had stated that he meant to resume those early experiments, but the expression, "for the time being," I used in the sense of the time intervening between those early experiments—before Bell came out with his telephone—and the after experiments, about May, or tolerably near that time, in 1878. I did not know precisely how long the intervening time was; but I inferred it was a long time. He conveyed that impression on me.

Re-cross-examination by Mr. Hill.

Re-cross-Q. 676. Referring to your six hundred and sixty-ninth answer, in which you say Mr. Drawbaugh had under consideration applying his earth battery with some kind of motor mechanism, to actuate the sign, or one like it, did you know that Mr. Hamaker himself had directed Mr. Drawbaugh's attention to that sign, and suggested the application of his earth battery to it as a motor?

Ans. No, sir; I never heard that till now, to my recollection. I do recollect that he stated he saw it as he came into town at Mr. Hamaker's window; but Mr. Hamaker, I do not think, was mentioned as conversing about it.

Re-cross-Q. 677. Referring to your six hundred and seventieth answer, and the answer immediately following relating to your investigation of the Brush patents and your conversations with Mr. Drawbaugh on that subject, state all that Mr. Drawbaugh told you in those conversations about experimenting on electric lights or carbon candles?

Ans. I don't know that he said that he was experimenting on electric lights. He said he would like to know of what composition the candles were, and what claims there were on them. He said he didn't care so much about the machines for generating the electricity as he did for the burners—the carbon points—which, I think, he called candles also. He said he was experimenting on something, or was trying something. It appears to me he said he was trying something, but I don't think he told me what it was, and I didn't feel like intruding to ask him.

Re-cross-Q. 678. You don't remember all that was said during that conversation; do you?

Ans. It is likely that I do not; but it was in that same conversation that the signs were talked about, and I remember he mentioned the trembling parts of the sign also—wanted me to see whether that part was covered by the claims. That was the main thing on the signs.

Re-cross-Q. 679. Did he tell you that some person had written to him asking him certain questions about the Brush electric lights, and that he was seeking the information in order to properly reply to that communication?

Ans. No, sir; I have no recollection of that; but I do recollect that he offered to pay me for that search, which seemed to be unusual for him to engage me to do work of that kind and offer to pay for it, as I had accommodated him sometimes to make a simple search without charging him anything. My impression is, it was for his own use in experimenting.

Re-cross-Q. 680. When was that conversation?

Ans. It was a couple of weeks before the large clock at Dr. Moffitt's (then on Market street,) had got the tantrum and wouldn't go right, and the earth plates had to be taken up and placed, I believe, deeper in the ground, or something changed at them, and some of the partners of the clock company were at Moffitts', and that, I believe, was in December. Reckoning several weeks ahead of that would bring it in the latter part of November, 1878. I remember this, because I had waited two or three weeks to see Mr. Drawbaugh, and there is where I met him. We had not much talk on the subject, as the clock was the main talk then.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 26th day of July, A. D. 1882.
FRED. M. OTT, *Examiner.*

THEOPHILUS WEAVER.

Adjourned until July 27, 1882, at 10, A. M.

JULY 27, 1882.

Examination resumed, pursuant to adjournment.

Present, Mr. Smith and Mr. Storrow, for complainants, and Mr. Hill and Mr. Jacobs, for respondents.

[By consent, the copy of the faucet interference record, put in evidence on page 1070 of defendants printed record, is now withdrawn, and a certified copy of the same is substituted for it.]

WILLIAM NATCHER being produced, sworn, and examined, saith:

Examined by Mr. Storrow:

My age is sixty-eight; residence, Carlisle, Cumberland county, Penna.; occupation, formerly a miller; I am retired.

Q. 1. Did you, at one time, run the grist-mill at Eberly's Mills?

Ans. Yes, sir.

Q. 2. Did you, when you first went there, run it on your own account, or as miller for somebody else?

Ans. I run it on my own account; I had it leased.

Q. 3. If you have here the lease under which you first occupied that mill, please produce it?

Ans. Here it is; this is a true copy of the original.

(Witness produces copy of lease.)

[*Objected to as secondary*]

Q. 4. Where was the original lease left when it was signed?

Ans. In Carlisle, with A. L. Sponsler, a crippled man, on Main street.

Q. 5. In whose handwriting is this copy, and when was it made and handed to you?

[*Same objection by Mr. Hill, and it is further objected to as immaterial.*]

Ans. Mr. Sponsler drew the original, and at the same time drew this copy, and handed it to me.

Q. 6. Has this paper been in your possession ever since?

[*Same objection.*]

Ans. Ever since.

(Mr. Storrow requests the examiner to note that the paper produced is a copy of a lease from Christian Eberly and John Beetem to William Natcher, dated March 1, 1870, of the grist-mill property at Eberly's Mills, including several houses and ten acres of land, at a rent of eleven hundred dollars a year. The lease to commence April 1st, 1870, and continue one year. Signed by the three parties, and witnessed by A. L. Sponsler.)

[Paper put in evidence, marked "Exhibit, Natcher Lease."]

[*Same objection.*]

Q. 7. Was Mr. Sponsler a lawyer at that time?

Ans. He was a justice of the peace.

Q. 8. If you have the day-book and ledger which you kept while running that mill under that lease, please produce it, and state in whose handwriting it is.

Ans. I produce the book, which contains both day-book and ledger, parts of the same book being devoted to each. It is in my handwriting.

Q. 9. Please read to the examiner, to be taken down as part of your answer, the heading of the first page of the day-book, and the date of the first entry therein.

Ans. "Eberly's Mills.

Day-book, W. Natcher.

(First entry.) April 5, 1870."

Q. 10. Will you state up to what time you ran that mill, under that lease, and whether you gave up the lease before it expired. If you have any memorandum in your said book which helps you to fix the date, you may refer to it.

Ans. I have, on page forty-eight of the day book.

Q. 11. What time did you stop running the mill under that lease?

Ans. The 5th of September, 1870. One of the entries on page 48, following the date of August, 1870, is: "Expenses of flitting William Natcher & Son;" and another memorandum is: "On the eighth August I gave Beetem and Eberly notice that would leave the mill; written by J. B. Drawbaugh; served by the constable at Frogtown, Lower Allen township." Another is: "1870, August 19, John Beetem was at my house on the nineteenth, was at my house, and told me he had a man to take the mill."

Q. 12. Did you afterwards go back to the mill the following year, and if so, in what capacity, and who then owned the mill?

Ans. I went back. George Leonard owned the mill. I done all the work and got the one third of all the tolls and flour making, &c., and one half of the off-falls, and house rent free and the gardens.

Q. 13. If you kept in this same book an account for the mill while you were there under that arrangement with George Leonard, please re-

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fer to it, and read the heading of the first page and the first date, that relate thereto?

Ans. I kept the same book. The heading of the first page is as follows: "G. Leonard's Mills, Formerly Eberly's." The first date is October 17, 1871.

Q. 14. Up to what date did you run that mill for George Leonard, and if you have any entry in the same book which helps you to fix the date, please give the date of the last entry which refers to running it for George Leonard?

Ans. I have. The ninth of August, 1872, is the last entry. It is as follows:

"George Leonard, to 2 bushels of toll wheat.
William Natcher, to 1 bushel of wheat toll."

Q. 15. While you lived at Eberly's Mills, first as tenant and afterwards on shares, did you know Daniel Drawbaugh, of that place?

Ans. Yes, sir.

Q. 16. Did he deal with you at the mill?

Ans. Yes, sir.

Q. 17. Did he buy of you for cash or on credit?

Ans. Sometimes for cash, and other times he told us to charge it.

Q. 18. Have you, in the ledger part of the account-book, his ledger account during both the times you were at the mill?

Ans. Yes, sir.

Q. 19. Please read them, in order that the examiner may take them down as part of your answer.

Ans. They are as follows:

"11
1870.
May. Daniel Drawbaugh.

10	Dr.		Contra. c.	
P. 8.	To 5 qts. meal, - -	30	July, 1870.	
" 20.	To ¼ bus. skreanings,	22	P. 41. By bill, - - - -	1 38
" 12.	do. -	22	By do. - - - -	60
" 32.	do. -	23	By recd. from Geo. Dra, -	3 24
" 40.	do. -	37		
		1 34		5 22
" 41.	flour, -	1 88		
" 46.	flour, -	2 00		
		5 22		

1871.	Dan. Drawbaugh.		Contra.	
			Cr.	
Pag. 56.	flour, - - - -	1 00		
63.	do. and feed, - -	1 87	By making Branding Iron,	1 00
66.	do. - - - - -	1 00	" repairing Door, - - -	80
80.	Mill-feed, - - -	1 35		1 80
80.	halling done, - -	1 00	" " Bureau, - - for daughter Kate.	1 00
82.	do. do. - -	1 50		
		8 82		2 80
82.	flour, Leonards, for Carls, - - -	1 00	March 28. By cash, - - -	2 00
				4 80
		7 82	April	
	½ of holling brass,	25	15. By cash in full, - -	3 27
		$8 07		$8 07

Q. 20. I observe by this account, and the day-book pages to which it refers, that the date of the first sale to him, viz: "Five quarts of meal, thirty cents," was May 10, 1870. Have you any charge against him in your books before that?

Ans. No, sir.

Q. 21. Had you had any dealings with him before you went to Eberly's Mills, about the 1st of April, 1870?

Ans. No, sir; I never knew the gentleman until I went there.

Q. 22. Mr. Drawbaugh told us, in substance, (defendant's printed record, page 1117,) that he paid you some money before 1870. Did he ever pay you any money before 1870?

Ans. No, sir.

Q. 23. Did your son Michael live with you, and work for you, the first time you lived at Eberly's Mills, or the second time?

Ans. He worked for me both times.

Q. 24. Did he work for you in the mill either time, and if so, which?

Ans. I have a memorandum of the first time he worked for me in the mill. The first time he farmed for me.

Q. 25. Please read the memorandum.

Ans. (Witness reads from the book already referred to.) "December 15th, 1871. Michael H. Natcher commenced working with me in the *mill* for twelve dollars per month."

Q. 26. In whose handwriting is that entry, and when was it made?

Ans. My own. It was made on the day that he commenced—on the day that it is written there.

Q. 27. While you lived there, on these two occasions, did Drawbaugh do any work for your mill or yourself?

Ans. He done some little. What the account, already copied in, shows.

Q. 28. Did he used to come to the mill and see you, and talk?

Ans. Yes, sir; he came frequently. He mostly came himself for what he wanted for family purposes.

Q. 29. Did you used to go to his shop while you lived there?

Ans. Yes, sir; not so very often, but I was frequently there.

Q. 30. Did he ever show you any talking-machines while you lived there?

Ans. No, sir.

Q. 31. While you lived there, did you ever hear that he had a talking-machine?

Ans. No, sir; he never told me he had it.

Q. 32. Please look at the machines now shown you, marked "F," "B," "C,' and "I," and tell me whether you ever saw either of them while you lived at Eberly's Mills?

Ans. I can just say in a word, that I never saw any of them.

Q. 33. Please look at the machine marked "C, Reproduced," and tell me whether you ever saw a machine like that, while you lived at Eberly's Mills.

Ans. No, sir; I never did.

Cross-examination by Mr. Hill.

Cross-Q. 34. Can you take your oath that you now remember everything that Daniel Drawbaugh ever showed you while you lived at Eberly's Mills?

Ans. I can take an oath that I never saw those things.

[*Answer objected to by Mr. Hill, as irresponsive. Question repeated.*]

Ans. Yes, sir; I can.

Cross-Q. 35. Will you please tell us everything that Daniel Drawbaugh ever showed you while you lived at Eberly's Mills?

Ans. He showed me those faucets, that he told me he had invented to draw molasses and oil, &c. Then he had rams—he called them hydraulics—to raise the water out of low places. He had some little machinery that he had invented, to make nails. I don't know whether it

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had come to perfection then, or not. I didn't take much account of it. He ground apples, and pressed out cider somewhere below in his shop. That is about all that I remember.

Cross-Q. 36. Do you swear that those four things, faucets, hydraulic rams, the nail machinery, and the cider machinery, are all that Drawbaugh ever showed you while you lived at Eberly's Mills?

Ans. Yes, sir.

Cross-Q. 37. Can you take your oath that you now remember all the inventions or machines that Drawbaugh ever told you about or talked to you about while you lived at Eberly's Mills?

Ans. Yes, sir; his mind seemed to be centered on the hydraulics and the faucets, about that time. He had my horse several times to go and see about the hydraulics, up the creek and around there.

[*All the last part of the answer, including all after the words "yes, sir," objected to by Mr. Hill, as irresponsive.*]

Cross-Q. 38. Will you please name all the inventions and machines that Mr. Drawbaugh ever talked to you about while you lived at Eberly's Mills?

Ans. The faucet; he said he invented the faucet, and he was endeavoring to make out of them all he could. And as regards these hydraulics, he asked me several times if I knew any good place where they could be put in, as I was well acquainted up along the Canadaguinet creek. He said he had some in operation in York county, and he asked me if I would lend him my horse to go and see about them; I lent him the horse. He was gone over night; he started one day, and came back the next. As regards the machinery to make nails, he spoke to me several times about that. He said he endeavored to get up machinery to make nails; that he thought he could make nails there as he had the power there. As regards the grinding the apples and pressing the cider, he didn't say anything to me about that until it was in operation. He asked me to go and see it; I saw it. That is all that I know about his machinery.

Cross-Q. 39. You swear that those four things, the faucet, the hydraulic rams, the nail machinery, and the cider machine are all the inventions or machines that Drawbaugh ever talked to you about while you lived at Eberly's Mills; do you?

Ans. Yes, sir.

Cross-Q. 40. Can you swear that Drawbaugh showed you all the inventions and machines which he had in his shop while you lived at Eberly's Mills?

Ans. No; I can't swear that he did.

Cross-Q. 41. What business are you now engaged in?

Ans. I have been living retired for the last five or six years. Occasionally I help the farmers, and haul the water for the steam saw-mill.

Cross-Q. 42. Why did you retire from business; were you getting too old and feeble to continue in active life?

Ans. No, sir; I thought I had worked long enough, and that I might take the world a little easy, and so I did. I am assessed as a gentleman.

Cross-Q. 43. You have partially lost your sight and hearing, have you not?

Ans. No, sir; when a person speaks straight to me, without a cigar in his mouth, or hair around his mouth, I can hear every word he says. My sight, at a little distance off, is as good as when I was a boy; and for any fine reading, I use spectacles; but I can write my name without them.

Cross-Q. 44. How long have you used spectacles?

Ans. I don't know exactly how long. It is about seven or eight years that I have used them occasionally.

Cross-Q. 45. You have been using them here this morning during the taking of your deposition, have you not?

Ans. Yes, sir.

Cross-Q. 46. When you were about commencing your testimony this morning you particularly requested the counsel and the examiner to put the questions loudly and distinctly, so that you could hear them. Why did you do that?

Ans. I didn't say loudly.

Cross-Q. 47. What did you say?

Ans. I said firm, or something like that, and in such a way that I would ———, and for the very reason that some persons either will have a cigar in their mouth, or a moustache or hair around their mouth, and they don't speak firm. I can understand when they speak fairly and firmly. I want to understand what is said.

Cross-Q. 48. Did the examiner have a cigar in his mouth?

Ans. This gentleman; I understand every word he says—the writer.

(Question repeated.)

No, sir; he didn't have a cigar in his mouth.

Cross-Q. 49. Did Mr. Storrow have either a cigar or a moustache?

Ans. I didn't take notice whether he had or not. I understood every word that you spoke to me.

Cross-Q. 50. Didn't you sit within four feet of Mr. Storrow and the examiner?

Ans. I knew that he (Mr. Ott) was the gentleman examining me, and I wanted to hear correctly.

Cross-Q. 51. How far did you sit from Mr. Storrow and Mr. Ott while giving your testimony, and at the time you made the request to have the questions given "firm?"

Ans. About three feet from Mr. Storrow and about four from Mr. Ott, or about the same distance from both.

(At the request of Mr. Storrow, the examiner certifies that at the time the said request was made by the witness, the examiner was sitting on the opposite side of a table and about eight feet from the witness, and that the examiner moved his chair about two feet nearer to the witness. Mr. Storrow also calls attention to the fact that the examiner remarked at the time that there was considerable noise in the hall and stairway leading to the room, and the examiner further certifies that during the deposition both he and the witness leaned forward upon the table, bringing their heads nearer together, the distance then being reduced to about four feet and a half.)

[Recess for dinner, until 2.15, P. M.]

JULY 27, 1882, 2.15, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Cross-examination of William Natcher, by Mr. Hill, continued:

Cross-Q. 52. In what year were you born?

Ans. In 1816; I think that is the time I was born; I have it recorded, and I think that is what it is. I am not just so right certain about that. I think I am sixty-eight years old the 10th of October, next.

Cross-Q. 53. Have you ever been examined before as a witness in a law-suit; if so, how many and what law-suits?

Ans. I never was examined much. I don't know of any in particular just now. I was on one in Perry county—Stouffer against Stouffer was the case.

Cross-Q. 54. When was that?

Ans. About ten years ago.

Cross-Q. 55. Is that the only case you ever were examined in in court?

Ans. I think it was in the common pleas. That is all that I can remember of just now. There were several Commonwealth cases that I have been on.

Cross-Q. 56. Mention all the Commonwealth cases in which you have ever been examined as a witness, and state when and where they were tried?

Ans. One was E. J. Krause. He was the prosecutor.

Cross-Q. 57. Give the defendant's name. Who was the criminal?

Ans. I think a man by the name of Jeremiah. I disremember.

Cross-Q. 58. Is that all the Commonwealth case in which you ever were examined as a witness?

Ans. No, sir; there was another, but I can't think what the man's name is, who was the prosecutor. He prosecuted three black men for stealing apples.

Cross-Q. 59. When was that?

Ans. That was about three years ago.

Cross-Q. 60. What was Jeremiah charged with?

Ans. Charged with something about beer, either stealing beer or selling it some way—selling beer or beer kegs. It involved the kegs and the beer some way.

Cross-Q. 61. Were those two criminal cases in Cumberland county, at Carlisle?

Ans. Yes, sir.

Cross-Q. 62. Have you now mentioned all the Commonwealth cases in which you ever testified as a witness?

Ans. I am not certain whether I mentioned all, but all that I can think of just now.

Cross-Q. 63. When were you first spoken to about giving evidence in this case, and by whom?

Ans. This here is the gentleman—Mr. Storrow—about the first week in June of this year, 1882.

Cross-Q. 64. Where?

Ans. In Carlisle.

Cross-Q. 65. Give us your address in Carlisle?

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Ans. My address is "William Natcher, Carlisle, Cumberland county, Pa."

Cross-Q. 66. What street do you live on?

Ans. I live in a short alley between the market-house and Pomfert street. I formerly lived on West North street.

Cross-Q. 67. Since Mr. Storrow was there to see you the first time, how many times have you been consulted about this case?

Ans. I was only consulted once.

Re-direct by Mr. Storrow:

Q. Q. 68. Have you been working in the harvest field this summer?

Ans. Yes, sir.

Q. Q. 69. What particular part of the work did you do in harvesting?

Ans. I helped to dry the hay first, and after it was dry and turned I loaded all the hay on a large farm. I done all the loading in the field. I was on the wagon and done the building of the load. We ran two wagons. P. H. Albright, the man I was assisting, then started the reaper. The first day he put me to shocking. The reaper cut six feet, and some of the hands couldn't bind their sections; so he told me to try my hand, and I did, and bound my section after the reaper right through harvest every day. Then, when we were done with that, he said: "Natcher, you must do the building again. I did, and built all the wheat for the two wagons we ran. We were done with the sheaves then, and he had a small field that he asked me to help mow. I mowed along with a man named Samuel Gill at grass till noon, and we then hauled in the rakings, and I built then again. After that we started the separator, and I handed the loose rakings to be fed. That time amounted in all to seventeen days in succession.

Re-cross-examination by Mr. Hill.

Re-cross-Q. 70. For whom were you doing that work, and for what wages?

Ans. Peter H. Albright. The wages was considered—first, he was to pay two dollars and a half for harvest and less for other work; but he afterwards concluded to pay one dollar and a half all through, with boarding, wet days and Sundays included.

Re-cross-Q. 71. Are you still working for him?

Ans. I was yesterday, and would be to-day if I was at home. I will work for him again when I go home, unless I go with his brother, who wants me to go and haul water for the saw-mill, the same as I did before.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 27th day of July, 1882.
FRED. M. OTT, *Examiner.*

WM. NATCHER.

MICHAEL H. NATCHER being produced, affirmed, and examined, saith:

Examined by Mr. Storrow:

My age is forty-three. Residence, New Kingston, Cumberland county, Pa. Occupation, formerly a miller, now I am working on a farm.

Q. 1. Are you a son of William Natcher, who has just testified?

Ans. Yes, sir.

Q. 2. Did you work for your father at Eberly's Mills, while he ran the mill as tenant to Beetem and Eberly, in 1870?

Ans. Yes, sir; I done the farming.

Q. 3. Did you work for your father in the mill, while he run the mill for Mr. Leonard, in 1871-2?

Ans. Yes, sir; I was there from the winter on until the next spring—till the time to sow oats.

Q. 4. The memorandum in your father's book, states that you began to work for him in the mill December 15, 1871. Does that agree with your recollection?

Ans. Yes, sir.

Q. 5. While you were there at Eberly's Mills with your father, did you use to see Mr. Daniel Drawbaugh. If so, where?

Ans. Yes, sir; I saw him often in the mill, and in his mill, and I can't tell where all. I saw him every day that he was about home.

Q. 6. Look at the four instruments now on the table—"B," "F," "C," and "I"—and tell me whether or not you ever saw either of them while you were at Eberly's Mills?

Ans. No, sir; I never saw anything of that kind.

Q. 7. Did, or did not, Daniel Drawbaugh ever show you any talking-machines while you were at Eberly's Mills?

Ans. No, sir; he never did.

Q. 8. Did he, or did he not, while you were at Eberly's Mills,

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ever speak to you about talking-machines, or mention the subject to you?

Ans. No, sir; he never did.

Q. 9. Did you ever, at Eberly's Mills, see a machine like this one I now show you, marked "C, Reproduced"?

Ans. No, sir; I never saw anything like that, to my knowledge.

Q. 10. Did he ever show you, at his shop, machines or things which he said he had invented and made?

Ans. Yes, sir; he showed me some few things there. He showed me his faucet, and clock, and a few other things.

Cross-examination waived by Mr. Hill.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 27th day of July, 1882.
FRED. M. OTT, *Examiner.*

MICHAEL H. NATCHER.

Adjourned until July 28, 1882, at 10, A. M.

THEODORE GRISSINGER, being produced, affirmed, and examined, saith:

Examined by Mr. Storrow:

My age is thirty-seven; residence, Mechanicsburg, Cumberland county, Pa.; I have been in the patent-right business for the last two or three years; that is about all the business that I have now; before that I was a dealer in agricultural implements in Mechanicsburg.

Q. 1. Have you taken out patents on your own inventions?

Ans. Yes, sir.

Q. 2. How long have you lived in Mechanicsburg, or near there?

Ans. I have lived in Mechanicsburg since the spring of 1878. I have lived near there since 1872; within a mile.

Q. 3. When did you first employ Daniel Drawbaugh, of Eberiy's Mills, to do any work for you, and what was the work?

Ans. In June or July, 1869, I employed him to make me a machine for cutting and rounding straps, or leshes, for leather fly-nets, at one operation.

Q. 4. Were you interested in the fly-net business at that time; if so, where was it carried on?

*

Ans. I was not.

Q. 5. Did he get up a fly-net machine for you, and did you pay him for it; if so, how much?

Ans. He did get up the machine for me. I paid him forty dollars.

Q. 6. It has been testified that you were one of the members of the magnetic clock company, got up to patent and build magnetic clocks in accordance with Daniel Drawbaugh's plans, and that such company formed and began its operations about the 1st of April, 1878. Is that according to your recollection?

Ans. Yes, sir.

Q. 7. Who were the other members of that company?

Ans. Jacob H. Grissinger, who is my brother, and J. E. Shettel, who is my brother-in law, and Mr. Drawbaugh, were the firm, with me.

Q. 8. Do you remember having a conversation with Mr. Drawbaugh at the shop at Eberly's Mills about telephones after the clock company started, and during the spring or summer of 1878?

Ans. I do.

Q. 9. Will you tell me whereabouts in the shop, and on which story you and Mr. Drawbaugh were when you had that conversation, and in doing so you may refer to the diagram No. 3 of Mr. Drawbaugh's deposition, on page 923 of defendant's printed record.

Ans. There was a basement to the building, and counting that, it would be the third story. It was about the center, or near the center of the west room—near the letter F on the diagram. This partition was not here, or only part of that short partition was there.

Q. 10. Were you and Mr. Drawbaugh engaged in working at a bench at the time, or what were you doing?

Ans. He was sitting on a trestle.

Q. 11. Was there anybody else on that story at the time. If so, who, and where were they?

Ans. My brother and Mr. Shettle were in the room part of the time.

Q. 12. Where were they the rest of the time?

Ans. They were in the southeast room part of the time.

Q. 13. At the time of that conversation, had you, or had you not, read about telephones in the newspapers, and what newspapers were you in the habit of reading?

Ans. I had heard of them. I was a subscriber to the Scientific American.

Q. 14. Did you make any inquiries of Mr. Drawbaugh, or remarks to him, with relation to telephones at that interview. And if so, state the nature of the first inquiry or remark you addressed to him on that subject?

Ans. I did. I asked him why he had not invented the telephone, saying, in a jesting way, that it would have paid better than electric clocks.

Q. 15. Did he make any reply to that inquiry, and if so, what?

Ans. He did. He said he had done something in that way.

Q. 16. Did that lead to any further inquiry by you? If so, please state it.

Ans. It did. I asked him what he had done.

Q. 17. What led you to make further inquiry about it. What did you want to ascertain?

[*Objected to by Mr. Hill, as immaterial and incompetent.*]

Ans. I thought it was a pretty good thing, if he had invented the telephone. If he had done enough, far enough back, I would have went in with him.

[*Last clause of the answer further objected to by Mr. Hill, as mere opinion and not fact, and as based upon the witness' opinion in a matter of which he was not qualified to judge.*]

Q. 18. If, in reply to your inquiry, he made any statement as to what he had done far enough back, or as to whether he had anything to show that he had done something in that way, please state what he said?

Ans. He said—he told different things he had done, but could show nothing, nor give any dates for what he had done.

[*All after the word "but" objected to by Mr. Hill, as mere opinion.*]

Q. 19. If he had shown you anything tangible, or given you any dates, would you have taken any action thereupon, or would your action have been influenced thereby?

[*Objected to by Mr. Hill, as hypothetical, calling for mere opinion, and incompetent.*]

Ans. It certainly would.

Q. 20. In what respects would your action have been influenced?

[*Same objections.*]

Ans. I would have examined the matter more closely. I would have investigated the matter, to ascertain whether he had done anything far enough back to sustain a claim of priority of invention.

Q. 21. Please state whether or not the statements he then made to you left a distinct impression on your mind as to whether he had or had not done enough far enough back to entitle him to claim the invention?

[*Same objections.*]

Ans. It did.

Q. 22. State what impression it made on your mind at the time in that respect?

[*Same objections.*]

Ans. I was entirely satisfied from what he told me that he had no claim.

Q. 23. Did he or did he not at that interview claim that he was entitled to be considered as the first inventor of the telephone?

Ans. He didn't claim to be.

Q. 24. At the time of this conversation, had you or had you not read about phonographs in the newspapers?

Ans. I had.

Q. 25. Did he speak to you also about phonographs at this conversation, as well as telephones?

Ans. Yes, sir; he did.

Q. 26. If at this interview he said anything about having experimented himself with phonographs, you may state what he said upon that subject.

Ans. He said he had experimented and had made a phonographic instrument.

Q. 27. While you were connected with the clock company were you in the habit of seeing him and of going to his shop at Eberly's Mills?

Ans. I was; yes, sir.

Q. 28. Did he ever have a telephone with him at your store in Mechanicsburg, while you were connected with the clock company?

Ans. Yes, sir.

Q. 29. Had you, before that time, seen the same, or a similar instrument, at the shop at Eberly's Mills?

Ans. I had; yes, sir.

Q. 30. When you first saw it at Eberly's Mills was it connected up with wires ready to talk, or was it lying on the bench unconnected, or what condition was it in?

Ans. It was a single instrument. It was not connected with any wires. I think he got it out of his case.

Q. 31. Did you ever talk through a speaking telephone, or hear anybody talk through one, at Eberly's Mills?

Ans. No, sir; I did not.

Q. 32. Did you ever know of there being a pair of telephones connected up at the shop at Eberly's Mills while the operations of the clock company were going on there, and if so, during what part of the time?

Ans. During the latter part of the time there was a pair connected so he said. I didn't speak through them, neither did I examine it.

Q. 33. Did you understand whether he was, or was not, attempting to get up improvements in telephones, while the operations of your company were going on?

Ans. Yes, sir; he was talking of improving them, or making improvements.

[Recess for dinner, until 2, P. M.]

JULY 28, 1882, 2, P. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Examination of Theodore Grissinger, by Mr. Storrow, continued.

Q. 34. Did Mr. Drawbaugh, at the interview you have particularly described, at his shop, or at any other time, tell you whether he had ever tried a telephone on any line of wire leading outside of his shop, and if so, what did he tell you about it?

Ans. He told me that he had a line running from his shop to his dwelling-house.

Q. 35. Did he tell you whether he had ever tried to transmit speech over it, and with what result?

Ans. He did try to transmit speech, and could, by speaking very loud, hear a noise, but could not understand anything.

Q. 36. Did he tell you this at the interview at his shop already described, or at some other time?

Ans. At this interview.

Q. 37. I will now show you the various instruments which have been put in evidence by Mr. Drawbaugh, and ask you if you recognize any of them as being the same instruments, or like the instruments, which you saw during your connection with the clock company?

Ans. Here is one marked "D" that I think I saw at his shop. This one marked "E" I think he showed me at my office in Mechanicsburg, or one like it. Those are the only two that I ever seen.

Q. 38. Did you ever see, while you were connected with the clock company, either of these three larger ones, "H," "J," or "P?"

Ans. I did not.

Q. 39. Did your brother or Mr. Shettel take part in the conversation you have described at Drawbaugh's shop, either as speaking in it or listening to it?

Ans. They listened to it partly; I do not remember that they took any part in it.

Cross-examined by Mr. Hill:

Cross-Q. 40. How long did that conversation last?

Ans. It lasted probably a half hour, perhaps an hour.

Cross-Q. 41. Can you swear that it lasted over ten minutes?

[*Objected, by Mr. Storrow, that it does not appear from the question whether it refers to the conversation on telephones, or to all the conversation of the day.*]

(Question withdrawn.)

Cross-Q. 42. Can you swear that the conversation on telephones, which you say took place at the shop, lasted over ten minutes?

Ans. I think it did.

Cross-Q. 43. Is your recollection clear enough to swear positively that it did?

Ans. Yes, sir.

Cross-Q. 44. Can you repeat the conversation in the words in which it took place?

Ans. I cannot.

Cross-Q. 45. What was the date of that conversation?

Ans. I do not know the exact date.

Cross-Q. 46. Appromimate it as nearly as you can.

Ans. I think it was during the summer of 1878.

Cross-Q. 47. The first or last part of the summer?

Ans. It might have been the latter part. I think it was the latter part.

Cross-Q. 48. What work was going on in the shop at the time?

Ans. There was no work going on at the time of this conversation.

Cross-Q. 49. What time of day was this conversation?

Ans. I don't know.

Cross-Q. 50. Were your brother and Mr. Shettel present, and in hearing, when you began the conversation?

Ans. I am not positive.

Cross-Q. 51. Was anything besides telephones and phonographs talked about during that conversation?

Ans. Not to my recollection.

Cross-Q. 52. When did Mr. Drawbaugh say he invented the phonographic device?

Ans. He didn't know.

Cross-Q. 53. Did he say it was a long time before?

Ans. He said it was some time before. He couldn't give me any dates, or any time.

Cross Q. 54. Did he say it was some years before?

Ans. Yes; he intimated that it was some years.

Cross-Q. 55. Did he say anything about having done anything on that phonograph principle recently?

Ans. I think not.

Cross-Q. 56. Did he say whether he had invented the telephone, or the phonograph first?

[*Objected to by Mr. Storrow, for the reason that the witness has not testified that Mr Drawbaugh said that he had invented the telephone; but only that he had done something towards it.*]

Ans. He didn't say.

Cross-Q. 57. Did he say whether the telephones on which he had worked were able to convey spoken speech, or whether he or anybody else had ever talked through them, or not?

Ans. He said he had talked through them, but could not be understood.

Cross-Q. 58. When did he tell you that?

Ans. At this conversation referred to.

Cross-Q. 59. Did he tell you that he had ever talked through them and had been understood, or that he had ever heard anybody talk through them, and had understood what was said?

Ans. No, sir.

Cross-Q. 60. Can you give his words on that subject of having tried to talk through them, and not being able to understand?

Ans. Not his entire words in the conversation I couldn't.

Cross-Q. 61. Can you testify to anything more than your present recollection of what your impressions were at the time?

Ans. My impression that I received from him at that conversation. That is all—impressions received at that time, from what he told me.

Cross-Q. 62. Were you acquainted with the construction and mode of operation of the electric telephone at that time?

Ans. I was slightly acquainted with it—yes, sir; although I never made a close examination of them at that time.

Cross-Q. 63. What did you know about their construction and mode of operation at that time?

Ans. I knew nothing more than what I had read—the descriptions of them—in papers.

Cross-Q. 64. Of what telephones had you read the descriptions at that time, and in what papers?

Ans. I can't say at this time.

Cross-Q. 65. State just what you did know about the construction of telephones at that time?

Ans. That would be very hard to do.

Cross-Q. 66. Did you know whether they operated on a closed or open circuit?

Ans. I really do not know. I suppose I did.

Cross-Q. 67. Do you know now? If so, please state.

Ans. They are operated with a closed circuit.

Cross-Q. 68. Did you know, at that time, whether they contained an electro-magnet, and for what purpose?

Ans. I knew that they had a magnet, but did not know for what purpose. I may have known, but paid little attention to the construction of them.

Cross-Q. 69. I suppose you didn't, in that conversation, ask Mr. Drawbaugh how his telephones had been constructed, did you?

Ans. Not to my recollection.

Cross-Q. 70. Did you, at the time of that conversation, know the date of Alexander Graham Bell's telephone patents, or the time at which he claimed to have made his invention?

Ans. I don't think I knew, at that time, of the exact date.

Cross-Q. 71. Was anything said, in that conversation, about the date of Bell's invention?

Ans. I don't think there was.

Cross-Q. 72. Did you ask Mr. Drawbaugh, in that conversation, if he had any telephone instruments at that time, that he had made?

Ans. Yes; I did.

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Cross-Q. 73. Can you give his reply to that question?

Ans. He said he didn't have any.

Cross-Q. 74. Did you ask him whether he had been doing anything recently on the subject of telephones?

Ans. My previous answer referred to telephones that he had constructed before that. He did have the telephones on the line to his house. My answer was in reference to those old machines that he had made in his early experiments. I wanted to see what he had to show. I knew that he had improvements of his invention, or what he claimed to be such.

Cross-Q. 75. Did he tell you that that line from the shop to his house was one of his early experiments?

Ans. Yes, sir; it was one that he claimed was one of his first experiments.

Cross-Q. 76. Did he mention any other early experiment, except that line to his house?

Ans. I think he spoke of communicating from one room to another in the shop; but that was the most important one—from the shop to the house.

Cross-Q. 77. Did he say that he had been able to talk from one room to another, in the shop, by means of his telephones, in those early experiments, so as to be understood?

Ans. Not in his early experiments.

Cross-Q. 78. The object of your inquiries, I suppose, was to get at the time of his first experiments, and find out what he did in those first experiments in order to get at the date of his original invention; was it not?

Ans. My object was to know or find out whether he had done enough, far enough back, to sustain a claim of priority of invention.

Cross-Q. 79. Did you tell him, at the time, that such was your object?

Ans. I don't know that I did.

Cross-Q. 80. Was the conversation directed to anything except his earliest experiments?

Ans. I don't know. The conversation was all he had done in his experiments—of course, his early experiments. I cared nothing about his improvements that he was making at that time.

Cross-Q. 81. Can you give the exact language of the questions which you asked him?

Ans. I asked him what he had done; and, to prove what he had done, whether he had any instruments, witnesses, or dates to prove what he had done.

Cross-Q. 82. You mean, what he had done in his early experiments; do you?

Ans. Any of his earlier experiments; anything that he had done up until the time of these improvements.

Cross-Q. 83. I don't think you understood my question, which was, whether you can now give the exact words in which you made the inquiry?

Ans. The exact words to the letter would be impossible at this time. Those questions I asked him, but whether it was in those exact words, I do not know; it may have been a few words more.

Cross-Q. 84. Was anything said in that conversation about his recent improvements on the telephone?

Ans. I do not know that there was; I suppose there was.

Cross-Q. 85. Did he tell you how long he had been at work on his improvements?

Ans. No, sir.

Cross-Q. 86. Did he tell you how many improvements he had made since his earlier experiments, or what results he had accomplished?

Ans. He didn't say what number of improvements. His claim was that he made a more simple and cheaper instrument.

Cross-Q. 87. Did he tell you whether he had been working a great deal on improvements, or not?

Ans. He didn't claim to be working much on improvements.

Cross-Q. 88. I didn't ask what he didn't tell you, but what he did tell you. What did he say about the amount of work he had done on improvements?

Ans. He didn't say.

Cross-Q. 89. For aught you know, then, his so-called improvements that he referred to may have been going on four or five years, at that time, may they not?

Ans. My impression was that they were quite recent.

Cross-Q. 90. I did not inquire for your impression, but your knowledge. For aught you know, and for aught he told you in that conversation, his so called improvements may have been then going on four or five years, may they not?

Ans. The instruments he showed me, with what he claimed were improvements, were made within a year.

Cross-Q. 91. I did not ask about any particular instrument, but about all that he referred to as improvements, and I now repeat the question.

[*Question objected to by Mr. Storrow as having already been fully answered in several forms.*]

Ans. Do you mean improvements on other telephones?

Cross-Q. 92. It seems impossible that my question can be misunderstood, and if you got no clearer idea of Mr. Drawbaugh's statements than you do of my questions, I do not wonder at your testimony. But I will endeavor to make myself plain. For aught you know, and for aught he told you in that conversation, his so-called improvements on telephones may have then been going on for four or five years, may they not?

[*Preamble to the question objected to by Mr. Storrow, as improper and uncalled for.*]

Ans. The improvements referred to he claimed were improvements on the Bell telephone, and made since the patent was granted to Bell, and consequently could not have been going on five or six years. I can't make myself any plainer.

Cross-Q. 93. Did he say, in that conversation, that the improvements were improvements on the Bell telephone, and made since the Bell patents were granted?

Ans. I think he did.

Cross-Q. 94. Do you swear that he did so state?

Ans. I couldn't swear positively that he stated that.

Cross-Q. 95. If you remember what he did state, please give it, and if you don't remember, please refrain from giving an imaginary statement.

Ans. Are those questions now of that conversation that we had entire, or of all the conversations that we have had with regard to telephones?

Cross-Q. 96. My question refers to that conversation. I have mentioned no other, and I now repeat the question.

Ans. I have given about what transpired at that conversation.

Cross-Q. 97. You have stated, in your ninety-second answer, that "the improvements referred to he claimed were improvements on the Bell telephone, and made since the patent was granted to Bell." And in your ninety-fourth answer, you state that you can't swear positively that he said that. I am unable, in view of those answers, to determine what transpired in that conversation. And now I ask you to state just what Mr. Drawbaugh said on that subject, and all he said, which you can swear to positively.

Ans. That did not occur at that conversation we had in the shop with regard to telephones.

Cross-Q. 98. For aught that occurred in that conversation in the shop, may not Mr. Drawbaugh have been then working on his so-called improvements four or five years?

[*Objected to by Mr. Storrow, as asking for mere opinion, inference, or guess, and as not asking the witness either for his recollection of what was or was not said, or for his recollection of the impression then made upon him.*]

Ans. Not from what he told me.

Cross-Q. 99. What did he tell you to the contrary in that conversation?

Ans. We were speaking of his original inventions, and not of any improvements on other telephones.

Cross-Q. 100. (Question ninety-nine repeated.)

Ans. That was not the subject.

Cross-Q. 101. In my ninety-eighth question I asked you: "For aught that occurred in that conversation in the shop, may not Mr. Drawbaugh have been then working on his so-called improvements four or five years?" To which you replied: "Not from what he told me." If you know a single word that he told you, to the contrary, in that conversation, tell it.

Ans. When I asked him what he had done, whether he had any instruments, any dates, or any witnesses to prove what he had done, he said he had not. And if the improvements would have been going on for a period of five or six years, he certainly would have mentioned it.

[*Answer objected to by Mr. Hill, as not responsive, but mere argument.*]

Cross-Q. 102. (Cross-question one hundred and one repeated.)

[*Question objected to by Mr. Storrow, because it has been frequently and fully answered.*]

Ans. I can't answer that question more fully than I have.

Cross-Q. 103. Did he tell you that he had not been working on those improvements at least four or five years, at that time?

Ans. No, sir.

Cross-Q. 104. Did he tell you, at that time, how long he had been working upon them?

Ans. No, sir.

Cross-Q. 105. Then your supposition at that time, that he had been working on them only recently, was a mere inference of your own, was it?

Ans. It was not entirely so.

Cross-Q. 106. If he didn't tell you how long he had been working upon them, which you say is the fact, how did you know, except by inference?

Ans. I gathered the facts from the general conversation that was had on the subject.

Cross-Q. 107. I want to separate the facts from the inferences. You say that it is a fact that he didn't tell you how long he had been working on these improvements. How, then, did you know, except by inference?

Ans. I only know, when I asked him for the proofs of his work, he didn't have them. And my mind was so completely and entirely made up at the time of this conversation, that he had no claim, that I paid very little attention to it thereafter.

Cross-Q. 108. The proofs that you asked him for, were proofs of his earlier experiments, were they not?

Ans. Any proofs that would go to sustain a claim of priority of invention.

Cross-Q. 109. But you have testified in answer seventy-nine, that you don't know that you told him that you wanted to know whether he had done enough, far enough back, to sustain a claim of priority of invention. And in answer eighty, you have testified: "The conversation was all he had done in his experiments—of course, his earlier experiments. I cared nothing about his improvements that he was working at that time." Did you ask him for any proofs, except the proofs of his earlier experiments?

Ans. I asked him for proof of his experiments. I specified no particular experiments.

Cross-Q. 110. Was the conversation at that time on the subject of priority of invention?

Ans. Yes, sir.

Cross-Q. 111. Did you tell him that that was what you wished to ascertain?

Ans. I asked him the question.

Cross-Q. 112. What question?

Ans. What he had done.

Cross-Q. 113. Done when?

Ans. Any time prior to that, was my question that I wanted to know.

Cross-Q. 114. And in reply to that he said that he had no machine to show, did he?

Ans. He then related his experiments.

Cross-Q. 115. Did he, at that conversation, show you a telephone?

Ans. I am not positive whether it was at that conversation, or whether it was since that that he showed me one similar to this instrument "D" here.

Adjourned until July 29, 1882, at 10, A. M.

JULY 29, 1882, 10, A. M.

Examination resumed pursuant to adjournment.

Present: Mr. Storrow for complainants, and Mr. Hill and Mr. Jacobs for respondents.

Cross-examination of Theodore Grissinger, by Mr. Hill, continued.

Cross-Q. 116. Then you do not remember seeing any telephones at the time of that conversation, do you?

Ans. It is possible that he showed me the one I referred to; that is, the one I have already identified.

Cross-Q. 117. I wish to clearly distinguish fact from mere guesswork. Can you swear that he showed you a telephone at the time of that conversation?

Ans. I could not swear positively. It was then or soon after.

Cross-Q. 118. Had he ever shown you a telephone before that conversation, or had you ever seen one about the shop before that conversation?

Ans. I think not.

Cross-Q. 119. How long after that conversation did he show you a telephone, and where was it?

Ans. I can't say how long afterwards. It was either in the western room referred to, or in the south-eastern room.

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Cross-Q. 120. How do you fix the time of that conversation as being in the latter part of the summer of 1878?

Ans. I only know it was soon after we started in the business.

Cross-Q. 121. At what time did you start in the business?

Ans. It was in the spring of 1878?

Cross Q. 122. Did you start in the business about the beginning of April, 1878?

Ans. There may have been something done in the early part of April, but very little.

Cross-Q. 123. Do you remember the fact of an application being prepared by Mr. Weaver for a patent on the Drawbaugh magnetic clock?

Ans. Yes, sir. If I am allowed, in that other question where I said "the early part of April," I prefer to say "in April," for there was very little done in April.

Cross Q. 124. Did you interview Mr. Weaver several times in company with your brother, Mr. Shettel, Mr. Drawbaugh, or any of them?

Ans. I spoke to him at different times in regard to the clock.

Cross-Q. 125. Did you visit his office in company with any of the gentlemen referred to in my last question?

Ans. Yes, sir.

Cross-Q. 126. How many times?

Ans. I don't know.

Cross-Q. 127. Was that conversation at the shop before or after the preparation of the application, by Mr. Weaver, for the patent on the magnetic clock?

Ans. I am not positive, but think it was before.

Cross-Q. 128. Referring, now, to the first time when you have any *positive* recollection of seeing a telephone at Mr. Drawbaugh's shop, was that the telephone marked "D," which is here in evidence?

Ans. It is my impression that it is, or one like it.

Cross-Q. 129. How do you identify it. Do you recognize the curled magnet on the back?

Ans. I recognize it from its shape, and by the curled magnet.

Cross-Q. 130. How happened you to see it at that time?

Ans. He showed it to me.

Cross-Q. 131. What was he doing with it at that time?

Ans. He was showing it to me.

Cross-Q. 132. Where did he get it, when he showed it to you?

Ans. I do not remember where he got it.

Cross-Q. 133. What did he do with it, after he had shown it to you?

Ans. I don't know.

Cross-Q. 134. Did you take it in your hands and examine it?

Ans. It is possible that I did.

Cross-Q. 135. I want to caution you again against giving mere guesswork in your answers. What I want to know is, whether you have any recollection of taking it in your hand and examining it at that time, when he first showed it to you?

Ans. I have no distinct recollection of having it in my hand at that time.

Cross-Q. 136. What did he say about it, at that time?

Ans. He explained its construction.

Cross Q. 137. Did he tell you it was one of his early experiments, or one of his so-called improvements?

Ans. It was one of his improvements.

Cross-Q. 138. Did you ever see it again after that; if so, when and where?

Ans. I saw it, or one like it, frequently afterwards in the shop. That word "frequently" you might leave out. I saw it afterwards in the shop.

(Defendant's counsel asks that it be taken down just as the witness said it.)

Well, say "frequently," then.

Cross-Q. 139. How far did you live from the shop during all the time of your connection with the clock business?

Ans. About six miles.

Cross-Q. 140. During all that time, how often were you at the shop?

Ans. I don't know.

Cross-Q. 141. Were you there every day?

Ans. No, sir.

Cross-Q. 142. Did your visits to the shop average as many as one in every two weeks?

Ans. From the time we articled until the time when we sold out?

Cross-Q. 143. I mean, during the time that the clock business was actually going on there at the shop?

Ans. They averaged more.

Cross-Q. 144. Did they average as many as one every week?

Ans. They averaged more.

Cross-Q. 145. Did they average as many as two every week?

Ans. I think they did.

Cross-Q. 146. You say that Mr. Drawbaugh showed you the instrument "D" at the shop, and tried to explain its construction to you. Did he ever afterwards show you that instrument, or say anything about it to you?

Ans. In the shop?

Cross-Q. 147. In the shop; yes.

Ans. He showed me the instrument, but said nothing about it to me in particular.

Cross-Q. 148. How happened he to show you the instrument afterwards again?

Ans. He showed it to me in a casual way, as he would show me any other instrument or machine.

Cross-Q. 149. When he showed it to you in that casual way, what did he say about it?

Ans. I could not say at this day. My mind was so entirely made up, that I paid very little attention to it afterwards—made up from what he told me at our first consultation.

Cross-Q. 150. How many times did he show it to you casually, at the shop?

Ans. I don't know.

Cross-Q. 151. At the time you speak of, when he showed it to you casually, did he show you any other telephone besides "D"?

Ans. No, sir; I think not.

Cross-Q. 152. Did you ever see any other telephone except "D," in the shop?

Ans. I think I saw this one, marked "E."

Cross-Q. 153. When did you first see that one, marked "E," at the shop?

Ans. I couldn't say.

Cross-Q. 154. How long was it after you had first seen "D"?

Ans. I am not positive that I saw it in the shop at all.

Cross-Q. 155. Did you never see the glass tumbler, or tin can instruments marked "F" and "B," in the shop?

Ans. I did not.

Cross-Q. 156. May they not have been there all the time, while the clock business was going on?

Ans. Openly, or locked up?

Cross-Q. 157. May they not have been there in the shop?

Ans. They might have been there, concealed.

*

Cross-Q. 158. May you not have seen them there, and forgotten it?

Ans. No, sir.

Cross-Q. 159. You swear to that positively, as a fact, do you?

Ans. To the best of my knowledge and belief, I did not see them there.

Cross-Q. 160. What I mean is this; do you swear to it as a positive fact, that if you had seen them there, you would not have forgotten the circumstance?

Ans. I don't think I would have forgotten it.

Cross-Q. 161. But you don't state that to be the positive fact, but only your present opinion and belief. Is that what you mean to testify?

Ans. I think it is a fact.

Cross-Q. 162. Do you swear to it as a fact?

[*Objected to by Mr. Storrow, that the question has been fully answered; and now comes to be a mere metaphysical discussion.*]

[Mr. Hill replies, that it has not been answered; that he wishes to separate fact from opinion; and to find out how far this witness is willing to swear to matters as fact, and how far he is willing to admit that they are only matters of opinion and belief.]

Ans. Yes, sir.

Cross-Q. 163. Now, then, I want to know how you are able to swear to it as a fact, that you could not have seen those instruments there, and forgotten the circumstance. Do you never forget anything?

Ans. I was very much interested in the matter, when he said that he had been experimenting in telephones, and if I would have seen them there, I certainly would not have forgotten it.

Cross-Q. 164. That is merely your present opinion and belief about the matter; is it not?

Ans. It is from my knowledge of myself.

Cross-Q. 165. Have you not testified repeatedly, in substance, that after that first conversation you paid very little attention to Drawbaugh's telephones?

Ans. After that first conversation? Yes, sir.

Cross-Q. 166. May you not have seen those two instrument, "F" and "B," there at the shop, after that first conversation, and have forgotten the circumstance?

Ans. No, sir; I think not.

Cross-Q. 167. Did you never see the instruments "C" and "I" there at the shop, after that first conversation?

Ans. No, sir.

Cross-Q. 168. Can you swear that they were not both at the shop during all the time that the clock operations were going on?

Ans. They might have been concealed.

Cross-Q. 169. Did you never see an instrument similar to "C Reproduced," there at the shop, after that first conversation?

Ans. I did not.

Cross-Q. 170. Did you ever see the instrument "H" there at the shop after the first conversation?

Ans. No, sir.

Cross-Q. 171. Can you swear that it was not there all the time during the operations of the clock company?

Ans. Not openly.

Cross Q. 172. Did you ever see a telephone instrument of Mr. Drawbaugh's having two cords attached to it, one cord being of a bright red, and the other of a bright green color? This question does not relate to the shop, but anywhere. Did you ever see such an instrument?

Ans. Do you mean a cord of wire?

Cross-Q. 173. It had wire inside of it, but it was covered with thread. One side was bright red, and the other was bright green?

Ans. I do not remember.

Cross-Q. 174. I refer to the instrument marked "N;" did you ever see that instrument?

(Witness examines instrument "N.")

Ans. Not to my recollection.

Cross-Q. 175. Is not that the instrument which Mr. Drawbaugh showed you at Mechanicsburg, as you have testified?

Ans. I think not.

Cross-Q. 176. Are you able to swear positively that it is not?

Ans. I couldn't swear positively, but I think it is not.

Cross-Q. 177. Please look at the instruments "A," "G," "K," "J," "L," "M," "N," "O," and "P," and state whether you ever saw them or any of them at the shop after that first conversation?

Ans. This instrument, (indicating "A,") I have seen somewhere, but I can't place it. I may have seen it there. The others I didn't see any of.

Cross-Q. 178. Referring to the instruments "G," "J," "K," "L," "M," "N," "O," and "P," are you able to swear that they may not have been at the shop all the time during the clock company's operations there?

Ans. Not openly.

Cross-Q. 179. When you visited the shop once or twice a week during the operations of the clock company, what did you visit it for. Did you take any part in the work there?

Ans. I was interested in the clocks, and wanted to see what was done.

Cross-Q 180. Did you do any manual work there, yourself?

Ans. No, sir.

Cross-Q. 181. Were you running your store, at Mechanicsburg, all the while?

Ans. Yes, sir.

Cross-Q. 182. How long were you in the habit of staying at the shop, on your visits there?

Ans. From one to three, four, or five hours.

Cross-Q. 183. Did you stay in the shop all the time, or were you around the village?

Ans. I was in the shop.

Cross-Q. 184. Did Drawbaugh ever show you a telephone instrument at Mechanicsburg, more than once?

Ans. Not to my recollection.

Cross-Q. 185. Where did he have the instrument then? Was he carrying it in his pocket?

Ans. I think he took it out of his coat pocket.

Cross-Q. 186. What did he say about it at the time?

Ans. I think he told me he was going to take it and show it to Mr. Thomas.

Cross-Q. 187. What Mr. Thomas?

Ans. R. H. Thomas, who lives in Mechanicsburg, and edits "The Farmers' Friend," "Saturday Evening Journal," and "Cumberland Valley Independent," and another paper that I do not know the name of. At least, I think he edits another. No, I guess I am mistaken, and there are only three.

Cross-Q. 188. When were the operations of the clock company discontinued?

Ans. I think I sold out some time in the early part of 1880.

Cross-Q. 189. To whom did you sell?

Ans. E. W. Chellis.

Cross-Q. 190. When were the manufacturing operations of the clock company discontinued?

Ans. I can't give the exact date.

Cross-Q. 191. Was it not early in 1879?

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Ans. It was some time in 1879, but I can't give the time.

Cross-Q. 192. Were you at the shop as often as once or twice a week, clear up to the time when the manufacturing operations were discontinued, or only a part of that time?

Ans. The greater part of that time?

Cross-Q. 193. When were you last at the shop?

Ans. I do not know. I couldn't give the date.

Cross-Q. 194. Have you been there since the company's manufacturing operations were discontinued?

Ans. No, sir.

Cross Q. 195. Which member of the clock company was at the shop most frequently during the operations of the clock company?

Ans. I do not know.

Cross-Q. 196. Which member of the company had, to the geatest extent the confidence of Mr. Drawbaugh?

Ans. I do not know that any particular one had his confidence.

Cross Q. 197. Did you ever have any reason to believe that you did not have his confidence?

Ans. No, sir.

[Recess for dinner, until 2, P. M.]

JULY 29, 1882, 2, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Cross-examination of Theodore Grissinger, by Mr. Hill, continued:

Cross Q. 198. How many times during the continuance of the clock company's operations, did you have any conversations with Mr. Drawbaugh, about his telephones, which you can now distinctly remember?

Ans. I remember distinctly of two.

Cross-Q. 199. Is that all that you have a distinct recollection of?

Ans. We had more. But those are the only ones that I can distinctly remember.

Cross-Q. 200. Was one of those two conversations the conversation that took place at Mechanicsburg, when he showed you the instrument there?

Ans. Yes, sir.

Cross-Q. 201. Tell us all you remember of that conversation at Mechanicsburg?

Ans. He showed me the instrument; showed me what improvements he claimed on it, and said he was going to show it to Mr. Thomas.

Cross-Q. 202. Do you recollect what the improvements were that he claimed on it?

Ans. I do not.

Cross-Q. 203. Have you given all of that conversation now, that you can remember?

Ans. All I can remember.

Cross-Q. 204. Was that conversation in your store?

Ans. Yes, sir.

Cross-Q. 205. In what part of the store?

Ans. In the front part.

Cross-Q. 206. Who was present, besides yourself and Drawbaugh?

Ans. No one.

Cross-Q. 207. Did you ever have a conversation in your store, at Mechanicsburg, with Mr. Drawbaugh on the subject of telephones, at which anybody was present, except yourself and him?

Ans. I think not.

Cross-Q. 208. The first conversation, which you described, with Mr. Drawbaugh, to wit: the conversation at which you asked him about the dates of his earlier experiments, &c., was the other conversation, which you say you distinctly remember; was it not. That is to say, the two conversations, which you say you distinctly remember, were the one at the shop, in which you asked him about the date of his early experiments, and the other at your store, at Mechanicsburg, in which he mentioned that he was going to show the machine to Mr. Thomas; am I correct?

Ans. Those were the two conversations; yes, sir.

Cross-Q. 209. You say that at one time, after the first conversation at the shop, he showed you the machine "D," and tried to explain it's construction. I suppose you do not distinctly remember what that conversation was; do you?

Ans. I said that I was not positive that he showed me an instrument at that time, or whether it was some time afterwards.

Cross-Q. 210. Assuming that it was some time afterwards, then what I want to know is, whether you distinctly remember the conversation that took place at that time when he did show it to you?

Ans. I do not.

Cross-Q. 211. Do you remember anything about it, except that he showed you the machine and tried to explain its construction to you?

Ans. I only know that he showed it to me and explained the improvements that he claimed to have made.

Cross-Q. 212. Do you remember what those improvements were?

Ans. No, sir; his main claim was its simplicity of construction and cheapness of manufacture.

Cross-Q. 213. You understood that I was not inquiring about the conversation at Mechanicsburg, but about the conversation at the shop in which he showed you the machine; did you?

Ans. It was at one of the conversations at the shop.

Cross-Q. 214. But you don't remember whether it was at the first conversation at the shop, about which you have testified, or whether it was at a subsequent conversation at the shop, if I understand you?

Ans. I think it was at a subsequent conversation.

Cross-Q. 215. Do you recollect any other particular conversation with Drawbaugh about telephones, except the three that you have specified, to wit: the first conversation in which you asked the date of his earlier experiments, the conversation at Mechanicsburg, and the possible other conversation in which he showed you the machine "D?"

Ans. I could not specify any other particular conversations.

Cross-Q. 216. Did you ever see any of Drawbaugh's telephone machines away from his shop, except on the occasion at Mechanicsburg, of which you have testified, until you saw these machines here at this house during the taking of this deposition?

Ans. Yes, sir.

Cross-Q. 217. Where and when?

Ans. In Mechanicsburg, about ten days or two weeks ago.

Cross-Q. 218. Who showed them to you there?

Ans. This gentleman; Mr. Storrow, I believe is his name. My former answer should be "similar machines." I do not know that they were Drawbaugh's. They were similar to the machines that were shown me here.

Cross-Q. 219. Is that the only time that you ever saw any of Mr. Drawbaugh's machines away from his shop, except on the one occasion at Mechanicsburg when Mr. Drawbaugh showed you a machine, and here during the taking of this deposition?

Ans. I think so.

Cross-Q. 220. When Mr. Storrow showed you the machines at Mechanicsburg recently, did you examine them carefully?

Ans. I did.

Cross-Q. 221. Will you please look at the machines from "A" to "P," inclusive, both original and re-produced, that are here in evidence, and point out which of those machines Mr. Storrow showed you at Mechanicsburg, if they are the same machines which he showed you; and if he only showed you copies or re-productions, point out which are the machines of which he showed you copies or re-productions.

Ans. I could not point out all the machines which he showed me. There were some which I understood him to say were copies. I could not say what ones they were.

Cross-Q. 222. How many machines did he have there, and show you?

Ans. I don't know; I didn't count them.

Cross-Q. 223. Did he have this machine, "H," there, or one like it?

Ans. Yes, sir.

Cross-Q. 224. Did he have this machine, "J," there, or one like it?

Ans. Yes, sir.

Cross-Q. 225. Did he have this machine, "A," there, or one like it?

Ans. Yes, sir.

Cross-Q. 226. Did you tell him that you had seen that machine, "A," before, or one like it?

Ans. No, sir.

Cross-Q. 227. At that first conversation with Drawbaugh at the shop, was he sitting or standing?

Ans. Sitting.

Cross-Q. 228. Do you recollect whether Mr. Shettel, or your brother took any part in the conversation at all?

Ans. I think they were present part of the time.

Cross-Q. 229. What I mean is, did they take any part in the conversation?

Ans. They took no particular part. They may have spoken a word or two.

Cross-Q. 230. Did Drawbaugh get up from his seat during the conversation, or did he remain sitting all the while?

Ans. He may have got up. We were sitting the greater part of the time.

Cross-Q. 231. Have you any recollection of his getting up from his seat during the conversation?

Ans. I am not certain that he got up.

Cross-Q. 232. What were your brother and Mr. Shettel doing, during that conversation?

Ans. I cannot say.

Cross-Q. 233. What was the first work that the clock company did, when they began to occupy the shop? Was it to make changes in the partitions, to accommodate their expected business?

Ans. Yes, sir; They made changes in the partitions.

Cross-Q. 234. Does the diagram on page 923 of defendant's printed record, correctly represent that floor, after the changes were made?

Ans. With the exception of this partition marked F. That partition was not there, entire.

Cross-Q. 235. What part of it was there?

Ans. A portion of the western part, from the wall of the house in, probably three feet.

Cross-Q. 236. Was the partition, *H*, there at the time of that first conversation?

Ans. I think so.

Cross-Q. 237. How long did the company occupy the shop, before that partition, *H*, was put up?

Ans. I cannot say.

Cross-Q. 238. What makes you think that this instrument, "E," is the one that Mr. Drawbaugh showed you at Mechanicsburg, at your store?

Ans. From this covering on the bottom, here, and the adjuster, (I suppose you would call it,) on the bottom of it.

Cross-Q. 239. Before he showed you the instrument, "E," at your store at Mechanicsburg, you had seen this instrument, "D," at the shop, had you not?

Ans. That is my impression; yes, sir.

Cross-Q. 240. When he showed you the instrument at your store at Mechanicsburg, did you recognize it as being different from the instrument which you had before seen at the shop, or did you think it was the same instrument that you had before seen at the shop?

Ans. It was the same instrument, with the exception of this bottom covering—seemed to be the same.

Cross-Q. 241. In your examination-in-chief, you say that, during the latter part of the time that the operations of the clock company were going on at Drawbaugh's shop, there was a pair of telephones connected there, or at least he said so. Did you see those instruments?

Ans. I saw the one.

Cross-Q. 242. Where was it?

Ans. In the lower story, or ground floor.

Cross-Q. 243. Do you mean down in the basement or cellar, where the water-wheel was?

Ans. Yes, sir.

Cross-Q. 244. Where was the other instrument?

Ans. I don't know.

Cross-Q. 245. Did he tell you where it was, at the time?

Ans. I think he did; but I do not recollect where it was.

Cross-Q. 246. Didn't you see it?

Ans. No, sir.

Cross-Q. 247. How many times did you see the instrument down in the basement or cellar?

Ans. Once.

Cross-Q. 248. Was it connected to the wire when you saw it?

Ans. I don't know; I didn't examine it.

Cross-Q. 249. Do you know how long it remained there in the basement?

Ans. No, sir.

Cross-Q. 250. How happened you to go down into the basement and see it?

Ans. I think my brother spoke to me of it.

Cross-Q. 251. Did you have any of your clock machinery or materials in the basement?

Ans. No, sir.

Cross-Q. 252. You didn't go down into the basement, I suppose, very often; did you?

Ans. Not often.

Cross-Q. 253. If your brother hadn't spoken to you about that pair of instruments being connected to the line, you wouldn't have known anything about it, would you?

Ans. If I wouldn't have been told of it, I would not have known it.

Cross-Q. 254. Do you recognize among these instruments here in the room, the particular instrument which you saw down in the basement or cellar at that time?

Ans. No, sir.

Cross-Q. 255. Was it a large or small instrument?

Ans. I cannot say. I merely glanced at it and saw that there was one there.

Cross-Q. 256. At that first conversation that you had with Mr. Drawbaugh there in the shop about telephones, you say he spoke to you also about phonographs, and said he had experimented and made a phonographic instrument. Did he describe that instrument that he had made?

Ans. Yes, sir.

Cross-Q. 257. Do you remember his description of it?

Ans. No, sir; I do not—not distinctly. He made no diagram or sketch of it.

Cross-Q. 258. State all that you remember that he said about it?

Ans. I can only remember of him saying that it had a wooden cylinder that revolved, and a horizontal lever with a pin attached to the end, extending over this cylinder, and by speaking in the machine, it would cause this lever to vibrate and the pin would make indentations on the wooden cylinder corresponding to the speech. That is as near as I can remember, as I understood it.

Cross Q. 259. Did he tell you how he happened to get up that instrument, or what he intended it to be used for?

Ans. No, sir.

Cross-Q. 260. Did he not tell you that it was devised and intended to be employed as an attachment to clocks?

Ans. No, sir.

Cross-Q. 261. Did he not tell you that the phonograph instrument which he had made was designed to re-produce only musical sounds?

Ans. No, sir.

Cross-Q. 262. Did he not tell you that it had been intended to make a clock sing a tune, instead of striking certain hours?

Ans. No, sir.

Cross-Q. 263. Did he say when he had experimented with phonographs? How long ago?

Ans. No, sir.

Cross-Q. 264. Did he give you to understand that it was at the time of his early experiments with telephones, or afterwards?

Ans. He didn't say.

Cross Q. 265. You say in your fifth answer, that you paid him forty dollars for a fly-net machine, which he made for you in 1869. When did you pay him that forty dollars?

Ans. I can't give the time. It was a very short time after he made the machine.

Cross-Q. 266. Did you pay it to him all at once, or in installments?

Ans. It is my impression now, that I paid it to him at once.

Cross-Q. 267. Did you take any receipt from him for it?

Ans. I do not know. I think not.

Cross-Q. 268. Did you meet Mr. Drawbaugh, once in 1879, at a Grangers' meeting in Cumberland county.

Ans. Yes, sir.

Cross-Q. 269. Was that after the clock company suspended active operations, or not?

Ans. I think it was.

Cross-Q. 270. Did you have a quarrel with him at that meeting?

Ans. No, sir.

Cross-Q. 271. Was it a very amicable and friendly meeting between you two?

Ans. It was; so far as I was concerned.

Cross-Q 272. Who was present besides yourself and Mr. Drawbaugh at your meeting with him on that occasion?

Ans. I couldn't say.

Cross-Q. 273. Where was that meeting?

Ans. I think it was where I had my implements on exhibition.

Cross-Q. 274. Where was that?

Ans. At the Grangers' pic-nic referred to.

Cross-Q. 275. Where was the Grangers' pic-nic.

Ans. On Yellow Breeches creek, on the line of the Mechanicsburg and Dillsburg railroad, about four miles south-west of Mechanicsburg.

Cross-Q. 276. It was at a place called Williams' Grove; was it not?

Ans. Yes, sir.

Cross-Q. 277. Did not hot and angry words pass between you and Mr. Drawbaugh on that occasion?

Ans. No, sir.

Cross-Q. 278. Nor on any other occasion?

Ans. No, sir; not to my recollection.

Cross-Q. 279. Mr. E. W. Chellis once called upon you, to see what you knew about Drawbaugh's telephones; did he not?

Ans. I don't recollect that he did. He may have spoken to me about them, but I don't remember of having any particular conversateon with him with regard to them.

Cross Q. 280. Don't you recollect a conversation with Mr. E. W. Chellis, in the early part of the fall of 1880, and of telling him, in that conversation, that you knew nothing at all about Drawbaugh's telephone?

Ans. I don't recollect it..

Cross Q. 281. You made an affidavit for the complainants in this suit, in the fall of 1880, did you not?

Ans. I think it was in the fall of 1880.

Cross-Q. 282. Who went to you on behalf of the complainants, to procure that affidavit, or to ascertain what you knew about the case?

Ans. I think it was Mr. Storrow who procured the affidavit.

Cross-Q. 283. Were you visited by Mr. Weeks, or Mr. Theophilus Weaver, on that business?

Ans. There was a gentleman called on me. I think his name was Weeks.

Re-direct examination by Mr. Storrow:

Q. Q. 284. You said that your brother and Mr. Shettle were near you during some parts of this conversation in the shop, which you have described. Was that during the telephone part of the conversation, or the other part of the conversation?

Ans. They were present while he was talking of the phonograph.

Re-cross-examination by Mr. Hill.

Re-cross-Q. 285. Which was talked about first; the telephone or phonograph?

Ans. The telephone.

Re-cross-Q. 286. Were they not present during any part of the conversation on telephones?

Ans. I think not.

Re-cross-Q. 287. You are not certain about it, are you?

Ans. They took no part in the conversation.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 29th day of July, 1882.
FRED. M. OTT, *Examiner.*

THEO. GRISSINGER.

Adjourned to meet at Baltimore, Md., on Tuesday, August 1, 1882, at 10, A. M.

Eutaw House, Baltimore, Md., August 1, 1882.

Examination resumed, pursuant to adjournment.

Present, Mr. Storrow, for complainants, and Mr. Hill for respondents.

James P. Matthews, being produced, sworn, and examined, saith:

Examined by Mr. Storrow:

My age is forty-four years; residence, 303 Hollins street, Baltimore, Md.; I am employed on the Baltimore *Sun*.

Q. 1. Were you one of the editors of one of the Baltimore papers in 1878; if so, which one?

Ans. I was the managing editor of the Baltimore *American*.

Q. 2. Please look at the article I now show you, in the Baltimore *American*, of February 2, 1878, entitled: "A Letter from New Cumberland," and printed in complainants' record, page —; and tell me whether you read it at the time it appeared?

Ans. I saw the manuscript of that article before it appeared. I made it up as copy. I read it before it was printed. I remember of reading it, very distinctly, in the manuscript. Whether I read it next morning in the paper, or not, I can't say. Very likely I did.

Q. 3. Did you afterwards visit the shop of Mr. Daniel Drawbaugh, at Eberly's Mills?

Ans. I did.

Q. 4. Please look at a copy which I now hand you, of an article in the Baltimore *American* of November 28, 1878, printed on pages 99--102, complainants' moving papers, and state whether you wrote it?

Ans. I did.

Q. 5. Please read it to the examiner, that he may take it down as part of your answer.

Ans. It is as follows:

(From the Baltimore American of November 28, 1878.)

A Magnetic Motor.

The Boston correspondent of the New York "Times" gives an account of a new motor now being constructed by Mr. W. W. Gary, of that city, which seems to be almost identical in its action with the perpetual clock, invented by Mr. Daniel Drawbaugh, of Cumberland county, Pa.; two magnets, one upright and one horizontal, are so adjusted that the alternate attraction and repulsion, which occur as a piece of soft iron vibrates between them, keep a wheel in revolution. We quote from Mr. Gary's explanation of the movements of the machine, as given by the correspondent:

"Now you see that when the poles of the upright revolving magnet are opposite the corresponding poles of the horizontal one, they are repelled—like repelling like—so the upright magnet is turned around until positive and negative meet. Here it would stay, and all motion would cease where it not for the delicate balancing of that piece of soft iron, which is alternately attracted and repelled according to the conjunction of the magnets, changing its polarity in such a way and at just such a moment as to swing the poles of the upright, revolving magnet beyond the dead center; thus the motion is made continuous. It is quite like giving just enough additional impetus at each stroke of a pendulum to keep it continually in motion."

If Mr. Gary has been correctly reported, he describes the very principle on which Mr. Drawbaugh's clock is constructed. The pendulum receives an impulse at each stroke which keeps up a continuous motion, and this impulse is derived from the alternate attraction and repulsion of two magnets, and the existence of "a neutral line," at which the one pole loses its power and the other begins to act. One of the editors of the "American" visited Mr. Drawbaugh last April, and looked at his clock, but not being an "expert" in electro-magnetism, he did not care to attempt to demonstrate the principle on which it moves and keeps time accurately from year to year. Mr. Drawbaugh is not a scientific man himself, and it may be doubted whether he could explain the action of his clock in a way that would be entirely intelligible even to a trained electrician. He is a plain mechanic, who has had a hard struggle to support his family, by making common agricultural implements, while he was meditating on the nice adjustment of forces and the delicate mechanism which keep his clock in motion. If the principle is the same as that on which the Boston motor is constructed, Mr. Drawbaugh can claim at least four years' priority in the discovery.

Unlike other clocks, the pendulum is the motor in this perpetual timekeeper. It is suspended on a sharp-edged pivot of hardened steel, so as to reduce friction to a minimum. The ball probably weighs twenty pounds. The middle rod terminates midway between the ball and the point of suspension in an ordinary permanent magnet; fastened against the back part of the case, or against the wall, at right angles to the permanent magnet, is an electro-magnet. The wires attached to the poles of this magnet are not in sight, but they run down into the ground, each terminating in a copper plate, about two feet below the surface. Thus the earth becomes the battery that feeds the electro-magnet. When the pendulum is swung away from the perpendicular line, the opposite poles of the two magnets first attract and then repel, and in this way the oscillation is kept up; we shall leave it to the scientists to elucidate the theory and explain the electrical action by which this is effected. We are only speaking of the result, namely, the continuous vibration of the pendulum. At the top of the pendulum is a little ratchet, which moves the wheel to which the second hand is attached, and from this the motion is communicated to the minute hand, and from the minute hand to the hour hand. There being no necessity for the multiplication of motion at the expense of power, the complicated series of cog wheels, by which this is effected in clocks moved by weights or spring coils is done away with. The three cog wheels, with the index hands attached to their axles, constitute the entire "works" of the clock. There is nothing to get out of order; and, there being only four bearings that are subjected to the least friction, the clock would probably run two hundred years or more before any part would have to be renewed. This comes nearer to perpetual motion than anything that has been discovered.

It is a singular fact that this ingenious piece of mechanism, which embodies in its action the latest discoveries of science, is the work of a plain, hard-working man, who has always lived in the country, and who has never had an opportunity of seeing any practical experiments in electro-magnetism.

No doubt when he began to make a clock that would require neither weight, nor spring, nor galvanic battery to move it, he was pursuing the *ignis fatuus* of self-taught inventors,—perpetual motion. He has patented several useful agricultural and mechanical machines, but has never had means to make them a commercial success. No one that visits his shop would suppose it possible that a beautiful clock could be made in such a place. Nevertheless, where there is mechanical genius fine work can be done with the simplest tools. Mr. Drawbaugh lives about two miles from New Cumberland, on the Northern Central Railway. If any Baltimorean doubts the truth of what we have written about the perpetual clock, a visit to his shop, and look at this scientific and mechanical wonder that has been ticking away for four or five years without a second's intermission, will cure him of his scepticism.

It may be mentioned that Mr. Drawbaugh constructed a rude telephone

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long before Edison loomed up as the "boss" inventor. He never expected to send articulate sounds over a magnetized wire, but he believed that an alphabet could be arranged after the manner of the musical scale, and that messages could be transmitted and understood by the variations of tone and pitch. This unlettered country mechanic came very near anticipating Edison and Bell in the invention of the telephone. Nothing but his poverty prevented him from conducting his experiments to a successful issue.

Q. 6. This article states: "One of the editors of the *American* visited Mr. Drawbaugh last April," which would be April, 1878. Are you the editor there referred to?

Ans. I am.

Q. 7. Was your visit in the first part, or last part of April, 1878?

Ans. It was in the last part, or it may have been the first of May.

Q. 8. Your article of November 28, 1878, begins by referring to, and quoting from the New York *Times*, a passage from a then recent publication about the Gary motor. It then purports to give an account of what you learned from Mr. Drawbaugh, at the visit to his shop on the day referred to. Does or does not the part which refers to Mr. Drawbaugh and his work, correctly state the recollection you had, at the time of the writing of the substance of what Mr. Drawbaugh told you at that interview?

Ans. It does.

Q. 9. The last paragraph of your article refers to something that Mr. Drawbaugh did, or attempted to do, about the telephone. Does that paragraph correctly state the recollection you had, at the time of writing, of the substance of what Mr. Drawbaugh told you at that interview?

Ans. It does.

Q. 10. I again call your attention to those parts of the article which relate to Mr. Drawbaugh, and ask you whether they agree with your present recollection of the substance of what Mr. Drawbaugh told you at that interview?

Ans. They do.

Q. 11. At the time you went to Mr. Drawbaugh's shop, and at the time you wrote that article, did you intend and desire to depreciate Mr. Drawbaugh and his work or did you intend and desire to speak as favorably of him and it as what you learned there might warrant, in your judgment?

Ans. I went there to see his clock, and I intended to write it up as favorably as the facts would warrant.

Q. 12. While you were at his shop, at that visit, was any talking carried on through a telephone?

Ans. No.

Q. 13. Did you, at his shop, see any telephones completed and in working order?

Ans. I did not.

Q. 14. While you were there, did you see any telephone completed and put together, or did you see any detached parts, which he told you belonged to a telephone?

Ans. I saw no telephone, or nothing looking like a telephone, as I understood it. Mr. Drawbaugh showed me two small hemispheres, to each of which there was a wire attached, and told me that he had been experimenting with the telephone. He showed me no other apparatus, except these pieces.

Q. 15. Please look at the large tall instrument "H," now shown you, and tell me whether you saw it at that interview?

Ans. I saw no instrument like that.

Q. 16. Have you ever been at Mr. Drawbaugh's shop, except at that visit?

Ans. I have not.

[Recess for dinner, until 3, P. M.]

AUGUST 1, 1882, 3, P. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Cross-examination of James P. Matthews, by Mr. Hill.

Cross-Q. 17. How long was your visit at Mr. Drawbaugh's shop?

Ans. It was an hour, or possibly two hours, to the best of my recollection.

Cross-Q. 18. I suppose you had no motive in going there, except to see the electric clock; had you?

Ans. My object was to get material for a striking newspaper article, and I only had the clock in my mind.

Cross-Q. 19. Did you take any notes while you were there?

Ans. I must have taken notes, although I cannot remember, now, the form in which they were taken.

Cross-Q. 20. Do you recollect the fact of taking notes, or do you infer that you took notes, from your usual habit, or from the character of the article which you published?

Ans. I recollect that I did take notes, but I am often in the habit of taking down rough sketches, which re-call to my mind the subject-matter that I wish to reproduce.

Cross-Q. 21. Then, if I understand you, you are not able to say whether you merely took down the heads with which to excite your mind to recollection afterwards, or whether you took down full notes, from which you had merely to prepare the article?

Ans. I am sure that I did not take down full notes.

Cross-Q. 22. The article seems to have been published November 28, 1878, and the visit, which it described, I understand to have occurred about the latter part of April or early part of May, 1878, was the article written about the time of its publication or immediately after your return from the visit?

Ans. The article was written, as far as I remember, on the evening before it was published.

Cross-Q. 23. Have you ever studied mechanics or practiced any mechanical occupation?

Ans. No, sir; not particularly.

Cross-Q. 24. Have you ever been engaged in any other business except that of newspaper editing and reporting?

Ans. I have been a school teacher and I practiced law four years.

Cross-Q. 25. With your limited mechanical knowledge, do you feel confident that you got a correct understanding or gave a correct description of Mr. Drawbaugh's clock?

Ans. I was not at all satisfied with the description I obtained of Mr. Drawbaugh's clock, nor with his explanation of the principle on which it was constructed, and for that reason I did not write the article on my return home.

Cross-Q. 26. I suppose you were really stimulated to write the article, in November, 1878, by reading the article in the New York Times, relating to the Gary motor, to which you refer in your article, were you not?

Ans. I was; it was that article that re-called my visit to Mr. Drawbaugh's shop. I supposed that the principle of the Gary motor was the same that Mr. Drawbaugh had tried to explain to me, and I meant to set up a claim of priority of invention for him.

Cross-Q. 27. I observe in your article this statement: "Mr. Drawbaugh is not a scientific man himself, and it may be doubted whether he could explain the action of his clock in a way that would be entirely intelligible even to a trained electrician." I judge from that paragraph that in your interview with Mr. Drawbaugh you found him to possess very little facility in communicating his mechanical ideas. Am I right?

Ans. I had much difficulty in understanding him.

Cross-Q. 28. Was your interview at his shop mostly taken up with the examination and discussion of the clock?

Ans. Yes, sir; we devoted more time to the clock than anything else.

Cross-Q. 29. Was anybody present with you and Mr. Drawbaugh during that interview?

Ans. The shop, as I remember, had two or three apartments; and there was a man working at a clock case in one of the apartments—in a large room. The boy who drove me over from New Cumberland may have been there part of the time.

Cross-Q. 30. I suppose you made no very particular examination of any other machinery except the clock; did you?

Ans. We examined the clock more particularly than anything else.

Cross-Q. 31. I suppose you couldn't undertake, after this lapse of time, to re-call or enumerate all the instruments or machines that were standing around in the shop where you were; could you?

Ans. I could not; there may have been things there that escaped my notice.

Cross Q. 32. Referring, for example, to this machine before you, marked "H," I suppose the most you can say of that machine is, that you do not recollect having seen it there, and that you could not swear, as a matter of fact, that you did not see it there; could you?

Ans. I cannot say that it was not there. I did not see it, although I asked Mr. Drawbaugh to show me his telephone.

Cross-Q. 33. Did he, in response to that request, show you any telephones; if so, how many?

Ans. When that request was made, my recollection is that we were not in the main shop; we were in another room. Mr. Drawbaugh picked up two hollow wooden hemispheres—my recollection is—and said that he had been experimenting with them. I have no distinct recollection of their mechanical construction, except that there were pieces of loose wires attached. When I say loose wire, I mean that the other end was not attached to anything. It was hanging free. He showed me no other apparatus than that—of telephones.

Cross-Q. 34. Did you understand from him that he had been recently experimenting with those, or that they were the subjects of former experiments, or did he give any idea as to when the experiments were made?

Ans. I cannot recollect that he told me when he had been experimenting; but these pieces were not in use at that time.

Cross-Q. 35. Did they look as if they were recently made, or did they have an antique appearance?

Ans. Very ancient and rude.

Cross-Q. 36. How large were they, and were they both alike in dimensions and shape?

Ans. My recollection is that they were alike, and that they were about three inches and a half in diameter—possibly four.

Cross-Q. 37. Are you pretty clear in your recollection that they were hemispherical in shape?

Ans. That is my recollection at present, although I made no drawing of them, and paid very little attention to them. And Mr. Drawbaugh himself gave me the impression that he had thrown them entirely aside.

Cross Q. 38. Do you mean that he had thrown those two hemispherical instruments entirely aside?

Ans. Yes, sir.

Cross-Q. 39. In the last part of your article I see the following statements, referring to Drawbaugh and his telephone: "He never expected to send articulate sound over a magnetized wire, but he believed that an alphabet could be arranged after the manner of the musical scale, and that messages could be transmitted and understood by the variations of tone and pitch." Are you confident that you have correctly referred that statement to the telephone, and that you have not mixed up statements which he made concerning an old dial or alphabetical telegraph of his with statements which he made concerning his telephone, and possibly with statements concerning the possibility of transmitting musical tones?

Ans. I saw no dial telegraph in his shop, and I do not think the subject was mentioned. The statement which I have made in that article is a reproduction of the impression that his conversation made upon me at that time. We had a good deal of talk about the telephone, and he explained to me the different theories upon which he had worked. The passage quoted is the summing up of what he said, or at least of what I understood him to say.

Cross-Q. 40. You found that he talked very rapidly, and in broken and disjointed sentences, running from one subject to another; did you not?

Ans. I cannot remember that I noticed that peculiarity so much as a want of facility of expression. He had difficulty in selecting language to convey his ideas, which I attributed to his imperfect education.

Cross Q. 41. Suppose you were informed that, out of over a hundred witnesses examined in this case, a very large number had testified in substance that prior to your interview with Mr. Drawbaugh, and even prior to the year 1876, they had actually witnessed the sending of articulate sounds over a magnetized wire at Mr. Drawbaugh's shop—had sent such sounds and had heard them when sent by others—and that among all the witnesses who had ever been at the shop not one had testified of an alphabet being arranged after the manner of the musical scale, or of messages being transmitted and understood by variations of tone and pitch; in view of such information, would you feel confident that you had correctly understood or remembered Mr. Drawbaugh in the matter referred to in the quotation which I last made from your article?

[*Question objected to by Mr. Storrow, because it asks the opinion of the witness on matters alleged, but not within his knowledge, and because it does not state the many facts and circumstances which throw discredit upon the testimony referred to.*]

[*Mr. Hill objects to the last clause of the objection going upon the record, because unwarranted by any facts in the case.*]

Ans. Mr. Drawbaugh never told me that he had an instrument that would transmit messages in the way mentioned, but that was the theory upon which he had worked. I have no information whatever on the subject, except that derived from my conversation with Mr. Drawbaugh. He did not tell me that he ever had sent articulate sounds over a magnetized wire, or that he had an instrument by which that could be accomplished. As to weighing my recollection against the testimony, that is a judicial question which I cannot answer. When I wrote the article I was trying to state the case as strongly in favor of Mr. Drawbaugh as my recollection of his conversation would permit.

Cross-Q. 42. Then I will ask you this question: Are you entirely confident, that in the matter referred to in that quotation, you really understood Mr. Drawbaugh as he meant to be understood?

Ans. There were two things that we talked about that day, the clock and the telephone. The clock received by far the most attention. I cannot remember that any other instrument was mentioned in connection with the telephone. We talked about the claim of priority of invention, and mentioned both Bell and Edison. Mr. Drawbaugh told me that the idea of the telephone was not first suggested by either of them. He did not set up any claim as being the discoverer himself; he said he had first read about it in a translation of some foreign publication.

Cross-Q. 43. That does not quite answer my question, which was: Are you confident that you understood Mr. Drawbaugh correctly in the matter referred to in the paragraph quoted, or may you not have mistaken his meaning?

Ans. I gathered from the previous question, that Mr. Hill suggested, whether we may not have talked of other instruments in connection with the telephone, and that I may have applied portions of the conversation to the telephone, which, in fact, related to another instrument. In response to that part of the question, I said that I did not remember that we talked of any other instrument in connection with the telephone. I cannot pass any opinion as to the accuracy of my recollection.

Cross-Q. 44. You did talk, in that conversation, about a foreign publication; and you did, in that conversation, get an idea of the use of the musical scale, and of transmitting messages by variations of the tone and pitch. Did you not?

Ans. Mr. Drawbaugh didn't say anything about a musical scale. That is my illustration of the theory which he was trying to explain to me. There was some remark made about a foreign publication. It was merely incidental. I knew nothing about it, myself.

Cross-Q. 45. Was there any talk about Gray's harmonic telegraph?

Ans. There was not.

Cross-Q. 46. Was there talk about messages being transmitted by varying the tone or pitch?

Ans. There was.

Cross-Q. 47. Was there talk about the transmission of music?

Ans. There was not.

Cross-Q. 48. Was there talk about an alphabet being arranged like a musical scale, so that variations of pitch would indicate different letters?

Ans. Mr. Drawbaugh did not go into any details. We merely talked about the theory. I cannot remember that anything was said about an alphabet.

Cross-Q. 49. Did he say anything about having experimented in the direction of the telephone prior to Edison and Bell?

Ans. He did. He talked of having entertained this theory for a long time, and of having experimented years before.

Cross-Q. 50. Did he say that he never intended to send articulate sounds over a magnetized wire?

Ans. He did not use that language at all. The sending of articulate sound was not in his theory, as I understood it. That is, in the theory he was explaining to me. He may have had other theories.

Cross-Q. 51. This theory that he was explaining to you was the one which he said was first enunciated in the foreign publication, was it not?

Ans. No; what he said about the foreign publication was, that it was the idea of the telephone.

Cross-Q. 52. Would you remember the name of the foreign scientist, if you heard it?

Ans. No, sir; he didn't mention any name. I think he said it was a translation from the French. I am sure he said so.

Cross-Q. 53. When Drawbaugh showed you the two pieces, which you think were of hemispherical shape, where did he get them; were they lying on a bench near him?

Ans. They were lying either on a bench or a shelf. He reached some place and took them down, apparently merely because I asked him. He didn't volunteer to show them.

Cross-Q. 54. Did he reach them from where he was standing when you asked the question?

Ans. I have no accurate recollection about that. When we went up stairs we went into a room at the right hand, and I think it was in there that I asked him to show me his telephone, and he showed me these pieces. It was not in that large work-shop, although I think that most of our conversation took place in that large work-shop. My recollection is, that on going up stairs, on turning to the left, we went into the large shop, and on turning to the right, we went into the little room. I do not know which room we entered first. We were in the small room a very short time, and these pieces of apparatus were not under our notice for more than half a minute, perhaps.

Cross-Q. 55. If he didn't reach those pieces from where he was standing, he, at any rate, didn't have to move more than a step or two to reach them, I suppose?

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Ans. I cannot be positive; but they were close at hand. It required no time or effort to get them.

Cross-Q. 56. That was your first aquaintance with Mr. Drawbaugh, was it not?

Ans. I never saw him before nor since.

Cross-Q. 57. Did you take any letter of introduction, or any friend to introduce you, or did you introduce yourself?

Ans. I introduced myself. When I went to New Cumberland, I went to Mr. Mosser's house, to get him to go with me, but he was not at home

Re-direct by Mr. Storrow:

Q. Q. 58. Did you ever meet Mr. Drawbaugh, or have any communication with him, after that?

Ans. I did not.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 1st day of August, A. D. 1882.
FRED. M. OTT, *Examiner.*

JAMES P. MATTHEWS.

Adjourned until August 2, 1882, at 10, A. M.

AUGUST 2, 1882.

Postponed until August 3, at 10, A. M.

AUGUST 3, 1882, 10, A. M.

Examination resumed pursuant to adjournment.

Present: Mr. Storrow for complainants, and Mr. Hill and Mr. Jacobs for respondents.

GEORGE W. KISSINGER being produced, sworn, and examined, saith:

Examined by Mr. Storrow:

My age is fifty-seven, I think; residence, Talbot county, at a place called Chapel, near Easton, Md.; my occupation is farming.

Q. 1. Did you ever live at Eberly's Mill, Cumberland county, Pa.; and if so, when did you live there?

Ans. I moved there in 1871.

Q. 2. Mr. Thomas Draper, a witness for the defendants, testified, page 1165 of defendants' printed record, that about the 1st of April, 1874, you hired of him a farm at Marysville, a few miles north of Milltown, and moved on to it. Does that agree with your recollection?

Ans. Yes, sir.

Q. 3. Did you live at Milltown up to the time when you moved on to Draper's farm, about the 1st of April, 1874?

Ans. Yes, sir.

Q. 4. The lease of Draper's farm to you, which was put in evidence by the defendants, states that it is "for one year from the date of this agreement, and to continue so long as said parties can agree." How long did you occupy that farm before you moved to where you are now?

Ans. Six years.

Q. 5. Mr. Draper testifies that while you lived at his farm, at Marysville, one of Mr. Drawbaugh's rams was put in to throw water up to the house. Is that according to your recollection?

Ans. Yes, sir.

Q. 6. Mr. Draper testifies that you and he went to Mr. Drawbaugh's shop to arrange for the purchase of the ram, but that it was put in the next season after that, because it took some time for you to bore the logs for it. Is that according to your recollection?

Ans. Yes, sir.

Q. 7. Do you remember going to Mr. Drawbaugh's shop with Mr. Draper to arrange for the purchase of that ram?

Ans. Yes, sir.

Q. 8. Did you ever go there more than once with Mr. Draper?

Ans. No, sir.

Q. 9. How did you go over with Mr. Draper and where did you go from?

Ans. We went in a spring wagon. I took him over. We went from his farm, where I was living.

Q. 10. Was it in hot weather or in cool weather?

Ans. Cool weather.

Q. 11. What part of the year was it according to your recollection?

Ans. In the fall.

Q. 12. What was the arrangement between you and Mr. Draper as to who should pay for the ram and what iron piping had to be bought for it?

[*Objected to by Mr. Hill, as immaterial and irrelevant.*]

Ans. The arrangement was I was to get the material and take it out of the rent.

Q. 13. Did you do that?

[*Same objection.*]

Ans. Yes, sir.

Q. 14. Mr. Draper says that some of the piping was to be of logs which you were to get out and bore. Did you get out some logs and bore them for part of the piping?

Ans. Yes, sir.

Q. 15. Did your son, John, help you about boring some of the logs?

Ans. I can't tell you whether it was my son John, or son Cyrus, or Frank; but the boys, I suppose, all helped me.

Q. 16. Did you buy the logs or did you cut them and get them out yourself?

Ans. We got them off the farm.

Q. 17. How soon after you went to Drawbaugh's shop with Draper did you go to work cutting and getting out the logs?

Ans. Early in the spring.

Q. 18. What part of the piping did you make of logs?

Ans. The next to the spring.

Q. 19. Was the ram put right at the spring or some distance off from the spring?

Ans. A good distance from the spring.

Q. 20. Did you use wooden piping or iron piping for the small pipe between the ram and the house?

Ans. Small iron pipe.

Q. 21. How did that small iron pipe get to Marysville?

Ans. It got there through Drawbaugh sending it there.

Q. 22. I ask you to look at the Pennsylvania Railroad Freight Receipt Book, at Marysville Station, receipt four hundred and eighty-five, for two bundles of pipe, one hundred and sixty-five pounds, and at the order from Mr. Daniel Drawbaugh, annexed thereto, and your order annexed thereto, all dated in 1878, and tell me whether that is the pipe which Mr. Drawbaugh sent you, to run from the ram up towards the house?

Ans. Yes, sir.

Q. 23. I see the pipe seems to have been finally receipted for by J. C. Zimmerman. Who was he, and where did he live?

Ans. He lived with me. He was a son-in-law of mine.

Q. 24. Did anybody at Marysville, except you, have one of Mr. Drawbaugh's rams, while you lived there?

Ans. No, sir.

[Mr. Storrow puts in evidence a bill of pipe, from Morris, Tasker & Co., dated July 1, 1878, for two bundles half-inch pipe, one hundred and sixty-five pounds; marked "Marysville," produced by Mr. Drawbaugh, on page 1068, defendants' printed record, as pipe purchased to go with one of his rams; the railroad receipt, headed "Marysville, July 2, 1878, two bundles of pipe, one hundred and sixty-five pounds," consigned to "D. Drawbaugh;" an order annexed thereto, signed by D. Drawbaugh, to deliver it to G. Kissinger, dated September 6, 1878; and, on the back thereof, an order signed by George Kissinger, to deliver the same to Zimmerman; all of which papers are copied into the record, as follows:

"PHILADELPHIA, 7, 1, 1878.

Mr. DANIEL DRAWBAUGH, Eberly's Mills, Cumb. Co., Pa.

Bought of Morris, Tasker & Co., Limited.

Mkd Marysville, Pa.

2 bdles ½″ pipe,	200	.07	14.00	
165 lbs. 55 per cent. and 2 per cent,			7.82	6.18

P. R. R.

. . . .

No. 485.

MARYSVILLE STATION, July 2, 1878.

Mr. D. DRAWBAUGH,

To Pennsylvania R. R. Co., Dr.

For freight from Philad'a, per manifest No. 22,694.

	Marks.	Weights.	Rate.	Amount.
On 2 bdls pipe,		165	21	35

Received the above articles from Pa. R. R. Co.,

J. C. ZIMMERMAN.

. . . .

EBERLY'S MILLS, PA., September 26, 1878.

Mr. GUIDE, Agent, P. R. R. Co., Marysville:

Please let George Kissinger have the pipe at your warehouse, as the pipe is for his use.

DANIEL DRAWBAUGH.

Mr. Gibe, let Zimmerman have them pipe.

GEO. KISSINGER."

Q. 25. Did you, after getting that pipe, procure the ram from Mr. Drawbaugh's shop?

[*Objected to by Mr. Hill as leading.*]

(Question withdrawn.)

Q. 26. Did you get the ram from Mr. Drawbaugh's shop before or after that pipe came by railroad to Ma ysville?

Ans. After the pipe came.

Q. 27. How did you get the ram over from Mr. Drawbaugh's shop to your place?

Ans. I brought it over in a spring wagon.

Q. 28. Did you get any other iron pipe for the ram, before it was put in, except this half-inch pipe that came by the railroad, as already stated?

Ans. Yes, sir; I got several pieces more.

Q. 29. Where did you get that extra pipe?

Ans. Some in Harrisburg; and brought some along when I brought the ram from Mr. Drawbaugh's.

Q. 30. Did, or did not, Mr. Drawbaugh come over and help you put in the ram?

Ans. Yes, sir; he put the ram in.

Q. 31. How did he get over?

Ans. I brought him, part of the way.

Q. 32. Mr. Drawbaugh testifies (defendants' printed record, page 1055) that he put in a ram for you. Did he ever put in any ram for you, except the one you have been testifying about?

Ans. No, sir.

Q. 33. When you took Mr. Draper over to Mr. Drawbaugh's shop to arrange about the ram, as you have testified, did you stay with Mr Draper and Mr. Drawbaugh all time you were there, or were they left by themselves any part of the time?

Ans. They were talking by themselves, and I was walking about the shop viewing other things.

Q. 34. On your way home with Mr. Draper, that day, did he say anything to you about Mr. Drawbaugh having asked him to put any money into anything, or to buy anything from him?

[*Objected to by Mr. Hill, as irrelevant, immaterial, calling for hearsay, and incompetent.*]

Ans. I believe he said something, on the way home, about buying something, and about buying a clock.

Q. 35. Did he, or did he not, say that Mr. Drawbaugh had said anything to him about furnishing any money in connection with the telephone?

[*Same objection.*]

Ans. He said something about furnishing money, but I can't be positive whether it was about telephone, or not, any more. I rather think it was something about the telephone.

Q. 36. Did you, or did you not, see a large clock at Mr. Drawbaugh's, on that visit?

Ans. Yes, sir.

Q. 37. Do you remember whether it was a clock to go by weights, or whether it was a clock that was to go by electricity?

Ans. To go by electricity. I saw no weights.

Q. 38. While you lived at Eberly's Mills, from April, 1871, to April, 1874, what was your occupation?

Ans. I kept a little store there, and worked out occasionally.

Q. 39. Was there any other store in the place?

Ans. No, sir.

Q. 40. What has become of the building where you kept the store?

Ans. I believe it blowed up.

Q. 41. Did you work out any in Harrisburg, while you lived at Eberly's Mills; and if so, how much, and at what?

Ans. Yes, sir; I worked about eighteen months there, in the car shops, at Harrisburg.

Q. 42. Are you a mechanic by trade?

Ans. I am a carpenter by trade.

Q. 43. While you worked at the Harrisburg car shops, did you live at Harrisburg, or live at home, at Eberly's Mills?

Ans. I lived at home, at Eberly's Mills.

Q. 44. Did you go back and forward every day?

Ans. Yes, sir; except part of the time that I boarded.

Q. 45. During how much of the time did you board at Harrisburg?

Ans. I boarded there the first winter, three months.

Q. 46. Was your store much of a place of resort in the evenings?

Ans. It was; some evenings it was full.

Q. 47. Did you ever have any particular attractions there, Saturday evenings?

Ans. Not particularly, only ice cream, and so on, to spend Saturday night with.

Q. 48. Was there any tavern in the village, while you were there?

Ans. No, sir.

Q. 49. After you left there, and moved to Marysville, were you in the habit, for a number of years, of going over to Milltown frequently; and if so, for what purpose?

Ans. Yes, sir; I went to Milltown pretty often, on account of collecting a little money.

Q. 50. On these occasions, when you would go over to collect money, did you often go to Mr. Drawbaugh's shop; and if so, for what purpose?

Ans. I often went there to see him; and we had a little dealings still; and sometimes I would get something there; and sometimes I had a little other business there.

Q. 51. On any of these visits, did Mr. Drawbaugh ever show you a telephone, or ask you to put your ear at one, and listen?

Ans. Yes, sir; I held my ear to something; but I couldn't tell whether it was the same telephone that he showed me, or not; but I listened at something.

Q. 52. Did you understand what was said through the telephone, at that time?

Ans. No, I think not, sir; I don't recollect of understanding anything about it.

Q. 53. Mr. Drawbaugh, in his testimony (defendants' printed record, page 887) produced a note signed by himself and you, dated April 26, 1873, for sixty dollars, payable thirty days after date, in favor of George Leonard. Do you remember about that note?

Ans. Yes, sir.

Q. 54. Mr. Drawbaugh testified that it may have been for a bill he owed you at the store. Was it for the bill, or part of the bill, he then owed you?

Ans. Yes, sir; it was got out of the store?

Q. 55. Did Mr. George Leonard cash that note for you?

Ans. I think, if my memory serves me right, I got nearly all cash for it.

Q. 56. What did you get for the rest of it that you didn't get actual cash for?

Ans. It went on part rent and bills of things that I got from Mr. Leonard.

Q. 57. I see that that note is signed both by you and Mr. Drawbaugh. Was it understood between you which of you two was to pay it?

Ans. Yes, sir; Drawbaugh was to pay it?

Q. 58. Have you ever been asked to pay it?

[*Objected to by Mr. Hill, as immaterial.*]

Ans. No, sir.

Q. 59. Did Mr. Leonard own your store building all the time you were at Eberly's Mills?

[*Objected to by Mr. Hill, as incompetent and calling for secondary evidence.*]

Ans. Yes, sir.

Q. 60. Did you hire it of him all the time you were there?

Ans. Yes, sir.

Q. 61. While you lived at Eberly's Mills, and before you moved away, were you, or were you not, in the habit of going to Mr. Drawbaugh's shop?

Ans. We were in the habit of going there pretty often.

Q. 62. While you lived at Eberly's Mills did he ever show you any talking machines or telephones?

Ans. No, sir; not while we lived there.

Q. 63. While you lived at Eberly's Mills did you ever hear that he had a talking machine or telephone?

Ans. No, sir.

Q. 64. Did Mr. Drawbaugh and one of his counsel come down to your place near Easton, about eighteen months ago, and speak with you about telephones?

Ans. Yes, sir.

Q. 65. What part of the year was it, and what kind of weather was it?

Ans. I think it was in February. It was very cold weather, I know—

cold enough to freeze most anybody. I can't tell what month exactly, but it was in February or the latter part of January. I saw it in the book, but I can't tell you now.

Q. 66. Did they have with them, and show to you, any instruments, and ask you if you could recognize them?

Ans. Yes, sir.

Q. 67. Did you identify the instruments they showed you?

Ans. No; I couldn't exactly identify them.

Q. 68. Did Mr. Drawbaugh and one of his counsel come to your place again, this present year?

Ans. Yes, sir.

Q. 69. When was it?

Ans. I believe it was March, as near as I can tell you.

Q. 70. What time of the day did they come to your house?

Ans. They came in the night, betwixt eight and ten, as near as I can get at it. I was in bed. I didn't look what time it was when they left.

Q. 71. What did they ask you about, at this visit?

Ans. Something about the time the ram was put in, or the time Draper was down.

Q. 72. What did you tell him about the date?

Ans. I told him I would look up something, and, if I could find something to interest him, I would leave him know in the morning.

Q. 73. Did you, at that evening, tell him what your recollection was, at that time, about the date?

Ans. I did, as near as I could.

Q. 74. What date did you give him?

Ans. I gave him the date of 1878; that the ram was put in in 1878.

Q. 75. Did you hunt your papers that night, to see if you could find anything to fix the date, as he requested?

Ans. Yes, sir; I hunted till near twelve o'clock that night.

Q. 76. Did you find any paper to fix the date, that night?

Ans. No, sir.

Q. 77. Where did you meet them next morning?

Ans. I met Mr. Drawbaugh out at Woodland station, between my house and Easton; that was where I had agreed to meet them.

Q. 78. Did either of them get out of the cars, and come and speak to you; and if so, which one?

Ans. None but Drawbaugh I talked to that morning.

*

Q. 79. Did you tell him that you hadn't found any paper that fixed the date?

Ans. Yes, sir.

Q. 80. Did you tell him of any place where he could find a writing that would fix the date?

Ans. Not more than that I told him the only place to find it would be at Marysville.

Q. 81 What place in Marysville?

Ans. The Pennsylvania depot.

Q. 82. What did you tell him he could find there that would fix the date?

Ans. Principally the receipts and the bill; by which he could see when the pipe came.

Q. 83. That morning when you met Mr. Drawbaugh at Woodland Station, did you give him any note or memorandum about finding the date at Marysville?

Ans. I gave him a little note drawn up by pencil, because I thought I would not have much time to talk to him; but he got out of the cars, and the paper wasn't of much use, as I told him.

[Recess for dinner, until 2.15, P. M.]

AUGUST 3, 1882, 2.15, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Examination of George Kissinger, by Mr. Storrow, continued:

Q. 84. Please look at the instruments now shown you, marked "F" and "B" and state whether those are the instruments that Mr. Drawbaugh showed you, when he first came to see you at your place, about eighteen months ago?

Ans. I don't know whether its the same ones; but they look like it; they are pretty near the thing.

Q. 85. Look at the instrument "I", and tell me whether you ever saw it or one like it, to your recollection?

Ans. No, sir.

Q. 86. Look at the instruments "C" and "C reproduced," and tell me whether you ever saw them, or instruments like them, to your recollection?

Ans. No, sir; I saw nothing but things the shape of this (indicating permanent magnet of "C reproduced"); some were small and some were large.

Q. 87. According to your recollection, was it while you lived at Eberly's Mills, or at some of your visits after you moved away to Marysville, that you saw those horse shoe magnets at the shop?

Ans. I saw those before I moved away. I will tell you how I came to know. I had some in my hands, and would pick up pins and such things with them; they would draw it up.

Q. 88. Did Mr. Drawbaugh ever show you any telegraph instruments at his shop?

Ans. Yes, sir.

Q. 89. What did he say about them, or what kind of things were they?

Ans. They were things that you put your fingers on. There were some wires run up on the wall. A very simple thing, too, it seemed, but I didn't understand it. He was showing it to me there.

Q. 90. Did one of those telegraph instruments have a dial with letters around it, and a pointer to point to the letters?

Ans. I can't tell; but it has something to make a mark. What it was I can't say.

[*Mr. Hill objects to the introduction and use of the book purporting to be the Pennsylvania railroad book, and to the extracts taken therefrom, on the ground that the said book has not been properly verified.*]

Cross-examined by Mr. Hill.

Cross-Q. 91. How long ago did Mr. Drawbaugh show you that telegraph instrument?

Ans. It was directly after I moved, or just before I moved, to Marysville. I can't say whether it was before or after.

Cross-Q. 92. I suppose you wouldn't be able to recognize that instrument now, if you saw it again, would you?

Ans. I don't think I would. I might, possibly.

Cross-Q. 93. Did you see the horse-shoe magnets hanging up on the wall before or after Mr. Drawbaugh showed you that telegraph instrument?

Ans. I suppose it was hanging there about the time.

Cross-Q. 94. Did you ever see an electric clock at Drawbaugh's shop before you moved to Marysville?

Ans. No, sir.

Cross-Q. 95. Did you ever see a machine for making nails, there at Drawbaugh's shop?

Ans. Yes, sir.

Cross-Q. 96. Did you see it there before you moved to Marysville?

Ans. Yes, sir.

Cross-Q. 97. How long before did you first see it?

Ans. The first time I moved to Eberly's Mills.

Cross-Q. 98. Did you ever see a fire-alarm apparatus at Drawbaugh's shop?

Ans. No, sir.

Cross-Q. 99. Did you ever see a machine for making tacks at Drawbaugh's shop?

Ans. Not more than the flour-barrel tacks—about three-penny—made on the nail machine.

Cross-Q. 100. You never saw any machine for making tacks except what Drawbaugh called the nail machine, did you?

Ans. That is all.

Cross-Q. 101. Did you ever see a machine for stemming grapes, there at Drawbaugh's shop?

Ans. No, sir.

Cross-Q. 102. Did you ever see a machine or instrument for sewing carpet rags there at Drawbaugh's shop?

Ans. Yes, sir.

Cross-Q. 103. When did you first see that, there?

Ans. The time I was living there.

Cross-Q. 104. The first part or last part of the time you were living there?

Ans. The latter part, I think.

Cross-Q. 105. Did you ever see a galvanometer there at Drawbaugh's shop?

Ans. Yes, sir.

Cross-Q. 106. When was that?

Ans. About the latter part of the time I was there.

Cross-Q. 107. What sort of a looking thing was that? Describe it as well as you can.

Ans. It was pretty much like a thermometer, but we looked at it to tell the weather. It would raise up in heavy weather and then it would fall. It was a weather-teller.

Cross-Q. 108. When did you first see that, there at the shop?

Ans. That was about the last of my time there, about the last year.

Cross-Q. 109. Did you ever see what Drawbaugh called a galvanic or electric battery, there at the shop?

Ans. Yes, sir.

Cross-Q. 110. When did you first see that, there?

Ans. I saw that the first or second year I lived there.

Cross-Q. 111. Did you ever see it more than once?

Ans. I don't recollect.

Cross-Q. 112. You don't recollect of seeing it but once, do you?

Ans. Yes, sir.

Cross-Q. 113. What do you mean by that, that you did see it more than once or that you did not?

Ans. I only saw it once that I can recollect of.

Cross-Q. 114. What sort of looking thing was it?

Ans. I can hardly tell you. It was a thing that you held on to as long as you could, and they had to get the steam off to get you loose.

Cross-Q. 115. Would you recognize it if you saw it again now?

Ans. I wouldn't like to undertake to recognize it now. It has been a good while.

Cross-Q. 116. Did Drawbaugh tell you what he used it for?

Ans. He has told me what it was used for already; but I couldn't tell you now.

Cross-Q. 117. I suppose you didn't take much interest in Drawbaugh's contrivances there at the shop, while you lived there; did you?

Ans. No, sir.

Cross-Q. 118. Even if you heard people talking about them, I suppose you didn't pay much attention to what was said, did you? Didn't charge your memory with it?

Ans. No, sir.

Cross-Q. 119. Do you recollect of ever hearing anybody talk about his galvanometer, or his electric clock, or his telegraph, or his fire-alarm, or his battery, before you moved to Marysville?

Ans. No, sir; I think not. I don't recollect of hearing anyone.

Cross-Q. 120. I suppose you wouldn't swear you didn't hear people talk about his talking-machine before you moved to Marysville, but only that you don't recollect hearing anybody talk about it. Am I right?

[*Question objected to by Mr. Storrow, as purely illucid and metaphysical.*]

Ans. Yes; I couldn't swear.

Cross-Q. 121. When you lived in Marysville, did you always live in one house?

Ans. Yes, sir; I lived six years in one house.

Cross-Q. 122. Who lived in that house before you moved into it?

Ans. Mr. Shaffer.

Cross Q. 123. Do you know how long Mr. Shaffer lived in it before you took it?

Ans. Two years; may be three years.

Cross-Q. 124. When was that house built?

Ans. Fifteen or sixteen years ago, (1866 or 1867.)

Cross-Q. 125. Was that a stone or wooden house?

Ans. A stone house.

Cross Q. 126. Mr. Draper, in his testimony, refers to a new stone house that he had built on the hill. Is that the house you lived in?

Ans. Yes, sir.

Cross-Q. 127. Do you know why Mr. Draper called it a *new* stone house?

[*Question objected to by Mr. Storrow, as asking the witness to account for the thoughts which another witness expressed in his deposition.*]

Ans. I suppose it was the only house on the farm.

Cross-Q. 128. How far was that from the spring where your family got water for household purposes?

Ans. A little over a hundred yards.

Cross-Q. 129. Until the ram was put in, your family had to carry the water from the spring to the house, did they not?

Ans. Yes, sir.

Cross-Q. 130. Did your wife begin to make complaint about it, pretty soon after you moved there, and want the water brought nearer?

Ans. Yes, sir; we were not long there until they wanted the water up.

Cross-Q. 131. Did you speak to Mr. Draper about it, or write him about it?

Ans. I spoke to him several years before he put it in.

Cross-Q. 132. I suppose you spoke to him about it pretty soon after you found it was wearing upon your wife, did you not?

Ans. It was near onto two years before he came up, after I moved there—near onto two years before he came to see me.

Cross-Q. 133. Are you positive about that?

Ans. Yes, sir.

Cross-Q. 134. Are you as positive about that as you are about anything else you have testified to?

Ans. Yes, sir.

Cross-Q. 135. Didn't you write Mr. Draper about it before you spoke to him about it?

Ans. I don't recollect writing to him about the ram.

Cross-Q. 136. Did Mr. Draper go with you to Mr. Drawbaugh's shop about the ram, the first time that he, Draper, came up to the farm after you moved on to it?

Ans. No, sir.

Cross-Q. 137. Did he go the second time that he came up to the farm?

Ans. No, sir.

Cross-Q. 138. The third time?

Ans. That I can't say, whether it was the third or fourth time; but it was in 1877, that we were over.

Cross-Q. 139. Were you ever down to visit Mr. Draper, at or near Dover, Delaware; if so, how many times?

Ans. I was down once.

Cross-Q. 140. When was that?

Ans. In October of the year of the Centennial. From the Centennial I went down. It was 1876.

Cross-Q. 141. Wasn't your visit with Mr. Draper to Mr. Drawbaugh's shop before you went to see him at Dover, in the fall of 1876?

Ans. No, sir.

Cross-Q. 142. How long was Mr. Draper at the farm on the occasion of that visit, in the course of which you and he went down to Drawbaugh's shop to see about the ram?

Ans. I can't tell you how long he was there. I suppose he was there about six or eight days.

Cross-Q. 143. Where did he stay during that visit to the farm?

Ans. He always stayed with me, on the farm.

Cross-Q. 144. Do you recollect anything else that he did during that visit, except go down to Drawbaugh's shop with you?

Ans. The day before, we went up to what is called Little Cove, to look at a coal mine there. That is all I can recollect.

Cross-Q. 145. What did you want to look at the coal mine for?

Ans. We just wanted to look at it to see what kind of coal it was.

We found the mine was about a mile from the road, up near the top of a mountain; so we didn't go up to it. We stopped at the fertilizer-mill there, and the fertilizer man told us we couldn't see much if we did go up.

Cross-Q. 146. Who was the fertilizer man that you saw there at the fertilizer mill?

Ans. That I can't tell you—his name—now. It has got out of my memory.

Cross-Q. 147. Tell us just where that fertilizer-mill stood?

Ans. It stood about a mile and a half above Marysville, right along the Susquehanna river. I suppose not twenty yards off the river.

Cross-Q. 148. Was it the only fertilizer-mill anywhere around in the neighborhood of Marysville?

Ans. Around Marysville. There was one up at Duncannon, about three miles and a half above that mill.

Cross-Q. 149. That mill where you stopped that day is the only fertilizer-mill within three miles of Marysville; is it?

Ans. Yes, sir; there is no other around there but the little one up in Duncannon.

Cross-Q. 150. Whose plan was it to go up to see that coal mine, yours or Mr. Draper's?

Ans. We were talking about it and we made up our minds to go and see it. I had never seen it myself. So one afternoon we drove up. It was only a kind of a little spurt.

Cross-Q. 151. Is that coal mine worked now?

Ans. No, sir; it hadn't been when we left there.

Cross-Q. 152. You mean when you moved away from Marysville, do you?

Ans. Yes, sir; when I moved away from Marysville.

Cross-Q. 153. Do you mean that it never had been worked down to the time when you moved away from Marysville?

Ans. Not more than that they sunk a shaft to find out whether there was any coal there?

Cross-Q. 154. Do you know who sunk that shaft?

Ans. I do not.

Cross-Q. 155. Do you know when it was sunk?

Ans. No; I believe I can't tell the year when it was sunk.

Cross-Q. 156. Was it sunk before you and Mr. Draper went up to see it and stopped at the fertilizer mill?

Ans. Yes, sir; it was open then.

Cross Q. 157. Was your visit, when you went to see it and stopped at the fertilizer-mill, soon after the shaft was sunk?

Ans. I don't know how long the shaft was sunk before that.

Cross-Q. 158. Had you heard, before that, of the shaft having been sunk?

Ans. Yes: I heard frequently before that.

Cross-Q. 159. How long, before that, had you heard of it?

[*Mr. Storrow objects to the further continuance of this line of cross-examination as simply consuming time.*]

Ans. I can't tell you how long, some time before that.

Cross-Q. 160. Give us your best recollection?

[*Same objection.*]

Ans. My best recollection is, I suppose, about a year, may be eighteen months, before we went up.

Cross-Q. 161. Is that the only coal mine in that vicinity?

[*Same objection.*]

Ans. All I can mind of. I don't know of any other.

Cross-Q. 162. What name did it go by in the community when it was talked about?

[*Same objection.*]

Ans. It had no name, I believe, but Cove mountain.

Cross-Q. 163. How far was your farm-house, at Marysville, from Drawbaugh's shop, at Eberly's Mills?

Ans. It was called eleven miles.

Cross-Q. 164. Are those visits of yourself and Mr. Draper to the fertilizer-mill, and, the next day, to Drawbaugh's shop, at Eberly's Mills, the only things that you can remember that Mr. Draper did, during that visit to his farm?

Ans. Yes, sir.

Cross-Q. 165. What was his business to the farm, that brought him up there on that occasion?

Ans. His business was, I suppose, to come up and look at the farm, and see how it was conducted. That is about all I know. And I suppose he thought he would get a little rent.

Cross-Q. 166. Do you remember about his going around and looking at the farm, on that visit?

Ans. Yes, sir; he walked over the farm, I suppose, every time he came up.

Cross-Q. 167. What particular kind of work was going on on the farm when he was there, on that occasion?

Ans. It is hard for me to tell what we were doing.

Cross-Q. 168. Have you no recollection about it?

Ans. Not more than that when he came, I walked down into the city of Marysville with him, and we went around and spent part of the day among old acquaintances. That is all I know that he was doing.

Cross-Q. 169. What acquaintances did you see that day, at Marysville, and spend part of the day with?

Ans. I can't tell you the parties every day. We were down at Mr. Seidel's, and around. I can't tell you every day where we were.

Cross-Q. 170. You went down, then, on different days, while Mr. Draper was there with you, did you?

Ans. Yes, sir.

Cross-Q. 171. Can't you name anybody, except Mr. Seidel, that you and Mr. Draper visited at Marysville, on that occasion?

Ans. I could name the half of Marysville.

Cross-Q. 172. I mean that you visited on that occasion with Mr. Draper?

Ans. We were at old Mr. Fenn's. We went around in the machine-shop and round-house, talking to the men; and down to Mr. Eppel's, his agent's. We were down there several nights.

Cross-Q. 173. Give us the first names of Mr. Seidel, Mr. Fenn, and Mr. Eppel?

Ans. Al. Seidel, Theophilus Fenn, and Hiram Eppel.

Cross Q. 174. Did you pay Mr. Draper any rent during that visit of his to the farm?

Ans. No, sir; I think not.

Adjourned until August 4, 1882, at 10, A. M.

AUGUST 4, 1882.

Examination resumed pursuant to adjournment.

Present, same counsel.

Cross-examination of George Kissinger by Mr. Hill, continued:

Cross-Q. 175. You say that the visit of Mr. Draper and yourself to Mr. Drawbaugh's shop did not take place on the occasion of Mr. Draper's first visit to the farm after you moved upon the farm. Do you distinctly remember all about Mr. Draper's first visit to the farm after you moved there?

Ans. No, sir; I do not, any more.

Cross-Q. 176. Do you remember what time of the year Mr. Draper's first visit to the farm, after you moved there, was?

Ans. I do not. It was in the spring or early in the fall, that is after the first year. The first year he wasn't up.

Cross-Q. 177. You moved on to the farm about the 1st of April, 1874, the time the lease was made, did you not?

Ans. Yes, sir.

Cross-Q. 178. Was his first visit to the farm in the spring or fall of 1875?

Ans. No, sir.

Cross-Q. 179. What year was it?

Ans. The year after.

Cross-Q. 180. Do you mean the spring or fall of 1876?

Ans. It was in the spring or fall—I won't be positive which—of 1876.

Cross-Q. 181. Was it before or after you went to the Centennial Exhibition, at Philadelphia?

Ans. I can't tell you.

Cross-Q. 182. Don't you remember whether or not Mr. Draper had been to the farm, after you moved on to it, before you visited him at Dover, Delaware?

Ans. No; I can't recollect that.

Cross-Q 183. Where did Mr. Draper stay during his first visit to the farm after you moved there?

Ans. He stayed with me on the farm.

Cross-Q. 184. How long did he stay with you on that visit?

Ans. I can't tell you, sir.

Cross-Q. 185. What were you doing on the farm while he was there on that visit?

Ans. That I can't tell you.

Cross-Q. 186. Did he do any business that you know of in that neighborhood while he was there on that visit; if so, what, and with whom?

Ans. No, sir.

Cross-Q. 187. Did you have any business transaction with anybody, that you can now think of, while he was there on that visit; if so, what, and with whom?

Ans. I don't think I had any transaction at all with anyone.

Cross-Q. 188. Did you have anybody working for you on the farm at that time, if so, who?

Ans. My two sons here. I think three of my sons were home then, to the best of my recollection. I didn't have any hired man.

Cross-Q. 189. What are the names of your three sons?

Ans. The oldest one is George Franklin Kissinger, the next oldest is Cyrus Henry Kissinger, and the next is John Morris Kissinger.

Cross-Q. 190. Did all three work for you the first four years that you were on the farm?

Ans. Sometimes they were at home and sometimes they were not. They worked off and on. Some went west and came back, and went west again.

Cross-Q. 191. How long after Mr. Draper's first visit to the farm was his second visit there?

Ans. If my mind carries it right, it was the fall of 1877.

Cross-Q. 192. Did he make more than one visit there in the year 1877?

Ans. He only made one visit, I think, if my memory carries me right.

Cross-Q. 193. Was he there at any time during the year 1878?

Ans. In the fall of 1878.

Cross-Q. 194. What time in the fall?

Ans. In November, if I am not mistaken.

Cross-Q. 195. Was that the only time he was there, in the year 1878?

Ans. Yes, sir.

Cross-Q. 196. When Mr. Draper was there on his second visit after you moved there, did he stay with you on the farm?

Ans. Yes, sir.

Cross-Q. 197. What were you doing on the farm at that time?

Ans. I don't think I was doing anything. I was visiting with him around.

Cross-Q. 198. Where did you go with him during that second visit of his to the farm?

Ans. Around through the village.

Cross-Q. 199. Did you go anywhere else with him during that second visit of his to the farm?

[*Objected to by Mr. Storrow, for the reason that the whole history of that visit was fully gone into yesterday.*

Mr. Hill objects to the objection as an improper interference with the cross-examination.

Mr. Storrow replies to that objection, that it has no weight unless the interrogatory was such as to confuse and mislead the witness and court as to the visit inquired of.

Mr. Hill repeats his protest against the interference with the cross-examination; and if it is repeated, will make it the ground of a motion to suppress the deposition.]

Ans. It was the same visit that we went to see about the ram; it was in 1877.

Cross-Q. 200. In your one hundred and thirty-sixth, one hundred and thirty-seventh, and one hundred and thirty-eighth answers, you testified positively that you did not go to Drawbaugh's shop with Mr. Draper about the ram the first time that Draper came up to visit the farm after you moved on to it, nor the second time that he came up there to the farm, and that you can't say whether it was the third or fourth time; and now you testify that it was on his second visit to the farm, that you went with him to see about the ram. Do you really know on what visit it was that you went to Mr. Drawbaugh's shop?

Ans. It was in 1877. It is so long that I can hardly recollect it. I think that it was the second visit, but I am not positive. The first visit was in the spring or early fall the year after I moved there. That was the first visit. Now, the next visit I thought was late in the winter, but since I reflect I think the second visit was about eighteen months from the time I moved on the farm, if my mind now carries me right.

Cross-Q. 201. And you think that it was on the second visit that you and Draper went to Drawbaugh's shop, do you?

Ans. I think, since I reflect, that that is as near as I can get at it. I think it was.

Cross-Q. 202. You think it was the second visit that you and Draper went to Drawbaugh's shop?

Ans. Yes, sir; as near as my memory will carry me. I have been studying over it ever since I have been down here.

Cross-Q. 203. When you first put in the ram, between the spring and your house, how much wooden pipe did you put in?

Ans. That is more than I can tell you now.

Cross-Q. 204. Was the wooden pipe put in next to the house or next to the ram?

Ans. Next to the spring.. There were two joints of iron next to the ram to keep it from bursting.

Cross-Q. 205. Was the most of the pipe between the ram and the house made of iron or of wood?

Ans. All iron pipe.

Cross-Q. 206. The pipe from the spring to the ram was how long?

Ans. I can't tell you to the right foot, but it was about two hundred and six feet. It was over two hundred feet.

Cross-Q. 207. Who bored the wooden pipe that was used in connection with that ram?

Ans. I bored it myself. I had a little help.

Cross-Q. 208. Who helped you to bore it?

Ans. My boys helped me principally.

Cross Q. 209. Did anybody else besides your boys?

Ans. I think not.

Cross-Q. 210. The wood that you bored to make the pipe, did you get it on the farm?

Ans. Yes, sir.

Cross-Q. 211. Where did you get the auger that you used in boring the pipe?

Ans. From Mr. Keller. I can't tell you his first name now.

Cross-Q. 212. Where did he live then and where does he live now?

Ans. He lived then a little over seven miles from Marysville, up the valley. I suppose he lives there yet.

Cross-Q. 213. How do you go to get to his place from Marysville?

Ans. Right up the valley from Marysville. There is a public road up there. You turn to the left from the Susquehanna river and go up the valley between the two mountains. He lives right along the road, it is called the "Valley road."

Cross-Q. 214. What is his business?

Ans. Farming.

Cross-Q. 215. Did you borrow the auger, or hire it and pay him for it?

Ans. When I got the auger, I asked him what he would charge me. He said he didn't know, but thought it ought to be worth a dollar. I never paid it. I took the auger back, but he wasn't there. He never said nothing to me since.

Cross-Q. 216. Who came to see you about giving your testimony here, on behalf of the Bell Telephone Company?

Ans. There was a man to see me a little over a year ago. I don't know who he was.

Cross-Q. 217. Did he give his name at the time?

Ans. No, sir.

Cross-Q. 218. Did he say he was a lawyer?

Ans. No, sir.

Cross-Q 219. Has anybody been to see you recently for the Bell Telephone Company; if so, who?

Ans. This man (indicating Mr. Storrow) and Mr. John Comfort.

Cross-Q. 220. Mr. Comfort that lives just above Eberly's Mills?

Ans. Yes, sir.

Cross-Q. 221. Referring to the man who first came to see you for the Bell Telephone Company, as you state, was his visit in summer or winter?

Ans. It was the forepart of the winter, if I ain't mistaken.

Cross-Q. 222. Was it this last winter?

Ans. Yes, sir.

Cross-Q. 223. Was it not about the last part of January last.

Ans. I thought it was about the first part of the winter—about eight or ten days before Mr. Drawbaugh and Mr. Jacobs came.

Cross-Q. 224. Mr. Drawbaugh and Mr. Jacobs are the parties you referred to, in your direct examination, as "Mr. Drawbaugh and his counsel," are they not?

Ans. Yes, sir.

Cross-Q. 225. Was it about eight or ten days before their first visit to you, or before their second visit to you?

Ans. The second visit.

Cross-Q. 226. When that man came, on behalf of the Bell company, to see you, at that time, did he say anything about going to see Mr. Draper on the same matter?

Ans. He came from Draper's to my house. Mr. Draper sent him to me.

Re-direct by Mr. Storrow:

Q. Q. 227. You have testified, several times, both yesterday and to-day, that the visit to Drawbaugh's shop with Mr. Draper was during the year before the ram was put in. I want to know, now, whether you have or have not any doubt on that point?

Ans. I have no doubt it was the year before, as near as I can recollect. If my mind carries me right, it was the year before I don't want to say a thing that aint so. I want to be correct.

Q.-Q. 228. You seem to have been somewhat uncertain about the dates of Mr. Draper's visits to the farm, and how many there were. I want to know whether or not, in spite of that, you are still satisfied that the visit to Drawbaugh's shop with Mr. Draper, was the year before the ram was put in, as you have just stated, and not three or four years before?

[*Objected to by Mr. Hill, as leading, and because the witness' memory has already been exhausted on that subject.*]

Ans. The year before. My mind won't lead one any other way than that.

Re-cross-examination by Mr. Hill:

Re-cross-Q. 229. After the ram was put in, how often did Mr. Draper visit the farm, while you lived there?

Ans. My best recollection is that the first fall after the ram was put in him and his wife was up. He wrote me that I should hurry and get the ram in, as he was going to bring his wife up. The next fall after that him and his daughter was up; and then in the spring I had sale, and he came the night before the sale. That was the first sale; and that, I think, was the last visit he made on the farm while I was there.

Re-cross-Q. 230. How long was your first sale before you moved off the farm?

Ans. I think the first sale was on the twentieth of March. I think I moved on the twenty-eighth, and got to the Eastern Shore on the first day of April.

Re-cross-Q. 231. Were any members of his family ever with him on any of his visits to the farm, while you lived there, before the ram was put in?

Ans. I think not. His son John was with him, I think, after the ram was put in. I think his son John came up for two horses or colts he had bought up there, and took them home; but what time that was, I couldn't tell.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 4th day of August, 1882.
FRED. M. OTT, *Examiner.*

GEO. W. KISSINGER.

JOHN MORRIS KISSINGER, being produced, sworn, and examined, saith:

Examined by Mr. Storrow:

My age is twenty-three; residence, Chicago, for the last five years; I have been in the livery business for three years.

Q. 1. Are you the son of Mr. George Kissinger, who has just testified?

Ans. Yes, sir.

Q. 2. Did you live at Eberly's Mills from April, 1871, to April, 1874, when your father lived there?

Ans. Yes, sir.

Q. 3. Did you move to Marysville with him in April, 1874?

Ans. Yes, sir.

Q. 4. Whilst he lived at Marysville did you live with him all the time, or were you away part of the time; and if the latter, state when you lived away?

Ans. The summer of 1874, the summer of 1875, and part of the summer of 1876 I lived at home; I left home on the twelfth day of August, 1876, for Chicago. I stayed there until the fall of 1877—I suppose, along about the twentieth of December, 1877—when I came back. Then I stayed home until the twenty-seventh day of May, in 1878. On the twenty-seventh of May I started to Chicago. After that I never was back to the Marysville house.

Q. 5. While you were at home at Marysville, from Chicago, from the latter part of December, 1877, to the latter part of May, 1878, was there any work going on at your father's place, about getting in a hydraulic ram to throw water up to the house?

Ans. Yes, sir.

Q. 6. Was the ram in and working, at that time?

Ans. No, sir.

Q. 7. What preparations were they making for it?

Ans. They had the logs down, and were boring at them, when I got home, and I helped to finish the logs. The logs were all bored when I left.

Q. 8. Did you ever see the ram in and working there?

Ans. No, sir.

Q. 9. Was there any ram there, at the time of that visit?

Ans. No, sir.

Q. 10. While you lived at your father's house, at Marysville, what was your occupation?

Ans. The best part of the time I was helping to grade for the new coal-shutes on the railroad, there.

Q. 11. What was your occupation the first year you lived at Marysville?

Ans. Helping my father on the farm.

Q. 12. Did you work on a farm any during the three years that you lived at Eberly's Mills?

Ans. Not the first summer, I didn't.

Q. 13. Whose farm did you work on the second and third summers?

Ans. The second summer I worked for Levi Miller, between Eberly's Mills and New Cumberland; the third summer I worked for Ez. Gilbert, who lives in the big stone house right adjoining Eberly's Mills.

Q. 14. Did you live at home during the winters?

Ans. Yes, sir.

Q. 15. How much were you in the habit of going to Drawbaugh's shop while you lived at Milltown?

Ans. We used to get there every Sunday, most; maybe two or three times.

Q. 16. Did you get down there week-days and see him at work, ever?

Ans. Not after the first summer.

Q. 17. Did you ever see anything there that he told you were talking machines, or telephones?

Ans. No, sir.

Q. 18. While you lived at Eberly's Mills, did you ever hear of his having a talking machine, or telephone?

Ans. No, sir.

Q. 19. When you would go to his shop, while you lived there, were you in the habit of seeing his various inventions and contrivances?

Ans. Yes, sir. I would get to see some of them. I wouldn't get to see them all.

Q. 20. Do you think, from your familiarity there, that he could have been in the habit of showing a speaking telephone, and using it to speak from one part of the shop to another, without your seeing it or hearing of it?

[*Objected to by Mr. Hill, as leading, argumentative, calling for mere opinion, and otherwise incompetent.*]

Ans. No, sir.

Q. 21. Were there any particular fellows that you were in the habit of being with, while you lived at Eberly's Mills? If so, who were they?

Ans. There was Bill Fettrow, Bill Frownfelter, George and Lewis Row, Norman Kahney, and John Heck.

Q. 22. Who were their fathers, and where did they live?

Ans. Will Fettrow's father's name was Daniel Fettrow, blacksmith; he lived right there in town. Amos Frownfelter, (Bill's father,) lived in town. I don't know what Mr. Row's first name was. He was a cooper, about a quarter of a mile out towards White Hill station. Mr. Kahney was also a cooper by trade, and generally worked for Row. He lived in town. John Heck's father had a little place there in town, and he generally worked out among the farmers. His name was Billy Heck.

(Recess for dinner, until 2.30, P. M.)

AUG. 4, 1882.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Examination of John M. Kissinger, by Mr. Storrow, continued:

Q. 23. When did Amos Frownfelter move there, and when did he move away, if you recollect?

Ans. They moved there the same spring we did, and moved away when we did.

Q. 24. When will you be twenty-four years old?

Ans. The twenty-fifth of September, 1882.

Cross-examined by Mr. Hill.

Cross-Q. 25. When you moved to Eberly's Mills you were about twelve and a half years old, and when you moved away from there you were fifteen and a half years old. Were you not?

Ans. Yes, sir.

Cross-Q. 26. Name all the persons you ever saw in Drawbaugh's shop, while you lived at Eberly's Mills.

Ans. There was Dan Drawbaugh, Harman Drawbaugh, George Drawbaugh; that is all my recollection.

Cross-Q. 27. Name all the inventions of Mr. Drawbaugh that you ever saw at his shop while you lived there.

Ans. There he had that battery-machine for one; and he had that rag-sewer; and a patent fly-chaser attached to the ceiling. That is about all that I can recollect.

Cross-Q. 28. Have you ever been in the shop since you moved away from there, in 1874?

Ans. No, sir.

Cross-Q. 29. Did you ever take any shocks from the battery-machine while you lived there?

Ans. Yes, sir.

Cross-Q. 30. Did you see an electric clock in the shop while you lived there?

Ans. No, sir; not to my recollection.

Cross-Q. 31. Did you ever see a nail machine in Mr. Drawbaugh's shop while you lived there?

Ans. Yes, sir.

Cross-Q. 32. Where was it?

Ans. In the basement.

Cross-Q. 33. Where did Amos Frownfelter move to when he moved away from Eberly's Mills in the spring of 1874?

Ans. He moved on old man Heck's place, over back of West Fairview.

Cross-Q. 34. How far was old man Heck's place from Drawbaugh's shop?

Ans. That is something I couldn't tell you.

Cross-Q. 35. Were you ever there?

Ans. Yes, sir; I was there once, with Amos Frownfelter, while we lived in Milltown.

Cross-Q. 36. It isn't over three or four miles from Drawbaugh's shop, is it?

Ans. That is something I couldn't say. They count it five miles from Milltown to West Fairview, I believe.

Cross-Q. 37. Was old man Heck's place between West Fairview and Milltown?

Ans. No, sir; it was on another road entirely.

Cross-Q. 38. When you went over with Amos Frownfelter, did you ride or walk?

Ans. We rode. He drove a four-horse team over, and I was in the wagon.

Cross-Q. 39. How long did it take you to go from Milltown to old man Heck's place?

Ans. I have no idea.

Cross-Q. 40. Do you remember the old saw-mill that used to stand on the run a short distance from the creek at Milltown?

Ans. Yes, sir.

Cross-Q. 41. That was old man Heck's saw-mill, was it not?

Ans. Yes, sir; It wasn't worth much though, while we lived there.

Re-direct by Mr. Storrow.

Q. Q. 42. Did Will Frownfelter and some of the other fellows you have mentioned, use to go to Drawbaugh's shop with you?

[*Objected to by Mr. Hill, as the witness has already testified that nobody was at the shop but Daniel Drawbaugh, Harman Drawbaugh, and George Drawbaugh.*]

Ans. Yes, sir.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me this 4th day of August, 1882.
FRED. M. OTT, *Examiner.*

JOHN M. KISSINGER.

SAMUEL G. GEIB, being produced, affirmed, and examined, saith:

Examined by Mr. Storrow:

My age is twenty-four; residence, Marysville, Perry county, Pa.; I am railroad agent for Pennsylvania and Northern Central railroads, at that place.

Q. 1. Please look at the Pennsylvania railroad book of "freight received" at Marysville station, referred to in the twenty-second question to George W. Kissinger, and particularly at the freight receipt, No. 485, put in evidence after his twenty-fourth answer, and tell me what that book is, and whether it is in your official custody as station agent.

Ans. This is the receipt-book of the Pennsylvania railroad for freight received, and is one of the books of my office.

Q. 2. In whose handwriting is the receipt, except the signature of Mr. Zimmerman?

Ans. The handwriting is mine.

Q. 3. Did you receive and fasten into the book, at the time, the order of Drawbaugh and Kissinger, now attached to that receipt?

Ans. The order was received by my father, who was then freight agent, and was fastened in by me, to the best of my recollection.

Q. 4. What was your occupation in your father's office at that time?

Ans. I was his clerk.

Q. 5. Was that pipe delivered under those orders and that receipt—485?

Ans. It was.

Q. 6. That receipt, 485, is dated at the top, "July 2nd, 1878;" what does that date mean?

Ans. The day that the pipe was received.

Q. 7. The order from Mr. Drawbaugh was a little more than two months after that. Do you remember the circumstance of that pipe remaining in the ware-house a considerable time before it was taken away?

Ans. The pipe being consigned to Mr. Drawbaugh, Mr. Zimmerman could not lift it until he had an order from Drawbaugh. It took some time, I suppose, to get that; and there may have been other delays that I don't recollect. That was one of them.

[*Suppositions of the witness objected to by Mr. Hill, as incompetent.*]

Q. 8. That receipt states that the pipe came from Philadelphia, under manifest No. 22,694; will you please produce that manifest, that a copy of it may be made a part of your deposition?

Ans. I did not bring it, but I have sent for it, and expect it this evening. I remember that it was dated at Philadelphia, July 1, 1878.

[The manifest is as follows:

Manifest.
No. 22694

FORM NO. 9—B.—SPECIAL.

PENNSYLVANIA RAILROAD.

July 1, 1878.

ROAD MANIFEST OF MERCHANDISE *forwarded from* PHILADA. *to* MARYSVILLE.

Printed in Copy Ink.

CAR.		Consignor.	Consignee.	Description of Articles.	Weight.	Rate.	Freight.	Expenses.	Prepaid.	To be Collected.
Initial.	Number.									
P.-R. R.	462		D. Drawbaugh, Marysville.	Bdle. Pipe, 2–165.	165	21	35			35

Bill 485.

R. 2.]

Q. 9. Do you remember when I came up to you in the spring and got you to show me this entry?

Ans. Yes, sir.

Q. 10. Had you shown it to anybody before that this spring?

Ans. I had not. To the best of my recollection, that is the only time it was shown to anybody since the freight was received.

Cross-examined by Mr. Hill.

Cross-Q. 11. Have you shown it to anybody since that; if so, who?

Ans. I have not.

Examination taken, reduced to writing
and by the witness affirmed and subscribed
before me this 4th day of
August, 1882.
FRED. M. OTT,
Examiner.

SAM'L G. GEB.

George F. Kissinger being produced, sworn, and examined, saith:

Examined by Mr. Storrow:

My age is thirty-five. Residence, Talbot county, Md., near Easton. I am a son of George Kissinger, who has testified. I am a laborer. I live with my father, and work on the farm with him.

Q. 1. Did you live with your father at Marysville, from April, 1874, to April, 1880?

Ans. Yes, sir; excepting about two months that I was away.

Q. 2. While you lived with your father, at Marysville, what was your occupation?

Ans. Working on the farm with him.

Q. 3. Do you remember that a hydraulic ram was put on to the place to throw water up to the house, while you lived there?

Ans. Yes, sir.

Q. 4. It appears from the papers, that the iron pipe for that ram was brought to the place sometime after the eighth of September, 1878. Did the ram come there before or after that pipe?

Ans. To the best of my recollection, it came after the pipe was delivered.

Q. 5. How late in the season did it get to be, and how cold did the weather grow, before the ram got to working?

Ans. It was about the last of the month.

Q. 6. Do you remember anything about the weather affecting the ram, before the work of setting it was completed?

Ans. Yes, sir; if I am right, the water froze in the pipe over night, and bursted two pieces.

Q. 7. Was that before the pipe was buried in the trench, or afterwards?

Ans. Before it was put into the trench.

Q. 8. Do you remember the fact of your father and Mr. Draper going over to Drawbaugh's shop, to see about purchasing the ram?

Ans. Yes, sir.

Q. 9. How many seasons, before the ram was put in, was it, that they went over there about it?

Ans. It was the fall before, if I am right.

Q. 10. Did you live with your father at Milltown, from April, 1871, to April, 1874?

Ans. I had my home there.

Q. 11. Where did you work during those three years?

Ans. The first year, 1871, I stayed in Marysville till late in the fall. And the second year, 1872, if I am right, I was down at Lochiel.

Q. 12. In 1873, where?

Ans. I was working for the Pennsylvania Railroad Company.

Q. 13. What were you doing for them?

Ans. I was working on the telegraph line.

Q. 14. Did you work for these parties during the winters, or stay at your father's during the winters?

Ans. I stayed at home during the winter.

Q. 15. Did you use to go to Mr. Drawbaugh's shop while you lived at Eberly's Mills?

Ans. Yes, sir.

Q. 16. Did he show you any telephones, or tell you that he had any telephones, while you lived at Eberly's Mills?

Ans. Not to my knowledge.

Q. 17. Do you recollect of ever having heard, while he lived at Eberly's Mills, that he had a telephone?

Ans. No, sir.

Q. 18. Do you remember the fact of Mr. Drawbaugh and his counsel coming to your father's about eighteen months ago?

Ans. Yes, sir.

Q. 19. Did they show you a pair of instruments at the same time that they showed them to your father?

Ans. Yes, sir; they had them there in the room.

Q. 20. Could you then indentify them as anything you had seen before?

Ans. That is more than I can say.

Q. 21. Please look at the two instruments now shown you, marked "F" and "B," and tell we whether they are, or are not, the two that Mr. Drawbaugh had at your father's house, at that visit, eighteen months ago?

[*Mr. Hill objects to the question as essentially leading and suggesting, and submits that the fairest and proper way to interrogate the witness is to submit to him all of the instruments here, without designating any in particular, and then ask him whether he can identify the particular instruments which Mr. Jacobs and Mr. Drawbaugh had at his father's house at that time.*

Mr. Storrow says that he makes the inquiry in the same way that the defendants made their inquiry eighteen months ago.

Mr. Hill replies that it has not yet been shown how many, nor which instruments Mr. Drawbaugh and Mr. Jacobs showed to the witness at his father's house, and, further, that as a matter of fact, these two instruments, "F" and "B," are not the only instruments that Mr. Drawbaugh and Mr. Jacobs showed there at that time as he (Mr. Hill) is now informed by Mr. Jacobs.]

Ans. They were something on that order.

Q. 22. Do you remember ever having seen those instruments, or instruments like them, while you lived at Eberly's Mills?

Ans. Not to my knowledge.

Cross-examined by Mr. Hill.

Cross-Q. 23. When you were working for the Pennsylvania Railroad Company, on telegraph lines, what was the work that you did?

Ans. In repairing the old lines.

Cross-Q. 24. What did you do?

Ans. I dug holes sometimes.

Cross-Q. 25. When you lived at Eberly's Mills, from 1871 to 1874, were you in Drawbaugh's shop very often?

Ans. Yes, sir; excepting some weeks.

Cross-Q. 26. Name all the machinery that you saw there in the shop during that time?

Ans. The nail-machine, I saw that, those faucets, and a knitter, or whatever you call it.

Cross-Q. 27. Is that all that you remember of seeing there in those three years?

Ans. That is all that I remember just now.

Cross-Q. 28. Did you see an electric clock there?

Ans. I did not.

Cross-Q. 29. While you lived there at Eberly's Mills, did you ever hear anybody say anything about Drawbaugh's having an electric clock?

Ans. Not to my knowledge.

Cross-Q. 30. Name all the persons that you can remember of having seen at Drawbaugh's shop in the three years that you lived at Eberly's Mills?

Ans. Daniel Drawbaugh, Squire Drawbaugh, George Drawbaugh, Harman Drawbaugh; that is about all that I can remember just now.

Cross-Q. 31. Were you ever over to old man Heck's farm, where Amos Frownfelter moved?

Ans. I was not.

Cross-Q. 32. Can you swear that you ever saw these two instruments, "F" and "B," before you saw them here to day on the table?

Ans. I saw those, to the best of my recollection, at the house there, when they had them up. If I am right, there was another one besides those two.

Cross-Q. 33. I suppose you talked over, with your father, the matter of the ram and the date of the visit of your father and Mr. Draper to Mr. Drawbaugh's shop after Mr. Jacobs and Mr. Drawbaugh left your father's place, did you not?

Ans. Not to my knowledge.

Cross-Q. 34. Did you talk it over while Mr. Jacobs and Mr. Drawbaugh were there?

Ans. No, sir.

Cross-Q. 35. Your father testified that Mr. Draper directed a man to your father's place, a few months ago, who, in the interest of the Bell Telephone Company, wanted to know about the date of that ram, and the visit of your father and Draper to Drawbaugh's shop. Did you see that man when he was at your father's place?

Ans. Yes, sir.

Cross-Q. 36. Did you talk over the matter with him?

Ans. Yes, sir.

Cross-Q. 37. Did you talk over the matter with your father about the same time?

Ans. Yes, sir; to the best of my knowledge.

Cross-Q. 38. Do you remember the second visit of Mr. Jacobs and Mr. Drawbaugh to your father's place, which was some time last winter, a week or ten days after that man was there?

Ans. Yes, sir.

Cross-Q. 39. Did you talk over the ram matter with your father again about that time?

Ans. I am not positive.

Cross-Q. 40. You can't remember all the times that you have talked over the matter with your father, can you?

Ans. I only talked it over once, to my recollection.

Cross-Q. 41. Your father testified that Mr. Storrow and Mr. John Comfort were at his place recently. Did you see them when they were there?

Ans. Yes, sir.

Cross-Q. 42. Did you talk over the matter with them while they were there?

Ans. We told them the date that we had fixed upon.

Cross-Q. 43. When Mr. Jacobs and Mr. Drawbaugh came to your father's house last winter, late in the evening after the family had gone to bed, did you see them?

Ans. No, sir.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this fourth day of August, 1882.
FRED. M. OTT, *Examiner.*

GEO. F. KISSINGER.

[The register of "Haddaway's European House," Easton, Md., under date of Tuesday, February 7, 1882, has the names of "M. W. Jacobs" and "Daniel Drawbaugh," and it is admitted that that is the date of the second visit of those gentlemen to Mr. Kissinger's, referred to in the testimony.]

Adjourned to meet on notice.

FRED. M. OTT,
Examiner.

AUGUST 4, 1882.

PHILADELPHIA, PENNA., TUESDAY, *November* 21, 1882.

Examination resumed, pursuant to agreement of counsel, at the Hotel Lafayette, Broad street, below Chestnut, at seven o'clock, P. M.

Present, Mr. Smith and Mr. Storrow for complainants, and Mr. Hill and Mr. Jacobs for respondents.

RUFUS E. SHAPLEY *being produced, sworn, and examined, saith:*

Examined by Mr. Smith:

I reside in Mechanicsburg, Cumberland county, Pennsylvania; I keep a jewelry store and do watch repairing.

Q. 1. How long have you resided in that place?

Ans. Since the fall of 1865.

Q. 2. Have you heretofore been acquainted with Daniel Drawbaugh, of Eberly's Mills, Cumberland county, Pennsylvania? If so, will you state when you first became acquainted with him, as near as you can?

Ans. I think I formed his acquaintance in 1876.

Q. 3. Where was he residing at that time, and where was his place of business?

Ans. He resided at Mechanicsburg, and his place of business was at Eberly's Mills; I may have met him before that, once.

Q. 4. Do you remember how long he resided at Mechanicsburg, and whether you saw him frequently during the time that he did reside there?

Ans. I do not remember how long he resided there; I met him frequently at my place of business.

Q. 5. Did you visit his place of business at Eberly's Mills during the time he resided at Mechanicsburg; and, if so, how came you to go there?

Ans. I visited his place while he resided at Mechanicsburg; my object was to see an electric clock that he was making.

Q. 6. How came you to know anything about this clock?

Ans. By a description that he had given me of it.

Q. 7. State whether or not he had any talk with you about taking an interest in this clock, and whether or not he invited you to go to his place of business to see it.

Ans. Prior to my visit to his place, I think he spoke nothing to me about taking an interest in it; but he invited me to come down and see the clock.

Q. 8. Before that time, had you any knowledge of electric clocks?

Ans. I knew that Himmer, of New York, had an electric clock.

Q. 9. I intended to inquire as to your knowledge of their construction and the way in which they were operated; what knowledge had you in relation to such clocks?

Ans. I had never seen the Himmer clock at that time.

Q. 10. Will you state whether or not Mr. Drawbaugh represented his clock to be a new invention of his own, and whether or not you visited his place with the belief that the clock was an invention which he had made?

Ans. He claimed it as an invention of his, and I went to see it with that understanding.

Q. 11. Can you state what time it was when you made your first visit to his shop, and who, if any person, accompanied you?

Ans. It was in October of 1876, and I. D. Landis, of Coatesville, Pennsylvania, accompanied me.

Q. 12. What relation is Mr. Landis to you, and how came he to accompany you on that visit to Mr. Drawbaugh's shop?

Ans. He is a brother-in-law of mine, and I requested him to go along to see the clock.

Q. 13. Did he come to your place for the purpose of making that visit, or did he happen to be there casually?

Ans. He did not come there for that purpose, but happened to be there.

Q. 14. State whether or not you saw Mr. Drawbaugh at his shop, and whether or not he showed you his clock? and if so, state what was the condition of the clock? what were its features?

Ans. We met Mr. Drawbaugh there, and we saw the clock and he explained it to us; it was driven by an earth battery.

Q. 15. Will you state where the clock was situated, and give some description of its size and appearance?

Ans. I suppose you would call it an office; it was hanging on the partition on the left, as you went in the room.

Q. 16. On which floor?

Ans. On the second floor; I suppose the clock was four or five feet long, and had a paper dial and wooden hands; the case was not completed.

Q. 17. State whether or not he had any other clocks which were operated in any way by electricity; and if so, state what clocks they were and how they were operated.

Ans. He had a small six or eight square clock driven by an old English clock.

Q. 18. Was there an electrical connection between these two clocks, and if so, what kind of battery was used?

Ans. There was electrical connection; I don't know whose battery, but it was an acid battery.

Q. 19. State whether or not you examined the works and workmanship of the clock first spoken of—the one run by an earth battery.

[*This whole line of examination about the clocks objected to by Mr. Hill, as irrelevant and immaterial.*]

Ans. I did.

Q. 20. Did Mr. Drawbaugh at that visit show you and Mr. Landis any other things about his shop which he had invented or experimented with, or which he had in use and had made, himself?

Ans. Yes, sir.

Q. 21. State whether or not he took you about to various parts of the shop to show you things; and if so, what parts of the shop you visited.

Ans. I believe we were only on that floor; our time was limited.

Q. 22. Can you name any other machines which he showed you at that time?

Ans. We saw several bells which were rung by electricity, and an alphabetical telegraph, and an instrument he called a telephone.

Q. 23. Where was this instrument he called a telephone, and how came he to show it to you?

Ans. The instrument was lying on a table near the clock—in the same room.

Q. 24. Can you give any description of this instrument, as you saw it on that occasion?

Ans. I suppose the board might have been twelve or fourteen inches long, by about five inches wide and an inch thick, with a tin can on, about three inches in length and perhaps two inches and a half in diameter, fastened to the board with a band. The can was lined with plaster of paris, and had a membrane over it, and an electro-magnet to it.

Q. 25. Was it connected with any other instrument, or with the table or building in any way?

Ans. Not at the time I saw it.

Q. 26. What, if anything, did Mr. Drawbaugh say about this instrument when he showed it to you?

Ans. I understood Mr. Drawbaugh to say that he had it up around the shop.

Q. 27. Were there any wires connected to it at the time you saw it at that visit?

Ans. There was not.

Q. 28. Did he say anything about any use that he had made of it, or about what use might thereafter be made?

Ans. I think I understood Mr. Drawbaugh to say that they had spoken with it, but I do not remember that he made any remark about any use that should be thereafter made of it.

Q. 29. Will you look at the instruments now on the table before you marked "F," "B," "D," "E," and "A," and state whether you recognize either of them as being the instrument which he showed you at that time, or like it?

Ans. This is it, (taking up instrument "B;") I recognize it as being like the one I saw; I do not remember of seeing "A," nor "D," and "E;" I really don't remember of seeing "F."

Q. 30. State whether or not Mr. Drawbaugh said anything to you about having any other instrument which he called a telephone, except the instrument you have already described, or whether you saw any other instrument there which he called a telephone.

Ans. I do not remember that he said he had any other, nor do I remember of seeing any other.

Q. 31. Will you look at the instruments I now show you marked "C, re-produced," and "I," and state whether you saw them on that visit to the shop, or instruments like them?

Ans. No, sir; I did not see anything like "C, re-produced;" he had an instrument with the knob on the end of the magnet which he rocked; that was not in the same room in which the telephone was. I do not remember of seeing an instrument like "I" nor like "C."

Q. 32. Did he say anything about what the instrument, which had a magnet to be rocked, was to be used for?

Ans. I do not remember; our time was very short there—just between trains—an hour and something like forty minutes I think it was; I am not positive, but think that the train was between one and two o'clock down and five back.

Q. 33. You say that the instrument which had the rocking magnet was in another room from the one in which the telephone was? What other rooms were you in, and why did you go into them?

Ans. There is three rooms on that floor that we went in, as Mr. Drawbaugh was kind in showing us around.

Q. 34. Do you remember seeing a machine for covering wire with thread?

Ans. Yes, sir.

Q. 35. Where was that?

Ans. It was in the room where this rocking magnet that I speak of was.

Q. 36. Do you remember any other machinery that you saw there at that time which was in use in the shop?

Ans. Yes, sir.

Q. 37. Can you state generally what it was?

Ans. In the main part of the shop was his lathes for turning iron and his machinery for grinding those axles, and drilling machines.

Q. 38. What axles do you refer to?

Ans. There was a patent axle there with a cone on the end for taking up the wear, I believe.

Q. 39. If you had at that time seen any of the instruments besides "B" to which your attention has been called, do you think you should have remembered them as well as you have remembered "B"?

[*Objected to by Mr. Hill, as calling for mere opinion, and incompetent.*]

Ans. I think if Mr. Drawbaugh had called my attention to it, I would.

Q. 40. Did Mr. Drawbaugh at that time, or at any subsequent visit which you may have made, take you into the attic of the building; and if so, for what purpose?

Ans. At that time I believe not, though afterwards he did; he showed me a great many patterns that he had made of different things.

Q. 41. Did you at any subsequent visit see the instrument marked "B," or either of the other instruments to which your attention has been called?

Ans. I think I saw this instrument "B;" it was lying, I think, at the same place; I did not see any of the others that I recollect.

Adjourned until November 22, 1882, at nine o'clock, A. M.

NOVEMBER 22, 1882, 9 o'clock, A. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Examination of Rufus E. Shapley by Mr. Smith continued:

Q. 42. Referring to your answer to the 32d interrogatory, where you speak of the time which you spent at Drawbaugh's shop, and of the times when the trains run, I understood you to say that you were at Drawbaugh's shop about an hour and forty minutes, but it is perhaps not clear that that was your meaning; state whether or not you did mean to be so understood.

Ans. I did.

Q. 43. After that visit did you make any arrangement with Mr. Drawbaugh to have an interest in the clock? If so, how soon after your visit was the arrangement made?

Ans. I did, about five weeks after that—about five or six weeks.

Q. 44. Was that arrangement in writing?

Ans. Yes, sir.

Q. 45. If you have that writing will you now produce it, to be taken down as part of your deposition?

Ans. Yes, sir.

(Witness produces paper of which the following is a copy.

"MECHANICSBURG, *Nov.* 8th, 76.

For valuable consideration I do hereby sell R. E. Shapley one half intrest in ———— Clock I am getting up, the sade R. E. Shapley to pay for the Patenting of same.

DAN'L DRAWBAUGH."

Said writing and its contents, so far as they may be intended to be used for any purpose except for fixing the date, are objected to by Mr. Hill as immaterial and irrelevant.

By consent the above copy is introduced in evidence instead of the original, the original to be produced when called for.)

Q. 46. I notice that this agreement bears date at Mechanicsburg; at what place at Mechanicsburg was it made?

Ans. In my store.

Q. 47. At the time this agreement was made did you loan Mr. Drawbaugh any money; and if so, did you take any memorandum of it? And if you did take a memorandum, will you produce it, to be copied as a part of your deposition?

Ans. I did.

(Witness produces the following paper, a copy of which is by consent substituted for the original; the original to be presented when called for.

"MECHANICSBURG, *Nov.* 8th, 76.

Thirty days after date I Promis to pay R. E. Shapley twenty dollars without defalcation for value received.

$20.00.

DAN'L DRAWBAUGH.")

Q. 48. Has this note ever been paid by Mr. Drawbaugh, in whole or in part?

Ans. He has done me some little work.

Q. 49. Has there ever been any settlement between you showing the balance, if any, between the amount of the note and the amount of the work which he had done?

Ans. There has not.

Q. 50. Had there been at or before the time when these papers were made any arrangement to have Mr. Drawbaugh bring to your shop and set up the clock which you saw at his shop, and which was run by an earth battery?

Ans. There had; the clock was at my store at the time the papers were made.

Q. 51. Had it then been set to running or was it set to running about that time? and if you have any memorandum showing any expenses which you incurred in relation to the clock, will you produce it and allow the examiner to take a copy of it?

[*Objected to by Mr. Hill, as immaterial and irrelevant.*]

Ans. The clock was started to running about that time—within a day or two.

(Witness produces the following memorandum, a copy of which is introduced in evidence; the original to be produced when called for:

"PHILADELPHIA, *Nov.* 6th, 1876.

Mr. R. E. SHAPLEY,

To Booze & Thomas, Dr.,
No. 108 South Eighth Street, 2d floor.

Terms: Jno. A. Haddock, Pr. 104 & 106 S. Eighth St.

Piece Copper, $4 00.")

Q. 52. What was that piece of copper for?

Ans. An earth battery.

Q. 53. Who set up the clock and set it running, yourself or Mr. Drawbaugh?

Ans. Mr. Drawbaugh.

[*This whole line of questions about the clock, objected to by Mr. Hill, as immaterial and irrelevant.*]

Q. 54. How long did the clock run in your shop, and did you find it to be a good time-keeper or not?

[*Same objection.*]

Ans. I don't know the length of time, but it was quite a while; it was no time-piece.

Q. 55. Do you remember how much it would vary from day to day?

[*Same objection.*]

Ans. As much as fifteen minutes.

Q. 56. Did Mr. Drawbaugh ultimately take this clock away from your shop; and, if so, can you state when it was?

[*Same objection.*]

Ans. He did, but the time I do not know.

Q. 57. Did you, about the time or soon after you made this arrangement with Mr. Drawbaugh to be interested in the clock, construct one for yourself; and, if so, did he and you confer together about its construction, and did he do any part of the work, or was any part of it done at his shop?

[*Same objection.*]

Ans. Some time after that, one was constructed for myself. To the best of my knowledge he and I did not confer together about its construction. The gearing was cut at his shop, as he had my cutting engine there; but I am not positive whether the cutting was done at his shop or at mine; if they were cut at his place he done the cutting.

Q. 58. Did you make new plans for this clock, or did you follow the plans of the clock which he had brought to your shop, or some other clock of which he had constructed the plans?

[*Same objection.*]

Ans. The clock was not made after the one brought to my place. The clock was made just as clocks afterwards made by him are made, except that I put in an intermediate wheel to carry the second hand the right way: I mean that the principle was the same, but the ornamentation was different.

Q. 59. Do you mean that the working parts of your clock were like clocks which he afterwards constructed, with the exception above-mentioned?

[*Same objection.*]

Ans. Yes, sir.

Q. 60. Had you seen these subsequent clocks of his, or plans of the same, before you constructed your clock?

[*Same objection.*]

Ans. I do not remember of seeing any.

Q. 61. After you had completed your clock, was it set to running, and what was its character as a time-keeper?

[*Same objection.*]

Ans. It was set to running, but it was not satisfactory.

Q. 62. Was it run with the same earth battery that Drawbaugh's clock was?

[*Same objection.*]

Ans. It was.

Q. 63. Did you arrange that battery in the earth, or did Mr. Drawbaugh?

[*Same objection.*]

Ans. Mr. Drawbaugh.

Q. 64. I observe that the contract which you have produced provides that you shall pay the expenses of patenting the clock; did you, at any time after the contract was made, have anything to say to Mr. Drawbaugh about patenting it? If so, state what it was.

[*Same objection.*]

Ans. I can't just state the conversation that took place, but I told him a number of times that I was ready to have the thing patented.

Q. 65. Why was it not patented by you, or at your expense?

[*Same objection.*]

Ans. The principal cause assigned, was not having time to make the model.

Q. 66. Do you mean assigned by Mr. Drawbaugh?

[*Same objection.*]

Ans. Yes, sir.

Q. 67. Did you see other clocks at Mr. Drawbaugh's shop besides those you have spoken of as being there at your first visit, and if so, how many, and did you see work being done upon them, or did you see them running after they were completed?

[*Same objection.*]

Ans. I did see several other clocks; I saw them in different stages of construction; I saw them running, but am not positive that the cases were entirely finished.

Q. 68. Who worked on these clocks, Mr. Drawbaugh himself, or some other person?

[*Same objection.*]

Ans. I understood Mr. Drawbaugh that his nephew assisted him in making the cases.

Q. 69. Can you describe, generally, the appearance of these clocks, and the size of the cases?

[*Same objection.*]

Ans. One was a hanging clock. It might have been four feet in length. The other two were clocks that set on the floor; one may have been five, the other eight feet or more in height.

Q. 70. State whether or not there was any considerable amount of carved work on the cases of either of these clocks.

[*Same objection.*]

Ans. The larger clock was gotten up in good style—considerable work on the case.

Q. 71. Can you state generally how the working parts of the clocks you then saw at Drawbaugh's shop differed from the working parts of the clock you first saw at Drawbaugh's shop, if they did differ from it?

[*Same objection.*]

Ans. The escapement was the same; the hands were carried in the later clocks by a train of wheels; the pendulum, instead of being wood, was a compensating rod, or pendulum.

Q. 72. Before making his compensating pendulums did Mr. Drawbaugh make any inquiry of you about compensating pendulums; and if so, what was his inquiry, and what information did you give him about such pendulums, if any?

[*Same objection.*]

Ans. Mr. Drawbaugh and I had a talk on the matter, and I referred him to Horton's patent as being the easiest and cheapest made.

Q. 73. Did you show him any description or diagram of Horton's pendulum; and if so, in what work did you show it, and on what page?

[*Same objection.*]

Ans. I did; in the "*Watchmaker and Jeweler,*" published in New York, of September, 1870, page 28.

(Complainant's counsel offers the description and diagram of Horton's pendulum referred to, to be copied by the examiner upon the record, and to be marked "Exhibit Horton's Pendulum." For convenience in printing, said exhibit is shown in "Complainants' Book of Exhibits."

Objected to by Mr. Hill, as immaterial and irrelevant.)

Q. 74. Was there anything said between you about modifying this pendulum, so as to be different in any way from that shown in the diagram? And, if so, what was said?

[*Same objection.*]

Ans. I suggested to Mr. Drawbaugh that we use two compensating rods instead of one, for appearance—not for better results; and to use a set screw in moving the rod for adjusting.

Q. 75. Did you consider these changes as patentable improvements, or as mere mechanical modifications?

[*Same objection.*]

Ans. I did not consider it patentable, as it did not change the principle.

Q. 76. Do you know whether the compensating pendulums which Drawbaugh afterwards constructed, embrace these modifications?

[*Same objection.*]

Ans. Mr. Drawbaugh instead of using one steel rod used two, to part it, to allow space for the electro-magnet and permanent magnet. The permanent magnet was fastened to the pendulum, and the electro-magnet was fastened to the back of the clock. The two rods were to allow space for the beating of the pendulum. He had two brass rods and adjusting screws.

Q. 77. The use of two steel rods was not spoken of between you and Mr. Drawbaugh at the time you showed him the Horton diagram, I understand you?

[*Same objection.*]

Ans. It was not.

Q. 78. Do you remember at what time it was that you showed him the Horton diagram, or whether it was while he resided at Mechanicsburg?

[*Same objection.*]

Ans. I do not remember the time, but think it was while he resided at Mechanicsburg.

Q. 79. Do you remember showing Mr. Drawbaugh a copy of the *Scientific American* containing a description of the "Reis Telephone," so-called?

Ans. I remember of showing Mr. Drawbaugh a *Scientific American* containing a description of a telephone, but do not remember whether it was Reis'.

Q. 80. How came you to show it to him?

Ans. I was in the habit of showing him my *Scientific Americans.* My reason for calling his attention to that one was because I had seen a telephone at his place.

Q. 81. Were you in the habit of loaning him the *Scientific Americans* while he lived at Mechanicsburg, or did he come to your shop to read them?

Ans. He used to come to my shop to look at them, and if there was anything he wished he took them with him.

Q. 82. You have said that after you made the contract with him you spoke to him several times about patenting his clock. Did you, at that time, think the invention was a valuable one?

[*Objected to by Mr. Hill as immaterial and irrelevant.*]

Ans. I did.

Q. 83. Did you afterwards come to a different conclusion, and if so, what led you to it?

[*Same objection.*]

Ans. Bad results from my clock led me to it.

Q. 84. Did you, at any time after you made your contract with Mr. Drawbaugh, find any description of electric clocks? If so, in what publication?

[*Same objection.*]

Ans. I did. The Mechanicsburg Library Association contains a book containing a description of an electric clock. I am not certain about the name of the book, but think it was "Dictionary of Mechanics."

Q. 85. When did you find this description, and did you ever say anything to Mr. Drawbaugh about it?

[*Same objection.*]

Ans. I do not know how long afterwards I found it, nor do I remember what conversation I had with Mr. Drawbaugh, but I think I mentioned it to him.

Q. 86. Did you know of Mr. Drawbaugh, some time after your contract with him, having negotiations with the Messrs. Grissinger, and of their afterwards taking hold of the clock with him?

[*Same objection.*]

Ans. Only from report, I believe, having no conversation with Mr. Drawbaugh on the subject, to my recollection.

Q. 87. Why did you not have conversation with him about it, or object to his making a trade with other parties after his contract with you?

[*Same objection.*]

Ans. Finding that my clock was unsatisfactory I did not care.

Q. 88. Do you remember when you last visited Mr. Drawbaugh's shop how you came to go there, and how long you were there?

Ans. The last visit I made to Mr. Drawbaugh's shop was, I think, on the fourth of July, 1878. My brother and family, and myself and family, went fishing. I was not very much in the shop. I was in several times, but the length of time I don't remember. My brother was making a hammer, and wished to get it turned, and got Mr. Drawbaugh to turn it. That was more particularly why I selected that place for fishing.

Q. 89. Referring again to the clock which you saw on your first visit to Mr. Drawbaugh's shop, and which was run by an earth battery, what, in your judgment, would it have cost to construct that clock, including such case as there was when it was brought to your shop, and allowing a fair estimate for the labor?

[*Objected to by Mr. Hill as immaterial and irrevelant.*]

Ans. I can hardly tell; the case was not finished. It was made as such things are generally made; there was not a great deal of finish put on the case; I suppose it would have cost twenty or twenty-five dollars, or perhaps more; I refer to the case and works.

Q. 90. What, in your judgment, would it have cost to construct the clock, including case and works that you subsequently saw there, and referred to as a hanging clock about four or five feet long?

[*Same objection.*]

Ans. I could not say; I never seen the clock completed, that is, the case.

Q. 91. Can you give any estimate of the cost of it in the condition in which you saw it?

[*Same objection.*]

Ans. Not less than twenty dollars.

Q. 92. What, in your judgment, would have been the cost of the large clock which you spoke of, eight or nine feet high?

[*Same objection.*]

Ans. I do not think it could have been put up for a hundred dollars.

Q. 93. Can you give an estimate of the other clock you referred to, a smaller one, made to stand on the floor?

[*Same objection.*]

Ans. I do not think it could have been put up for seventy-five dollars.

Q. 94. You have said that your last visit to Mr. Drawbaugh's shop was made July 4, 1878; can you tell how long before that it was since you had been at his shop?

Ans. I cannot.

Cross-examined by Mr. Hill.

Cross-Q. 95. You say your business is jeweler and repairing of watches; do you keep clocks for sale and repair them also?

Ans. Yes, sir.

Cross-Q. 96. Was your business in 1876 the same as it is now?

Ans. Yes, sir; it was.

Cross-Q. 97. How do you fix the time of your first visit to Mr. Drawbaugh's shop as October?

Ans. It was some four or five weeks prior to his agreement with me.

Cross-Q. 98. You mean the agreement of November 8, do you?

Ans. Yes, sir.

Cross-Q. 99. Can you swear positively that it was as much as two weeks prior to that agreement?

Ans. Yes, sir.

Cross-Q. 100. Can you swear postively that it was not as much as two months prior to that agreement?

Ans. I think I can.

Cross-Q. 101. Can you swear positively that that visit to his shop was not made before the first day of October, 1876?

Ans. My reason for it is, that my brother-in-law was with me on the first visit, he visiting me on Monday, October the second. Tuesday, October the third, I think it was, when we went to Mr. Drawbaugh's shop for the first time.

Cross-Q. 102. How soon were you at Mr. Drawbaugh's shop again after October third, 1876?

Ans. I could not say, having nothing to fix dates.

Cross-Q. 103. Was your second visit prior to the eighth of November, 1876, the date of the contract;

Ans. I am not positive; I think I was there between those dates.

Cross-Q. 104. How many times were you at Mr. Drawbaugh's shop between the third day of October, 1876, and the fourth day of July, 1878?

Ans. I could not say.

Cross-Q. 105. Approximate it as nearly as you can.

Ans. It may have been five, six, or more times; I don't know whether it was that many or not; I was there a number of times.

Cross-Q. 106. Fix the time as nearly as you can when you made up your mind that it was not worth while to go on with the clock matter, and ceased to take further personal interest in it.

Ans. I could not say; it may have been six or eight months, or more; it was after making my clock.

Cross-Q. 107. Was it while Drawbaugh still lived at Mechanicsburg?

Ans. I could not say.

Cross-Q. 108. After you made up your mind to go no further in the clock matter, did you visit his shop again at any time before July 4, 1878?

Ans. I am not positive, but think I did.

Cross-Q. 109. Have you any idea how many times, or for what purpose?

Ans. I do not remember the times. I had nothing in particular in view.

Cross-Q. 110. How came you to lend Drawbaugh the twenty dollars on the 8th of November, 1876?

Ans. He asked me for more, and I told him that was all I could spare him at that time, as I was just going to visit the Centennial that morning.

Cross-Q. 111. What reason did he give for wanting money at that time?

Ans. He wanted to pay a bill of some kind.

Cross-Q. 112. How long were you at the Centennial?

Ans. I think I was gone from home but three days.

Cross-Q. 113. Did you see any telephones there?

Ans. I do not remember of seeing any.

Cross-Q. 114. Referring to the note for twenty dollars which Mr. Drawbaugh gave you November 8, 1876, have you, within the last two years and a half, called his attention to it, or requested payment or a settlement of the account?

Ans. I do not remember of ever asking him.

Cross-Q. 115. You have in direct examination given estimates of the cost of various electric clocks which you saw, finished or unfinished, at Mr. Drawbaugh's shop; was that estimate based upon the cost of the raw materials alone, or upon both materials and labor?

Ans. Both material and labor.

Cross-Q. 116. Do you know whether the raw materials in those clocks were purchased by Mr. Drawbaugh himself with his own money, or whether they were purchased with money furnished by other parties, who were, or expected to become, interested in the electric clock invention?

Ans. I do not know where the money came from.

Cross-Q. 117. How long did it take you to make the electric clock which you say you made at Mechanicsburg?

Ans. I do not know; I made it between times in my work.

Cross-Q. 118. When you showed Mr. Drawbaugh the article in the *Scientific American* containing a description of a telephone, do you remember whether he read it, and what he said about it?

Ans. I do not think that he read it aloud; he said he would take the paper with him.

Cross-Q. 119. Did he ever refer to it afterwards? If so, what did he say?

Ans. I do not remember that he ever referred to it, having never returned the paper, to the best of my knowledge.

Cross-Q. 120. Do you remember who was the author of that article?

Ans. I do not.

Cross-Q. 121. Did it refer to Dr. Vanderweyde's lecture in New York on the subject?

Ans. I do not know, having never read the article since.

Cross-Q. 122. Had you ever read or heard anything about the telephone before reading that article, excepting what Mr. Drawbaugh had told you on the 3d of October, 1876?

[*Complainant's counsel objects to the question because it implies that the witness had not read the article before he had any communication with Mr. Drawbaugh on the telephone, nothing having yet appeared in evidence to justify the implication.*]

Ans. I do not remember.

Cross-Q. 123. Have you any recollection of ever having heard or read of a telephone before the 3d of October, 1876?

Ans. I don't know of any other than this article that I have reference to, and do not know that I had read that fully.

Cross-Q. 124. Did you show that article to Drawbaugh before or after the 3d of October, 1876, and if after, how long after, to the best of your recollection?

Ans. I do not know how long after, but it was after.

Cross-Q. 125. When you showed Drawbaugh the article about the telephone in the *Scientific American*, was the paper a new number or an old number? I mean was it a number that you had recently received or an old number?

Ans. I think it was a number that I had received some time before that.

Cross-Q. 126. Had you received it before the 3d day of October, 1876, or not until after that date?

Ans. Before.

Cross-Q. 127. How do you remember that fact?

Ans. I kept my *Scientific Americans* at the end of my counter and frequently referred to them. I think it was in a March number of 1876.

(Recess for dinner, until 2.30, P. M.)

NOVEMBER 22, 1882, 2.30, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Cross-examination of Rufus E. Shapley, by Mr. Hill, continued.

Cross-Q. 128. Please look at the instruments now shown you marked "G," "H," "J," "K," "L," "M," "N," "O," "P," "Q," and state whether you have any recollection of ever having seen any of them at Mr. Drawbaugh's shop at any time; if so, which one?

Ans. I have no recollection whatever of seeing any one of them.

Cross-Q. 129. When you began to lose interest in the electric clock business, did Mr. Drawbaugh find some fault with you for not going on with the business; or did any feeling grow out of the matter between you and him?

Ans. We never conversed on the subject to my knowledge; and as far as I am concerned there is no bad feeling between us, and none that I know of on his part.

Cross-Q. 130. When and by whom were you first spoken to on behalf of the Bell Telephone Company in regard to the matters about which you have testified in this case?

Ans. I could not say. There was a gentleman—I would know him if I would see him—who was in my place and asked me a number of questions. I did not know and do not know now that he was in the interest of the Bell Telephone Company. I do not know his name; I believe he did not give me his name. I could not give any date.

Cross-Q. 131. Was it one or two years ago?

Ans. It may have been; I am not positive; it was quite a while.

Cross-Q. 132. Referring to the electric clock which you had at Mechanicsburg in your store, did you, while it was there, tell Mr. Drawbaugh that by altering the adjustment, or adjusting it, it was now keeping time correct within about a variation of a minute or less per day? I mean either clock that you had in your store.

Ans. I do not remember of telling Mr. Drawbaugh that its variation was within a minute or less. Its variation was greater some days than others.

Cross-Q. 133. In your answer 31 you refer to an instrument with a knob on the end of a magnet which he rocked. Was that knob on the end of a rocking magnet, or was it on the end of a rocking key, something like a telegraph key?

Ans. I think it was on the end of a magnet.

Cross-Q. 134. You wouldn't swear to that positively, would you?

Ans. I think I can.

Cross-Q. 135. On that first visit of yours to Drawbaugh's shop, October third, 1876, you went from Mechanicsburg to White Hill Station by rail, and returned from White Hill station to Mechanicsburg in the same way, did you not?

Ans. Yes, sir.

Cross-Q. 136. By a passenger train?

Ans. Yes, sir.

Cross-Q. 137. At what hour did you leave Mechanicsburg for White Hill station and at what hour did you leave White Hill station for Mechanicsburg on the return trip?

Ans. I think that we left Mechanicsburg at one-thirty and returned at five. I am not positive that it was just that, but about that.

Cross-Q. 138. Was it the regular passenger train, or a special train either way?

Ans. The regular.

Cross-Q. 139. Did you walk or ride from White Hill station to Drawbaugh's shop and back?

Ans. We went afoot, but it was a very fast walk—as fast as we could go, for we wanted to make time.

Cross-Q. 140. In your answers 72 to 78 inclusive you refer to Drawbaugh's compensating pendulum; you say that before he made his compensating pendulum you and he had a talk, and you referred him to Horton's patent, it being the easiest and cheapest made, etc., do you remember all that talk pretty clearly?

Ans. I do not remember all that talk; Mr. Drawbaugh and I talked on the subject; I referred him to the "*Watchmaker and Jeweler,*" to the cut represented in September, 1870.

Cross-Q. 141. He introduced the subject of compensating pendulums, did he not?

Ans. I think he did.

Cross-Q. 142. Did he not, before you referred him to the "*Watchmaker and Jeweler,*" state that he had contrived a compensating pendulum, and endeavor to give you an idea of what his contrivance was?

Ans. I do not remember that he did.

Cross-Q. 143. Will you swear that he did not?

Ans. I will not.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 22d day of November, 1882. FRED. M. OTT, *Examiner.*	R. E. SHAPLEY.

ISAAC D. LANDIS, *being produced, sworn and examined, saith:*

Examined by Mr. Smith:

Q. 1. Where do you reside, and what is your occupation?

Ans. My residence is Coatesville, Pennsylvania, and my occupation watch-maker and jeweler. My age is forty-one.

Q. 2. Where did you reside in 1876, and what was your occupation at that time?

Ans. Both the same.

Q. 3. Are you a relative of R. E. Shapley, of Mechanicsburg? If so, what is the relationship?

Ans. I am a brother-in-law.

Q. 4. Do you remember making him a visit in the fall of that year, and if so, can you fix the time when you reached his house and when you returned home?

Ans. I remember making him a visit in the fall of that year. I reached his house on or about the second day of October, 1876, and returned home on or about the sixteenth of the same month.

Q. 5. On what day did you leave home, and did you go to any other place before you went to Mr. Shapley's?

Ans. I left home on Saturday, September 30, and went to Duncannon, Pennsylvania.

Q. 6. On what day did you go from Duncannon to Mechanicsburg?

Ans. To the best of my belief, on Monday following, the second day of October.

Q. 7. Have you been able, by referring to your books kept at your store, to fix the date when you left and the time of your return? If so, state in what way you fix those dates.

Ans. By the entries being made in my cash-book by my brother, who was assisting me at that time temporarily.

Q. 8. Was he in charge of the store while you were away?

Ans. He was assisted by my father part of the time.

Q. 9. If you have the book with you to which you refer to fix these dates, will you produce it to be examined by the counsel for the respondent, if he desire?

Ans. I have, and will produce it.

[*Witness produces book.*]

Q. 10. Will you state what the last entry is, made by yourself before the entries made by your brother, and what was the first entry made by yourself after the entries made by your brother, and after your return?

Ans. The last entry in my hand-writing was on Saturday night, September 30, footing up the amount of the day. I wrote the heading for Monday, October 2. The first entry on my return, in my handwriting, is on Monday, the 16th of October.

Q. 11. Do you remember that you went to Duncannon and spent Sunday?

Ans. I do.

Q. 12. After you reached Mechanicsburg did you go with Mr. Shapley to visit the shop of Daniel Drawbaugh, at Eberly's Mills?

Ans. I did.

Q. 13. How soon after you reached Mechanicsburg did you make that trip?

Ans. To the best of my belief it was the day after arriving there—Tuesday, October 3.

Q. 14. How came you to go with Mr. Shapley to Mr. Drawbaugh's shop?

Ans. Through the solicitation of Mr. Shapley.

Q. 15. Did he state what his object was in making the visit? If so, what was it?

Ans. To see a magnetic or electric clock made by Mr. Drawbaugh.

Q. 16. Do you remember what time of day you left Mechanicsburg to go there, and what time you returned?

Ans. We left Mechanicsburg shortly after dinner, and returned in time for supper.

Q. 17. Had you ever been to Mr. Drawbaugh's shop or seen him before that time, or have you ever been there since?

Ans. I had never been to his shop before; have no recollection of ever meeting him before; and have not been there since.

Q. 18. How long, according to your recollection, did you stay at the shop?

Ans. Something over an hour; I can't give the exact time: perhaps an hour and a half.

Q. 19. Did you see the clock which Mr. Shapley went to see, and did Mr. Drawbaugh show it to you?

Ans. I did, and Mr. Drawbaugh explained the working of it.

Q. 20. Do you remember whether or not he explained its being run by an earth battery?

Ans. Yes, sir; he did.

Q. 21. Will you describe briefly the appearance of the clock—what kind of hands and face it had, and the case?

Ans. The case was after the style of the ordinary English clocks, as they are called. It had two doors, one in the lower part, or waist of the clock, the other opening to the dial, with some ornamentation; dial round and made of paper, I believe; I cannot describe the hands.

Q. 22. Did you see two other clocks there which were connected electrically, so that one governed or propelled the other?

Ans. Yes, sir.

Q. 23. State whether or not Mr. Drawbaugh showed you any other machines or devices which he had there, and how he came to show them to you.

Ans. He took us through his work-shops, or shop, and showed us his apparatus for electric bells, also an insulator, and an electric fire alarm, and an electric alphabetical apparatus, his lathes, and a machine for grinding tighteners for his patent axles that he had, and an instrument for speaking through, called a telephone.

Q. 24. How did he come to show you these things? Did you ask him to show you what he had in the shop, or did he invite you, unasked?

Ans. Through courtesy, of his own accord, he took us through the place.

Q. 25. You mentioned an insulator as one of the things he showed you? Was that a machine for insulating wire by covering it with thread?

Ans. Yes, sir.

Q. 26. You mentioned, also, an alphabetical apparatus. Did you understand that to be some kind of telegraphic instrument?

Ans. Yes, sir.

Q. 27. On what floor were these various things which you have spoken of?

Ans. On the second floor, I presume you would call it.

Q. 28. Will you describe, as well as you are able, the telephone which he showed you? State where it was, and what Mr. Drawbaugh said with relation to it.

Ans. It was in a room to the left on entering his place by the stairway, nearly opposite the door going into the room. My recollection of it is, as being made of tin—apparently a tin can—with a piece of bladder across the end of it, with a magnet attached to it in front of the bladder; and, also, that he said, in calling our attention to it, that this was to revolutionize the world, or words to that effect; that it was for the purpose of speaking through—carrying the sound of the voice.

Q. 29. Was that instrument connected in any way with any other instrument so far as you could see, or with the building?

Ans. No, sir; it was not in working order at the time.

Q. 30. Did he show you any other instrument which he called a telephone or which was to be used as a speaking instrument?

Ans. No, sir.

Q. 31. Will you look at the various instruments now on the table marked respectively "A," "B," "C," "C Reproduced," "D," "E," "F," and "I," and state whether you find among them the instrument which Mr. Drawbaugh showed you, and whether you saw on that occasion any of the other instruments?

Ans. I identify this instrument, (marked "B,") which is the only instrument I saw on that visit to the best of my knowledge.

Cross-examined by Mr. Hill.

Cross-Q. 32. Do you recollect all the conversation with Mr. Drawbaugh with regard to his telephone at that time?

Ans. This is all I remember specially.

Cross-Q. 33. Your examination of those machines, except the clock, was somewhat rapid and hurried, I suppose?

Ans. Not necessarily; we had ample time to look around.

Cross-Q. 34. Mr. Shapley testified that Mr. Drawbaugh said that they had talked through the telephone machine which he showed you; do you remember that?

Ans. He didn't while I was there—not in my presence.

Cross-Q. 35. How are you able to make oath to that, if you don't remember all the conversation? Can you swear to anything more than that you do not recollect of Mr. Drawbaugh's saying that?

Ans. I would very distinctly remember if I had heard any person speak through it.

(*Mr. Hill suggests that the witness must have misunderstood the question. Witness continues:*)

I understood you to say that Mr. Shapley testified that there was talking done through the instrument in our presence.

Cross-Q. 36. No, you misunderstood me; I will make my question plainer. Mr. Shapley in his 28th answer used these words, to wit: "I think I understood Mr. Drawbaugh to say that they had spoken with it;" I meant to ask you if you remembered Mr. Drawbaugh's saying that?

Ans. I do not remember; he may have said it to Mr. Shapley who paid closer attention to the details of the several instruments shown

Cross-Q. 37. Do you remember whether Mr. Drawbaugh said how far they could talk through this instrument?

Ans. No, sir.

Cross-Q. 38. Do you remember whether he expressed the opinion that it would take the place of the telegraph wholly or partially?

Ans. Yes, sir; that was the impression conveyed to my mind.

Cross-Q. 39. Did you understand the instrument to operate by electricity?

Ans. I cannot say as to that.

Cross-Q. 40. Did it have a magnet on it wound with insulated wire?

Ans. That is my recollection of it.

Cross-Q. 41. Did he explain why it was out of working order at that time?

Ans. Not to my knowledge.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 22d day of November, 1882.
FRED. M. OTT.

I. D. LANDIS.

Adjourned until November 23d, 1882, at ten, A. M.

NOVEMBER 23, 1882, 10, A. M.

Adjourned until November 24th, at ten, A. M.

NOVEMBER 24, 1882, 10, A. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

JOHN S. FOOSE, *being produced, sworn, and examined, saith:*

Examined by Mr. Storrow:

Q. 1. What is your age, residence, and occupation?

Ans. My age is sixty-five. Residence, Duncannon, Perry county, Penna., on the Susquehanna river, about fifteen miles above Harrisburg. My occupation is constable at present.

Q. 2. How far is Duncannon above that part of Marysville which is called Haley's?

Ans. They call it seven miles to Marysville, and I suppose it means the same thing.

Q. 3. Did you ever open a coal mine on Cove mountain, between Duncannon and Marysville?

Ans. I explored for coal—put in shafts.

Q. 4. Will you produce the mining lease under which you made those explorations?

Ans. Yes, sir; here it is.

[The paper referred to is an indenture, dated October 29, 1875, whereby James Bell and L. C. Zimmerman, of Rye township, Perry county, leased to John S. Foose and Henry M. Sweger the mines of coal, iron, and other minerals on certain described tracts of land in the townships of Rye and Penn on a royalty. The lease is a mining lease for ninety-nine years, with a proviso that the lessees be allowed three years to explore the lands to discover coal, iron, or other minerals; and if within that time they do not discover them, and afterwards work them to their fullest capacity, the lease to be void.]

Q. 5. Did you have any other partner in the business under that lease besides Mr. Sweger; and, if so, whom?

Ans. Yes, sir; William Fields, of Harrisburg.

Q. 6. Have you here an account-book which contains the time and pay of the men who worked for you and your partners under that lease; and, if so, will you please produce it?

Ans. Yes, sir; this is the book.

Q. 7. In whose handwriting is it?

Ans. It is in my handwriting.

Q. 8. It seems to contain various entries of work and of payments under certain dates; were, or were not, those entries made by you at the time of those dates, and while the work was going on?

Ans. Yes, sir.

[The book is entitled on the first blank leaf as follows: "Duncannon, November 20, 1875. Accounts of the coal mines of J. S. Foose, Sweger, and Fields at the Cove mountain." The account of each man is kept separate, with a credit to him on one side of the number of days worked, and charges on the other side, under a regular series of dates, of cash paid, and articles furnished.]

Q. 9. I observe that the first man whose name appears in the book is "Larance Baker": did he work for you in opening for coal on that land?

Ans. Yes, sir.

Q. 10. The first entry under his name is under date of November 20, 1875, "by three and a half days, $5 25;" was that the time when you and your partners began explorations on that land under that lease?

Ans. Yes, sir.

Q. 11. His account seems to run along with entries every week, or almost every week, until December 22d, 1876, when it is added up, and the credit to him for labor amounts to $422 25; did you and your partners prosecute the work pretty steadily on that land during that period between those dates, that is, between the middle of November, 1875, and the last of December, 1876?

Ans. Yes, sir; we did.

Q. 12. What were Baker's wages per day?

Ans. A dollar and a half.

Q. 13. I find in the same book that you were credited for time nearly every week from November, 1875, to September, 1876; were you attending to the work pretty steadily during that period?

Ans. Yes, sir; I did, as the charges are entered on the book.

Q. 14. I find that "Sam Foose" is credited for work nearly every week, at the rate of a dollar and a quarter a day, from November 20th, 1875, to December 22d, 1876, the total credit being $352 81; was, or was not, that for work on that land under that lease?

Ans. Yes, sir.

Q. 15. What relation of yours is Sam Foose?

Ans. A son of mine.

Q. 16. I find that John Metz is credited in that book at the rate of a dollar and a quarter a day nearly every week from July 15th to December 22d, 1876, the whole amounting to $124 37; is that for work done on that land under that lease?

Ans. Yes, sir.

Q. 17. Have you here present an account-book of the expenses of yourself and partners, other than for labor, on that coal mine under that lease. If so, will you please produce it, and state whether or not it is in your handwriting?

Ans. Yes, sir; this is the book, and it is in my handwriting.

Q. 18. Were the entries therein made by you at or about the dates that are given for each, and while the work was going on?

Ans. Yes, sir.

[The book is headed "1875. Foose, Sweger & Fields. Expenses at coal mines." It begins with an account of expenses for powder, tools, &c. The first date of that account is November 29, 1875, and the last is December 30, 1876. This account amounts to $294 24.]

Q. 19. The first book that you produced containing the accounts of the men shows that the only work done by Baker after December 22, 1876, was two days' work in December, 1877, and about a month's work in the spring of 1878; and that the only work done by Sam Foose, after December 22, 1876, was two days' work in the spring of 1878; did you and your partners stop work on that land at the end of 1876, with the exception of this little work done in 1878, just referred to?

Ans. Yes, sir.

Q. 20. Has any work been done on that land in the way of digging for coal since 1876, except this little work in 1878 referred to?

Ans. No, sir; not in that firm.

Q. 21. If you or anybody else have done any working for coal on that land since then, will you state when it has been done, and how recently?

Ans. There has none been done, except that we put men to work last Monday again, but that is under a new lease.

Q. 22. What was the work that you and your partners had done on that Bell & Zimmerman land under that lease between the middle of November, 1875, and the last of December, 1876?

Ans. We run a tunnel into the mountain in that time.

Q. 23. Did you drive that tunnel from the surface or from the bottom of a shaft?

Ans. We drove it from the surface.

Q. 24. How long was that tunnel, about?

Ans. About two hundred and sixty feet.

Q. 25. Was it timbered?

Ans. It was timbered from the mouth till we struck the solid rock, and then it wasn't timbered. About thirty feet, I suppose, was timbered.

Q. 26. Did you sink any shafts on that land during that lease?

Ans. Yes, sir.

Q. 27. What was the principal part of the work done on that land, sinking the shafts or driving the tunnel?

Ans. Driving the tunnel.

Q. 28. Has any coal ever been shipped to market from that land?

Ans. No, sir.

Q. 29. Do you know a piece of land belonging to one Kirby on Cove mountain, a mile or two down the river from the Bell & Zimmerman land which you have testified about?

Ans. Yes, sir; I know the land, but from the line of Bell & Zimmerman's land it is not over a mile.

Q. 30. Did you ever make any openings to explore for coal on that Kirby land?

Ans. Yes, sir; I sunk a shaft.

Q. 31. Have you here a book containing any account of any work that you did, or time that you spent, yourself, in making this opening on the Kirby land. If so, will you please produce it, and point out the entries, and state in whose handwriting they are?

Ans. Here is the book, and it is in my own handwriting, done at the time. These are entries of some work I did myself.

[The entries referred to are headed "1877. William Kirby, Dr. to J. S. Foose," and are for fourteen days' work, the first date being June 6, 1877, and the last being July 14, 1877.]

Q. 32. Did you have any men working at those openings at that time; and, if so, whom?

Ans. Lawrence Baker, Jacob Myers, Samuel Foose.

Q. 33. Who paid those men, you or Mr. Kirby?

Ans. Kirby paid the men.

Q. 34. About how long did the men work on that Kirby land?

Ans. They worked about three weeks to the best of my recollection.

Q. What was the work they did?

Ans. Sinking a shaft down. First, they dug a couple of small holes just to find a place to locate the shaft, and then they sunk one principal shaft down.

Q. 36. About how deep was that shaft?

Ans. About thirty feet.

Q. 37. Did you find coal there?

Ans. Yes, sir; we found some coal there.

Q. 38. Has any coal ever been shipped to market from that Kirby land?

Ans. No, sir; none that I know of.

Q. 39. Had there been any shafts sunk on the Kirby land before you sunk this shaft in 1877?

Ans. Not that I know of.

Q. 40. Have there been any coal mines opened on Cove mountain, except what you have opened?

Ans. Not that I know of.

Q. 41. Did the work that you did at these openings attract much attention in the neighborhood?

Ans. It did some, but not very much.

Q. 42. Did any geologists ever come to see it?

Ans. Yes, sir; I know of one.

Q. 43. Was he employed by you, or was he attracted to come and see it?

Ans. The Duncannon Iron Company brought him; Harvey Fisher brought him there.

Q. 44. Do you know an old fertilizer-mill where they ground bone, which stood on the river road between Marysville and Duncannon and not a great ways above Marysville?

Ans. Yes, sir.

Q. 45. About how far is that mill from Haley's?

Ans. About two miles.

Q. 46. Were they running that mill in 1877 while you were working on the Kirby land?

Ans. Yes, sir; part of the time only.

Q. 47. How far from that fertilizer-mill was the Kirby land, and in what direction?

Ans. About a short half mile in a south or south-east direction.

Q. 48. How do you go to get up to that opening on the Kirby land from the river road?

Ans. If you want to go with a horse and buggy, or anything, there is a road on to the Kirby land, a little above the fertilizer-mill, but you can't get up on to the mountain to where we was digging unless you walk up.

Q. 49. If you want to walk up from the river road, where do you turn off to go to the place where you were digging?

Ans. Right there at the fertilizer-mill or bone-mill, as we call it; that is the nearest way to get up afoot.

Q. 50. How do you get from the river road up to the Bell and Zimmerman land where you drove the tunnel?

Ans. There is a road that crosses the main road after you leave Cove station a short mile. There is a by-road that runs between Zimmerman and Collier into the public road that crosses the mountain into Fishing Creek Valley, and that runs close by where we were digging on the mountain, within a hundred or a hundred and fifty yards.

Q. 51. How far is it from the bone-mill to the place where this cross-road turns off from the river road to go to Bell and Zimmerman's?

Ans. About a mile and a half.

Q. 52. Which is the nearest to Marysville, the bone-mill or the place where the cross-road turns off?

Ans. The bone-mill is the nearest.

Q. 53. It appears from the indenture that you took an exploring lease of the Bell and Zimmerman land October 29, 1875; had you before that made any tests on the mountain which made you think it worth while to take an exploring lease?

Ans. Yes, sir.

Q. 54. When you first made that test on the mountain, what kind of mineral were you searching for?

Ans. I was searching for iron ore in the first place there.

Cross-examined by Mr. Hill:

Cross-Q. 55. When you took the mining lease October 29, 1875, was your main object the mining of coal?

Ans. Yes, sir.

Cross-Q. 56. How long before the date of that lease did you first commence to do any work on that mountain in the way of mining or exploring for any mineral substance?

Ans. I can't recollect exactly, but it was over a year before that.

Cross-Q. 57. Was it in the spring, summer or fall when you began?

Ans. I think it was in the spring.

Cross-Q. 58. Whose land did you make your explorations on before you took the lease?

Ans. On the land of Bell and Zimmerman.

Cross-Q. 59. Who did the work in those explorations before the lease?

Ans. Baker and Myers' boys, and Metz; I can't exactly tell you right, but that was the party that worked for me. I did not keep a correct account of it while I was working by myself; I paid the men and kept no account of it.

Cross-Q. 60. Who was Baker, and where did he live?

Ans. He lived in Rye township, Fishing Creek valley, close to the mountain where we worked; his name is Lawrence Baker.

Cross-Q. 61. Who were Myers' boys, and where did they live?

Ans. They lived close neighbors to Baker; I can't give their names, I just paid them, still, and don't think I took their names; there were two of them, sons of Jacob Myers; the old man worked for me in the tunnel, and they lived all together.

Cross-Q. 62. While giving your last answer you mentioned, conversationally, a third Myers boy; did he do any work for you?

Ans. I had no third; there was two only; one started to go to Harrisburg one day and got under the cars and got his leg cut off, and he didn't work for me after that; there was only two worked for me.

Cross-Q. 63. Who was Metz, and where did he live?

Ans. He lived in Fishing Creek valley not far from Baker. I don't mind that Metz worked for me before I had the lease; I am not certain.

Cross-Q. 64. Have you mentioned all the persons who worked for you on that mountain before you had the lease?

Ans. To the best of my knowledge I did; I don't remember any other.

Cross-Q. 65. Did you work yourself?

Ans. Yes, sir; part of the time I did.

Cross Q. 66. Where do those four persons, Baker, the two Myers' boys, and Metz now live?

Ans. They all live there at the mountain—on the south side of the mountain.

Cross-Q. 67. Before you had the lease, was the work done at different places on the mountain or only at one place?

Ans. At different places.

Cross-Q. 68. How many and where?

Ans. We sunk some small shafts on the south side of the mountain and some on the north side, and then the principal shaft that we sunk down was right on top of the mountain.

Cross-Q. 69. How far were those shafts apart?

Ans. I couldn't tell exactly, about a hundred yards or two hundred yards apart.

Cross-Q. 70. How far were they from the shaft or tunnel which you opened after you had the lease?

Ans. From the tunnel, I suppose in the neighborhood of a couple of hundred yards. I couldn't tell; may be a little more.

Cross-Q. 71. How deep was the principal shaft on top of the mountain?

Ans. I can't recollect exactly; it was about thirty feet I suppose.

Cross-Q. 72. Did you find any iron?

Ans. We found some specimens of iron.

Cross-Q. 73. Did you find any coal?

Ans. We found some coal, too, in small veins.

Cross-Q. 74. Did you find the iron or coal first?

Ans. We found the symptoms of coal first.

Cross-Q. 75. How near to that place were the nearest coal mines that were worked by anybody that you knew of?

Ans. The nearest I know were at Lykens Valley; that is about forty miles I suppose—about thirty or forty; I can't tell just the places.

Cross-Q. 76. Before you struck the coal or indications of coal on Cove mountain had it been understood or suspected that there was coal in that mountain so far as you know?

Ans. So far as I know I suspected coal there.

Cross-Q. 77. I mean, had there been any talk in the community about there being coal there?

Ans. The principal part of the talk in the community was, some said there was no coal there and some said there might be coal there.

Cross-Q. 78. When you struck the signs of coal there I suppose it made considerable talk in the community, did it not?

Ans. It made some, but some wouldn't believe in it at all; some had a little faith in it.

Cross-Q. 79. What was the nearest village to the place where you were exploring on the top of the mountain, and how far away was it?

Ans. I suppose Duncannon was the nearest, about three miles and a half away from it.

Cross-Q. 80. How far was Marysville away from it?

Ans. Something like four miles or a little over. You can hardly tell which would be the nearest, Marysville or Duncannon.

Cross-Q. 81. Marysville was east of it, and Duncannon west ?

Ans. Yes, sir.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 24th day of November, 1882.
FRED. M. OTT,
Examiner.

JOHN S. FOOSE.

SAMUEL A. FOOSE, *being produced, sworn, and examined, saith:*

Examined by Mr. Storrow:

Q. 1. What is your age, residence, and occupation ?

Ans. I am twenty-seven. Residence, Duncannon. Occupation, keeping a hotel at Duncannon.

Q. 2. Are you a son of Mr. John S. Foose, who has just testified?

Ans. Yes, sir.

Q. 3. It appears from the account-book which your father produced that you worked for him on the coal lands which he and his partners had leased from Bell & Zimmerman on Cove mountain; do you remember working there?

Ans. Yes, sir.

Q. 4. It appears from the same books that you worked pretty steadily from the middle of November, 1875, to the end of December, 1876, and did not work there afterwards, except a couple of days in 1878; is that according to your recollection ?

Ans. Yes, sir.

Q. 5. It appears from the same book that Lawrence Baker worked there with you about all that time, and Metz worked there with you about the latter half of that time; is that according to your recollection ?

Ans. Yes, sir.

Q. 6. Please state generally what was the work that you and Baker and Metz did for your father and his partners on that land under that lease.

Ans. We tunneled for coal.

Q. 7. How much of a tunnel did you make?

Ans. About in the neighborhood of two hundred and fifty feet in length.

Q. 8. Did you sink any shafts for your father and his partners under that lease?

Ans. Not to my recollection.

Q. 9. Was any coal shipped to market from that Bell & Zimmerman land?

Ans. No.

Q. 10. Did you, after you had stopped working on the Bell & Zimmerman land, do any work for your father and Kirby on Kirby's land in the way of opening for coal?

Ans. Yes, sir.

Q. 11. What was the work you did on Kirby's land?

Ans. Shafting. We sunk a shaft up there.

Q. 12. How much of a shaft was it—how deep?

Ans. Twenty or twenty-five feet, as near as I can recollect.

Q. 13. Did you find any coal there, and get out any?

Ans. Yes, sir.

Q. 14. Was any coal ever shipped from there?

Ans. No, sir.

Q. 15. How was this Kirby land situated with reference to the old bone-mill or fertilizer-mill, and how do you get to it from the bone-mill?

Ans. It is about straight up the mountain from the mill. You can go up by old sled-roads—to sled out wood from the mountain.

Q. 16. Your father's account states that the work on the Kirby land was done in the summer of 1877: is that according to your recollection?

Ans. Yes, sir.

Q. 17. How do you go from the river road to the Bell & Zimmerman land?

Ans. By the public road across the mountain.

Q. 18. About how far is it from the bone-mill to where the public road turns off from the river road to go up to the Bell & Zimmerman land?

Ans. About two miles or a little more than that.

Q. 19. Did you do any work on the Bell & Zimmerman land, testing for your father, before he and his partners took their lease; and, if so, what was it?

Ans. It appears to me I did work a couple of days.

Q. 20. Did any of the work done on the Bell & Zimmerman land attract attention around that part of the country; and, if so, what part of the work attracted attention?

Ans. The tunnel part attracted the big attention of the people—more so than any other.

Recess for dinner, until half past two o'clock, P. M.

NOVEMBER 24th, 1882, 2.30, P. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Q. 21. Who worked with you in the summer of 1877 on the Kirby lot?

Ans. Lawrence Baker and Jacob Weaver. I know they did, but whether Metz did I can't remember right.

Cross-examined by Mr. Hill.

Cross-Q. 22. If I understand you, you worked two days on the mountain before your father and his associates took the lease from Bell & Zimmerman; am I correct?

Ans. I believe that question was asked me this morning, and I misunderstood the question then. I said two days, but I worked two days at the tunnel before he got the lease, but I had done considerable work before that in the two shafts that were run.

Cross-Q. 23. Do you refer to the tunnel which you have testified was about two hundred and fifty feet long?

Ans. Yes, sir.

Cross-Q. 24. How far was that tunnel from the foot of the mountain?

Ans. A good quarter of a mile.

Cross-Q. 25. How far was it from the top of the mountain?

Ans. Not very much further.

Cross-Q. 26. You worked on Kirby's land also, did you?

Ans. Yes, sir.

Cross-Q. 27. What did you do there?

Ans. I shafted for coal.

Cross-Q. 28. How far was that shaft from the top of the mountain?

Ans. I would say between two and three hundred feet.

Cross-Q. 29. Was the distance from that shaft to the top of the mountain greater or less than the distance from the Bell & Zimmerman tunnel to the top of the mountain?

Ans. About the same.

Cross-Q. 30. That mountain is forty or fifty miles long, is it not?

Ans. It is a long range of mountains. I can't tell the distance. I never went the whole length.

Cross-Q. 31. How high is the mountain in that locality, to the best of your judgment?

Ans. That I can't answer. The mountains along there are all about the same height, but I never heard the height mentioned.

Cross-Q. 32. It is one of the Blue Ridge range, is it not?

Ans. Yes, sir.

Re-direct by Mr. Smith:

Q. Q. 33. How much work was done on the tunnel that you have referred to before the lease was made?

Ans. A couple of days' work on the tunnel.

Re-cross by Mr. Hill:

Re-cross-Q. 34. How long before the lease was made was that couple of days' work done?

Ans. Inside of a week, as near as I can tell.

Re-cross-Q. 35. Were you present when the lease was made?

Ans. No, sir.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 24th day of November, 1882.

FRED. M. OTT,
Examiner.

SAMUEL A. FOOSE.

J. C. ZIMMERMAN *being produced, sworn, and examined, saith:*

Examined by Mr. Smith:

Q. 1. State your age, residence, and occupation.

Ans. I am thirty-one years of age, reside at Marysville, Perry county, Pennsylvania; I am a miller by trade, but have been working at railroading for the last six or eight years.

Q. 2. Where did you commence learning your trade?

Ans. I commenced learning my trade with L. C. Steinberger, at Bridgeport, about a mile from Landisburg, Perry county.

Q. 3. Did your father live there or near there?

Ans. Yes, sir: my father lived about a mile and a quarter from Landisburg.

Q. 4. How long did you work with Mr. Steinberger at that place, and where did you go next?

Ans. About a year, as near as I can recollect; and from there he moved to Cumberland county, to Eberly's Mills.

Q. 5. Did you go with him to Eberly's Mills, and work with him there?

Ans. Yes, sir.

Q. 6. How long did you stay there before going to another place?

Ans. About six or eight months, more or less; I can't just remember it exactly.

Q. 7. While you were there at that time did you become acquainted with George W. Kissinger and his family?

Ans. Yes, sir.

Q. 8. Where did you go to live from that place, and what did you do?

Ans. I went to New Cumberland, and I worked for Zacharias & Co., in a grist-mill or merchant mill.

Q. 9. Do you remember how long you remained there, or what time you left?

Ans. I was there about six months as near as I can remember.

Q. 10. Where did you go from there, and what did you do?

Ans. I went back to Perry county then, home: I worked on my grandfather's farm.

Q. 11. How long did you remain there, and where did you go next?

Ans. I can hardly answer that question: I don't remember how long I was at home that time; I can tell you where I went next, though; I went back to Cumberland county then, to Hurst's mill, on the Yellow Breeches creek, about a mile above Eberly's Mills.

Q. 12. What did you do there, and with whom did you work?

Ans. I worked in the grist-mill for Jonathan Nicholas.

Q. 13. How long did you work for him?

Ans. About a year.

Q. 14. Had you, during the time after you left Eberly's mills until you lived at Hurst's mill, kept up your acquaintance with Mr. Kissinger's family, and visited there from time to time?

Ans. Yes, sir.

Q. 15. Did you afterwards marry one of Mr. Kissinger's daughters?

Ans. Yes, sir.

Q. 16. When was that?

Ans. July the fourteenth, 1873.

Q. 17. Where were you living at that time?

Ans. I was living with my uncle then, within about two miles of Landisburg, Perry county.

Q. 18. Did you go to live with him directly from Hurst's?

Ans. No, sir.

Q. 19. Where did you go, and what did you do when you went away from Hurst's mill?

Ans. I went home to my grandfather's and worked on the farm part of the time; I had that for my home, and when I was there I worked when they had work.

Q. 20. Had you lived at any other place except your grandfather's and your uncle's after you left Hurst's mill, before you were married?

Ans. Yes, sir.

Q. 21. At what place or places, and what did you do?

Ans. I worked one month at Duncannon in a grist-mill.

Q. 22. When you were married where did you go with your wife?

Ans. To my uncle's.

Q. 23. How long did you and she remain there, and where next did you or either of you, go?

Ans. We were there together about a month and then she went home to her parents.

Q. 24. Did you after that go to her father's and stay with her at Eberly's Mills, and if so, when was it and for how long a time? or did you visit her, while she remained there, frequently?

Ans. Yes, sir; I visited her, but didn't go there to live.

Q. 25. How long did she remain there and when did you go to keeping house, and where?

Ans. She remained there until the spring of 1874; we then went to keeping house in Perry county about two miles from Landisburg.

Q. 26. Did you know of Mr. Kissinger's leaving that place, Eberly's Mills, if so, when was it and where did he go?

Ans. He left in the spring of 1874 and went to Marysville, Perry county.

Q. 27. What was his business at Eberly's Mills while you knew him there?

Ans. He kept store.

Q. 28. Have you ever lived at Eberly's Mills or been there since Mr. Kissinger moved away in the spring of 1874?

Ans. I was there once.

Q. 29. When was that?

Ans. I hardly remember whether it was in 1875 or 1876.

Q. 30. At the time when you first lived at Eberly's Mills did you know Mr. Daniel Drawbaugh?

Ans. I got acquainted with him shortly after I went there.

Q. 31. Did your acquaintance with him continue during the time that Mr. Kissinger lived there, more or less?

Ans. Yes, sir.

Q. 32. Where and how frequently and in what places were you accustomed to see him?

Ans. I saw him there at Eberly's Mills going backwards and forwards from the shop most every day.

Q. 33. Were you ever at his shop, and if so, how often?

Ans. I was at his shop, but can't remember how frequently.

Q. 34. Were you there frequently or only a few times?

Ans. Only a few times.

Q. 35. Do you remember what business was being carried on while you were there, or what Mr. Drawbaugh was at work upon?

Ans. I remember some of the things that he was at work upon.

Q. 36. Will you state, if you remember, what you have seen him at work upon or what you have seen about his shop?

Ans. I saw an electric clock, a weather-guage, a nail-machine, a force-pump and his tools and machinery that belonged to the shop.

Q. 37. Was his electric clock a single clock, or were there two clocks connected.

Ans. There were two clocks connected.

Q. 38. Do you remember the general appearance of those clocks and in what way they were connected

Ans. The one was one of those old fashioned high clocks; the other was an eight-square clock; they were connected by electricity, but I don't remember how: the one run the other.

Q. 39. Did you see any machines for talking, or that Mr. Drawbaugh said were for talking, or hear Mr. Drawbaugh say anything about such machines?

Ans. Not to the best of my knowledge.

Q. 40. When Mr. Kissinger moved to Marysville, what business did he engage in?

Ans. Farming.

Q. 41. Who owned the farm?

Ans. Mr. Draper.

Q. 42. How long did you continue to live near Landisburg, and what were you doing while there? I mean after you went to keeping house.

Ans. I lived there at Landisburg until the fall of 1875; I worked on a farm part of the time, and part of the time I worked in a mill for William J. Graham.

Q. 43. When did you quit working at the mill, and when did you break up housekeeping?

Ans. I quit the mill about the first of November, 1875, as near as I can tell; I did not break up housekeeping.

Q. 44. Did you and your wife move away from the place where you commenced housekeeping, and if so, where did you both go?

Ans. We moved from where we commenced keeping house to the mill in the spring of 1875, and kept house at the mill.

Q. 45. What did you do after Nov., 1875, when, as I understand, you left Graham's mill?

Ans. I moved my family to Marysville; I rented two rooms from Mr. Kissinger in his house; I went back to W. W. Snyder's, and run his mill, within a mile of Landisburg.

Q. 46. How long did you run his mill?

Ans. I run his mill from the 16th of November, 1875, till January 26, 1876.

Q. 47. How long did you stay with your family when you moved them to Marysville?

Ans. About a week or ten days, more or less.

Q. 48. Have you any memorandum showing when you went to Snyder's to work, and when you left? If so, state what the memorandum is, and in what it is kept.

Ans. Yes, sir; here is my book showing when I went to work: "J. C. Zimmerman commenced working for W. W. Snyder, November 16th, at twelve dollars per month:" I have not got the entry when I left. The last entry is, "27, by cash in full $10.69." The month is not written, but "27" is preceded by two dots, and higher up on the page is the word "December."

Q. 49. When did you commence keeping this book?

Ans. In the spring of 1874.

Q. 50. The entries which you have referred to do not, I believe, show the year in which they were made. Have you consulted Mr. Snyder's books to see what they contained? If so, will you state what you found.

[*Objected to by Mr. Hill, as incompetent and secondary.*]

Ans. Yes, sir; they contained the following: "Commenced November 16th, 1875, and quit January 26th, 1876."

Q. 51. Where did you go to reside when you left Mr. Snyder's?

Ans. I went to Marysville to my family.

Q. 52. Where have you lived since then?

Ans. I have lived at Marysville since then with the exception of about eight months; I have had my family there though all the time.

Q. 53. What houses have you lived in at Marysville?

Ans. I only have lived in the two houses at Marysville, the one Mr. Kissinger lived in and the one that I am living in at present.

Q. 54. How long did you live in Mr. Kissinger's house—till when?

Ans. Till the spring of 1880, as near as I can tell

Q. 55. Did you live there until he moved away from Marysville?

Ans. Yes, sir; I moved the day before he did.

Q. 56. You say you were away from Marysville eight months; when was that, and where did you go to?

Ans. That was last year, (1881.) I went to Iowa.

Q. 57. When you came down to live at Marysville early in 1876, whom did you go to work for?

Ans. I worked for the Pennsylvania Railroad Company.

Q. 58. Have you worked much for that company since then?

Ans. I worked on it till the fourteenth of June, 1881, off and on, that is.

Q. 59. What part of the road was your work on; what kind of work did you do?

Ans. I worked on track repairs. The two first years I worked in the floating-gang. We worked from Harrisburg to Newport, above Marysville. After that, I worked on section No. 4, at Mayrsville.

Q. 60. While you worked in the floating-gang, did you ever know of an opening for a coal mine in the Cove mountain, above Marysville?

Ans. Yes, sir.

Q. 61. Did you ever go to see it; and if so, when, and under what circumstances, and who went with you?

Ans. I was up in the after part of the summer of 1877. My wife and I walked up.

Q. 62. What sort of an opening did you find there.

Ans. They had a pretty good sized hole dug down, and there was an off-set in it, so that you couldn't see how deep it was.

Q. 63. Do you remember any circumstance that happened during that visit?

Ans. Yes, sir; my hat blowed down into it.

Q. 64. Did you get your hat out again?

Ans. No, sir.

Q. 65. Did you ever see it again?

Ans. Yes, sir; I did.

Q. 66. On whose head?

Ans. On Jacob Weaver's—a man who worked in the mine.

Q. 67. Had you ever worked with Weaver before he worked in the mine?

Ans. Yes, sir; I worked with him that same spring.

Q. 68. Whom did you and he work for that spring?

Ans. Mr. Galt; peeling bark.

Q. 69. If you have any entry in the memorandum-book that shows when you peeled bark for Mr. Galt, that spring, will you please refer to it, and tell us what dates it gives for the time you worked for him?

Ans. Here it is.

(The account produced covers a page and a half, and contains a charge for each day's work, as "peeling bark," "unloading bark," etc.

The first entry is April 23, 1877; the last is June 21, 1877.)

Q. 70. Do you think it was mentioned at home to the Kissinger family, that you had gone up there to see the opening, and had lost your hat?

(Objected to by Mr. Hill, as leading, and calling for mere opinion; if the witness remembers mentioning, he should be asked to state his memory, and not what he thinks he may have done.)

Ans. It was.

Q. 71. How near to the old bone-mill was the opening you went to that day, and whereabouts was it situated with reference to the bone-mill?

Ans. It is near about opposite the bone-mill, near the top of the mountain, within about two hundred yards, I think, of the top of the mountain.

Q. 72. Did you know at the time who made that opening, or what men had worked sinking that shaft?

Ans. Mr. Foose was the manager; he had a man by the name of Lawrence Baker and Jacob Weaver—them two I know.

Q. 73. Did Jacob Weaver work with you all the time that you worked for Galt that spring?

Ans. No, sir; he didn't.

Q. 74. Which of you stopped working for Galt first?

Ans. Weaver.

Adjourned until November 25th, 1882, at 9.30, A. M.

NOVEMBER 25, 1882, 9.30, A. M.

Examination resumed pursuant to adjournment; present, same counsel.

Examination of J. C. Zimmerman, by Mr. Storrow, continued.

Q. 75. Will you name any other man who worked with you, for Galt, peeling bark, in the spring of 1877?

Ans. Yes, sir; there was Lawrence Baker, Peter Heisly, and Metz—I don't know his first name.

Q. 76. Did those three men stop working for Galt before you did or after you did?

Ans. Before I did.

Q. 77. You have spoken of a coal mine opening in the Cove mountain right up the mountain from the fertilizer-mill, which you say you went to in the spring of 1877, and where you say you lost your hat; was that visit in hot weather, or in cold weather, and what sort of a hat was it?

Ans. Hot weather; it was a straw hat.

Q. 78. Did you ever go to any other coal mine opening on Cove mountain?

Ans. No, sir.

Q. 79. Did you, at that time, know of any other coal mine opening on Cove mountain?

Ans. No, sir.

Q. 80. You have testified that you left Snyder's mill, near Landisburg, and came down to live at Marysville, January 27, 1876; how soon after that did you go to work for the Pennsylvania Railroad Company?

Ans. About a week or two afterwards.

Q. 81. What gang did you hire into first?

Ans. I hired to Alfred King's gang, and the gang being full I was transferred to Chambers' gang.

Q. 82. Were you afterwards re-transferred to King's gang, and if so, how soon?

Ans. I was, about a month afterwards, as near as I can tell.

Q. 83. Has Mr. Alfred King got a brother living at Marysville?

Ans. Yes, sir; George King, supervisor of the division of the Pennsylvania railroad between Harrisburg and Newport. He was supervisor at the time I moved there.

(Certificate of Mr. King, put in evidence as follows:

"PENNSYLVANIA RAILROAD COMPANY,

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I hereby certify, J. C. Zimmerman was employed by P. R. R. Co. in Floating Gang 4, during month of February and March, 1876, commencing Feb'y 2nd.

I know this man personally.

G. W. KING,
Supervisor."

[*Certificate objected to by Mr. Hill as incompetent.*])

Q. 84. Did Mr. Draper, the owner of Mr. Kissinger's farm, stay at Mr. Kissinger's during the few days while you were there in November, 1875, and before you went to work for Snyder?

Ans. He wasn't there.

Q. 85. Do you remember the fact of Mr. Drawbaugh's putting in a ram at Mr. Kissinger's while you lived there?

Ans. Yes, sir.

Q. 86. It appears from the books and papers put in evidence in the deposition of Mr. George W. Kissinger—

(*Mr. Hill objects to the memory of the witness being refreshed, or his testimony being directed, by any reference to the previous testimony as to dates.*)

—complaintant's testimony, pages 554 and 555, that some pipe for Mr. George Kissinger came to Marysville by railroad, and that it was receipted for by "J. C. Zimmerman:" are you the J. C. Zimmerman who receipted for it?

Ans. Yes, sir.

Q. 87. Did you receive that pipe, and what did you do with it?

Ans. Yes, sir; and I hauled it home to Mr. Draper's farm for Kissinger, for the ram.

Q. 88. What was that pipe afterwards used for?

Ans. It was used for the water-pipe for the ram.

Q. 89. Do you remember of Mr. Kissinger and Mr. Draper going over from Marysville to Mr. Drawbaugh's shop to see about getting a ram for the farm?

Ans. Yes, sir.

Q. 90. Did you know of their visit at the time that they made it, and if so tell me how you know about it, and what you know of it?

Ans. I knew that they were over and ordered a ram; I heard the family talking that that was where they went to.

[*Objected to by Mr. Hill as hearsay.*]

I can make it stronger than that; I heard the old gentleman, Mr. Kissinger, tell about it after he got back.

[*Objected to by Mr. Hill as hearsay.*]

Q. 91. How soon after he got back did you hear him tell of it?

[*Same objection.*]

Ans. That evening.

Q. 92. Where was Mr. Draper staying at that time?

Ans. At Mr. Kissinger's.

Q. 93. Tell me as near as you can when it was that this visit of Mr. Draper and Mr. Kissinger to Drawbaugh to see about the ram took place.

Ans. In the fall of 1877.

Q. 94. Was this visit before the time when you lost your hat in the mine-opening, or after you lost your hat?

Ans. After I had lost my hat.

Q. 95. Do you remember whether or not logs were bored for that ram?

Ans. There was.

Q. 96. Do you remember whether or not John Kissinger helped to bore those logs?

Ans. He did.

Q. 97. Do you remember whether or not Mr. Drawbaugh came over to put in that ram?

Ans. Yes, sir; he did.

Q. 98. If you saw him at Mr. Kissinger's when he came over to put in the ram, please state when you saw him there on that work and any circumstances which enable you to fix the date.

Ans. He came there on the fourth of November, 1878, the day before the election; I had went to Harrisburg, me and my wife, and when we came home Mr. Drawbaugh was there; that was on Monday, the fourth of November; on Tuesday was the election, the fifth of November. My wife and I started away on a visit to my folks, within a mile of Landisburg; we were away about one week. When we came home the ram was up and running. Mr. Drawbaugh was gone and Mr. Draper and his daughter were there.

Q. 99. What part of the day was it when you and your wife started for Landisburg on that visit?

Ans. It was in the morning. I voted before I started.

Q. 100. When you worked in the mill at Eberly's mills in 1871, whom did you board with?

Ans. L. C. Steinberger.

Q. 101. After you moved away from Eberly's mills did you ever work for Steinberger, and if so, when and where?

Ans. In 1874 I worked for him off and on a few days and sometimes a week, at Bridgeport, Perry county, within a mile of Landisburg, at milling.

Q. 102. Was he running a mill up there then?

Ans. Yes, sir.

Q. 103. Did he ever mention to you anything about Mr. Drawbaugh's having a talking machine?

Ans. No, sir.

Q. 104. You have testified that you went to live at Eberly's mills about February, 1871, and married Mr. Kissinger's daughter at Eberly's mills in July, 1873; how soon after you first went to Eberly's mills did you begin to be attentive to Miss Kissinger?

Ans. About a month, more or less.

Q. 105. While you worked at Zacharias' mill at New Cumberland, and at Hurst's mill on the Yellow Breeches, where did you get your mail?

Ans. When I worked at New Cumberland I got it at New Cumberland, and when I worked at Hurst's mill I got it at Eberly's Mills.

Q. 106. Whereabouts in Eberly's Mills was the post-office at that time?

Ans. At Mr. Kissinger's store.

Q. 107. Was Hurst's mill the mill which was afterwards known as Hake's mill, with a distillery near it?

Ans. Yes, sir.

Q. 108. While you lived in that neighborhood did they use to have gatherings of the neighbors at Mr. Kissinger's store Saturday nights, and were you in the habit of going there then?

Ans. Yes, sir; I used to go there.

Q. 109. Was it the habit at those gatherings to talk over and gossip pretty freely about what was going on in the neighborhood?

Ans. It was.

[*Objected to by Mr. Hill as incompetent.*]

Q. 110. Could it have been known or talked about in the village that Mr. Drawbaugh had a talking machine, by which a person could talk from one place to another and be understood, and you not heard of it during the years that you lived at Eberly's Mills?

[*Objected to by Mr. Hill, as leading, argumentative, incompetent, and calling for mere opinion.*]

Ans. No, sir.

Q. 111. If you had known or heard of such a thing would you or would you not have remembered it?

[*Same objections.*]

Ans. I would have remembered something about it.

Q. 112. Has Mr. Drawbaugh been to you within a year or two and asked you whether you remembered anything about his having talking machines?

Ans. He was.

Q. 113. What did you tell him?

Ans. I told him I knowed nothing about it.

Q. 114. Had anybody been to you before that to ask you about talking machines?

Ans. No, sir.

Q. 115. Was anybody with Mr. Drawbaugh when he came?

Ans. There was.

Q. 116. Do you remember whether it was hot weather or cold weather when Mr. Drawbaugh came to you?

Ans. I don't remember.

Q. 117. I believe that there are now two railroad stations at Marysville, the old one of which is called Marysville, and the new one is about a mile towards Harrisburg, and is called "Haley's;" which of them is nearer to the Draper house, where Mr. Kissinger and you lived?

Ans. There ain't much difference in distance. Haley's would be the nearest by the road, but there is a path that goes to Draper's from Marysville.

Cross-examined by Mr. Hill.

Cross-Q. 118. What do you say was the date of your marriage?

Ans. I was married on the 14th of July, 1873.

Cross-Q. 119. Who performed the marriage ceremony?

Ans. Mr. Drawbaugh's brother, Squire John B. Drawbaugh.

Cross-Q. 120. Who was present at the wedding ceremony?

Ans. Hiram Drawbaugh, Abraham B. Shank, and my wife's mother, Mrs. Kissinger.

Cross-Q. 121. Have you any children? If so, what are their names and ages, respectively?

Ans. I have three children. Benjamin Edward, between nine and ten; Charles, about eight years old; Harry, three years old.

Cross-Q. 122. What is Harry's birthday?

Ans. I didn't bring my family record along. I can't tell you.

Cross-Q. 123. What was Charles' birthday?

Ans. I have forgotten.

Cross-Q. 124. What was Benjamin Edward's birthday?

Ans. July 10, 1873.

Cross-Q. 125. He was born four days before you were married, was he?

Ans. Yes, sir.

Cross-Q. 126. Abraham B. Shank was constable of Lower Allen township, was he not?

Ans. Yes, sir.

Cross-Q. 127. How happened he to be present at your wedding?

Ans. He had the pleasure of fetching me.

Cross-Q. 128. In his official capacity as constable?

Ans. Yes, sir.

Cross-Q. 129. Was the ceremony performed in your wife's bedroom?

Ans. Yes, sir.

Cross-Q. 130. Was she in her bed at the time?

Ans. Yes, sir.

Cross-Q. 131. Do you know John Comfort, who resides not far from Eberly's mills?

Ans. Yes, sir.

Cross-Q. 132. Have you ever talked with him about this case?

Ans. Yes, sir.

Cross-Q. 133. When first and on how many different occasions?

Ans. This last spring, just the once.

Cross-Q. 134. Where was that?

Ans. At Marysville.

Cross-Q. 135. At any house or building?

Ans. He came to the foreman of the Northern Central yard, at Marysville, and asked to leave him take me aside to talk to; that was the first time and last that I talked with him.

Cross-Q. 136. Did anybody come with him; if so, who?

Ans. Mr. Storrow.

Cross-Q. 137. Do you know Mr. Geib, the station agent at Marysville?

Ans. Yes, sir.

Cross-Q. 138. Did he and Mr. Comfort ever come to see you about this case?

Ans. No, sir.

Cross-Q. 139. How were you notified to come down here and testify?

Ans. Mr. Storrow notified me.

Cross-Q. 140. Did he send you money to pay your expenses down here?

Ans. Yes, sir.

Cross-Q. 141. When did you come here?

Ans. Thursday afternoon.

Cross-Q. 142. Did you talk over the case pretty thoroughly with complainants' counsel before taking the stand to testify?

Ans. He asked me some few questions.

Cross-Q. 143. Did you read or hear read the testimony of Mr. Kissinger and his sons in this case, or any part of it?

Ans. No, sir.

Cross-Q. 144. Did complainants' counsel tell you what it was or what any of it was?

Ans. No, sir.

Cross-Q. 145. Then you don't now know what the testimony of Mr. Kissinger and his sons was, do you?

Ans. No, sir; I don't know a word that they gave in.

Cross-Q. 146. Did they read over to you Mr. Draper's testimony in this case, or tell you what it was?

Ans. No, sir.

Cross-Q. 147. Then you don't now know what Mr. Draper testified to, do you?

Ans. Mr. Storrow told me when he came to see me, that Mr. Draper give in testimony that he had ordered the ram in 1873 or 1874.

Cross-Q. 148. Do you mean the time that Mr. Storrow and Mr. Comfort came to see you together?

Ans. No, sir.

Cross-Q. 149. How many times has Mr. Storrow been up to see you, and talk the matter over?

Ans. Mr. Storrow was up three times, with the time that Mr. Comfort was with him.

Cross-Q. 150. Give the dates of those three visits of Mr. Storrow to you?

Ans. I will give them as near as I can. Him and Mr. Comfort was there in the spring I can't just give the date, and then he was up about two months ago, as near as I can tell. It might have been more, or it might have been less. He came to my house one evening after dark, and then he was up on last Wednesday, and gave me my subpœna.

Cross-Q. 151. How near can you come to the date when Mr. Storrow and Mr. Comfort came to see you?

Ans. I can't give no date.

Cross-Q. 152. Can you come within a month or two months or three months of it?

Ans. It was along about April or June. Somewheres along there, between the first of April or last of June. I don't remember the date. I didn't expect I would have to go this far.

Cross-Q. 153. You say Mr. Storrow came to see you about two months ago, it might have been more, it might have been less; how much more or how much less might it have been?

Ans. I can't give the exact date.

Cross Q. 154. Might it have been two months more or two months less?

Ans. I couldn't say.

Cross-Q. 155. Did Mr. Storrow tell you where he was at work, or what he was doing at that time; and, if so, was he taking testimony in this case at Harrisburg?

Ans. Mr. Storrow told me that he was at Boston. He didn't say what he was doing.

Cross-Q. 156. Did you ever talk over any of these matters you have testified to with your father-in-law, Mr. Kissinger, or any of his sons?

Ans. I never did with the old gentleman. The boys and I talked over some little things.

Cross-Q. 157. Which of the boys, and when, and how many times?

Ans. Frank, Cyrus, and John Kissinger. I can't give the dates. It was this last summer, though, that we talked over it. I couldn't tell you how many times.

Cross-Q. 158. Where is John now?

Ans. In Chicago.

Cross-Q. 159. Did you know of his coming on to testify in this case this last summer?

Ans. Mr. Comfort told me, when he was to see me, he thought they would fetch him in.

Cross-Q. 160. Did you talk it over with John while he was on to testify?

Ans. No, sir. I asked him some few questions, but he would not tell me.

Cross-Q. 161. Why wouldn't he tell you?

Ans. He told me if I would wait awhile, I would get a chance to find out myself, without him telling me.

Cross-Q. 162. Was that before or after he testified in the case?

Ans. After.

Cross-Q. 163. How long after?

Ans. About two or three days.

Cross-Q. 164. When did you talk it over with Cyrus?

Ans. Cyrus and I has talked it over several times this summer. We talked it over about two or three weeks ago.

Cross-Q. 165. Frank's full name is George Franklin Kissinger, is it not?

Ans. Yes. George F., we generally write it.

Cross-Q. 166. When did you talk it over with George F., and how many times?

Ans. I can't give the number of times. We talked it over, though, this summer.

Cross-Q. 167. Where is he at work now?

Ans. He is working at Rockville, Dauphin county; but he boards with his brother, Cyrus, at Marysville, Perry county, Pennsylvania.

Cross-Q. 168. How long has he been boarding with his brother, Cyrus, in Marysville?

Ans. About four months, as near as I can give it.

Cross-Q. 169. What is he doing at Rockville?

Ans. He is working on a new branch railroad that the Pennsylvania Company is building there; he is working as a laborer putting down track.

Cross-Q. 170. Have you seen him pretty often this summer and fall?

Ans. I seen him frequently, yes.

Cross-Q. 171. Have you talked over with him this fall anything relating to this case; if so, how many times?

Ans. I asked him, once, whether he ever saw anything about Mr. Drawbaugh's shop concerning a talking machine; he said, not that he remembered. I can't just give the number of times we have talked about this talking machine; when he would come to my house we would talk about it, sometimes; but I never kept no account of the number of times that we talked about it.

Cross Q. 172. Did you talk over the subject of the ram with him and the other boys, or anything relating to it?

Ans. Nothing more that I remember than that John said, when he was in, that he had helped to bore the wooden pipe for it before he went out to Chicago.

Cross-Q. 173. Did you talk over the subject of the coal mine, or anything relating to that, with the boys?

Ans. Not lately.

Cross-Q. 174. Have you within the last eight months?

Ans. No, sir.

Cross-Q. 175. You remember John's helping to bore the wooden pipe, do you?

Ans. Yes, sir.

Cross-Q. 176. Do you also remember that he helped bore that pipe before he went to Chicago?

Ans. Yes, sir.

Cross-Q. 177. How long did he help bore it before he first went to Chicago?

Ans. They hadn't more than finished the job—I couldn't say positively whether they were quite done—but they were working at it about the time when he went to Chicago.

Cross-Q. 178. Was he working for his father about that time; if so, how long had he been working for his father?

Ans. I can't give the exact time he was working for his father; he was working for him some, though, or had been working.

Cross-Q. 179. How long was the ram put in after he did that work on the boring?

Ans. The ram was put in commencing the fourth day of November, 1878.

Cross-Q. 180. Do you do any work on boring for the ram?

Ans. No, sir.

Cross-Q. 181. Who did work on it besides John?

Ans. I couldn't say; I remember that John worked on it and his father, but whether they had any strange men I could not say.

Cross-Q. 182. Do you remember that John came back from Chicago at one time and stayed five or six months about home?

Ans. Yes, sir.

Cross-Q. 183. The boring, if I understand you, was not done then, but before he *first* went; am I correct?

Ans. No, sir; it wasn't done before he went the first time, but before he went the second time.

Cross-Q. 184. If that statement is correct why did you testify in answer to Question 176, that you remembered that he helped bore that pipe before he went to Chicago?

Ans. He did help to bore that pipe before he went to Chicago *this last time*; I didn't make no dates when.

Cross-Q. 185. When you gave that 176th answer did you have distinctly in mind the two times of his going to Chicago?

Ans. No, sir; there was nothing said about the first time he went.

Cross-Q. 186. If there had been anything said about its being the first time, you would have noticed it, and answered correctly, would you?

Ans. If they would have asked me whether he helped to bore the pipe before he went the first time, or before he went the last time, I would have said that it was before he went the last time.

Cross-Q. 187. As a matter of fact my 176th question to you was "Do you also remember that he helped bore that pipe before he first went to Chicago?" To which you answered: "Yes, sir," before the examiner wrote the question down. The examiner inadvertently omitted the word "first" in writing the question down; did you not hear me use the word "first," in that question, and did you not understand me to inquire whether he helped bore the pipe before he first went to Chicago, and did you not answer—"Yes, sir?"

Ans. If you did ask me whether he helped first, you hadn't asked me anything about the first time he went to Chicago, because I positively say that he helped to bore the pipe before he went the last time.

(Question repeated and answer required to the three interrogatories contained in it. Witness continues.)

I understood him to ask whether he bored the pipe before he *went* to Chicago; I didn't understand you to ask whether he helped bore the pipe before he first went to Chicago, because I knew that it was not before he went the first time; he didn't put the time in; he just asked me whether he helped bore the pipe first before he went to Chicago; he didn't ask me whether he helped to bore the pipe before he went the first time.

Cross-Q. 188. You heard the word "first" in the question then, did you?

Ans. Yes, sir; but if you had put the question to me properly I wouldn't have answered it "Yes, sir," but would have answered it "No, sir;" I aint positive whether he put that question to me or not; I have been asked a good many questions, but if I answered that question "Yes, sir," I didn't mean it, that is, if he put it the way he says he did.

Cross-Q. 189. I did put it the way I say I did, and I followed it with question 177, which was:—"How long did he help bore it before he first went to Chicago?" to which you answered:—"They hadn't more than finished the job," etc.; how do you reconcile that answer with your present statement?

Ans. I didn't understand it in that way.

Cross-Q. 190. When did John go to Chicago the first time?

Ans. I don't remember the date, nor the day, nor the month, nor the year.

Cross-Q. 191. In your 172d answer you say, that John told you this summer or fall that he helped to bore the wooden pipe before he went out to Chicago; did he tell you that it was before he went out the second time?

Ans. Before he went out the second time.

Recess for dinner, until three, P. M.

Cross-Q. 192. Where did you vote in November, 1878?

Ans. At Marysville.

Cross-Q. 193. For whom did you vote?

Ans. I don't remember.

Cross-Q. 194. Don't you remember any of the persons for whom you voted at that election?

Ans. No, sir.

Cross-Q. 195. Did you vote for President?

Ans. I told you once I don't know who I voted for. I don't remember.

Cross-Q. 196. Don't remember whether it was a presidential election, State election, or borough election, do you?

Ans. It was no borough election. Borough election comes in the spring.

Cross-Q. 197. What precinct did you vote at?

Ans. Explain what you mean by precinct.

Cross-Q. 198. I mean at what particular voting place did you deposit your ballot?

Ans. At Shreiner's hotel, Marysville.

Cross-Q. 199. What officers received your vote, or were in charge of the ballot-box at the time?

Ans. I don't remember.

Cross-Q. 200. In how many different years did you ever vote at Marysville at presidential or State elections?

Ans. Three times, I think. I am not sure.

Cross-Q. 201. In what years were they?

Ans. I don't just remember.

Cross-Q. 202. Where were you living in November, 1876, and what were you doing?

Ans. In Marysville. I can't just tell you what I was doing in November.

Cross-Q. 203. Did you vote there November, 1876?

Ans. I don't remember whether I did, or whether I didn't.

Cross-Q. 204. What were you doing November, 1878?

Ans. Working for the Pennsylvania Railroad Company.

Cross-Q. 205. What were you doing for them?

Ans. Working on the track repairs.

Cross-Q. 206. In whose gang?

Ans. J. W. Beer's, division No. 4.

Cross-Q. 207. What were you doing November, 1874, and where were you living?

Ans. I lived within about two miles of Landisburg. I worked amongst the farmers at labor work.

Cross-Q. 209. What were you doing and where were you living in November, 1877?

Ans. I lived at Marysville, and worked for the Pennsylvania Railroad Company, on Division No. 4.

Cross-Q. 210. What were you doing and where were you living in November, 1875?

(Witness refers to his book.)

I wish to test your memory; please lay your book aside.

[*Mr. Smith instructs witness that he may refer to his book, after which witness refers to said book—a small pocket memorandum book which he had taken out of his coat pocket, and then continues:*]

Ans. About the first of November I moved my family to Marysville; I then went back within a mile of Landisburg, run a grist-mill for W. W. Snyder, from the 16th of November, 1875, till January 26, 1876. This is a memorandum I just wrote off from Mr. Snyder's books.

(Respondents' counsel asks leave to look at the book; witness shows it to him and he looks at it. Respondents' counsel then asks the examiner to certify an exact copy of the page in the memorandum book, to which page the witness refers.)

The page is as follows:

"Commense
Milling November
the 16th, 1875
And quit
January the 26, 1876.
Drawbaugh
Comenst to put the
Ram in
On the 4 of
November 1878."

[*Mr. Hill objects to any reference to this memorandum-book, because it is not original evidence; and objects to the witness' using it to refresh his memory, or fix dates; and to all testimony in connection with which the witness has used the book while testifying. Respondents' counsel turns over the leaves of the book, and examines the rest of it.*]

Cross-Q. 211. I find that more than half the leaves of your memorandum-book have been torn out; when was that done?

Ans. I have no dates. I tore them out as I needed the paper.

Cross-Q. 212. And on the page next before the one on which the above memorandum occurs there has been writing in pencil, which was afterwards erased; when was that done? When was that writing put there, and when was it erased, and why?

Ans. I put that there yesterday—wrote it, and rubbed it out. I didn't want it there. That was the reason I rubbed it out.

Cross-Q. 213. Why didn't you want it there?

Ans. I had no use for it.

Cross-Q. 214. Why did you put it there?

Ans. I was counting up my expenses in coming here; and, after I found it out, I rubbed it away.

Cross-Q. 215. Did it relate to your expenses in coming here?

Ans. Yes, sir.

Cross-Q. 216. Now, although the writing has been pretty carefully erased, yet there is enough of it remaining to read quite plainly as follows: "I went to Eberly's mills in the spring of 1871;" will you tell me what that has to do with your expenses in coming here?

Ans. I made a mistake in the place in the book.

[Book has not been shown witness from the time Mr. Hill first took it until after the last answer was made. Witness now looks at the book.]

Cross-Q. 217. The figures to which you now refer as your expense; memorandum are made on the stiff cover at the last end of the book, are they not?

Ans. Yes, sir.

Cross-Q. Why did you erase those words: "I went to Eberly's mills in the spring of 1871," and when?

Ans. I was going to write a memorandum of the time I went there till I left. Then I thought it wasn't necessary, and I rubbed it away yesterday.

Cross-Q. 219. And the other memoranda, on the next page, you thought were necessary, and so you left them stand, did you?

Ans. Yes, sir.

Cross-Q. 220. When did you put into the book the memoranda on the next page, a copy of which I have had entered on the record above?

Ans. On Thursday morning.

[*Mr. Hill repeats his objection to the book and its contents, and all testimony based upon it.*]

Cross-Q. 221. Do you say that Mr. Drawbaugh put in that ram himself?

Ans. He was the only one I seen, that is, stranger that came there.

Cross-Q. 222. Did you see him put in the ram?

Ans. I didn't just see him put it in, but he was getting ready to put it in when I left.

Cross-Q. 223. How do you know it was on the 4th day of November?

Ans. Because it was the day before election.

Cross-Q. 224. How do you know the election was on the 5th of November?

Ans. Because the election comes on the first Tuesday following the first Monday of November.

Cross-Q. 225. That does not indicate that it was on any particular day prior to the 7th day of November?

Ans. My calendar gives it on that day. I have the calendar of that year.

Cross-Q. 226. When did you examine the calendar, to see?

Ans. On Thursday morning before I started down here.

Cross-Q. 227. Had you ever examined it before, to see?

Ans. Yes, sir; once.

Cross-Q. 228. When was that?

Ans. I don't remember the date.

Cross-Q. 229. What time of day was it when Drawbaugh came up there to put in the ram?

Ans. I can't tell you just what time. Me and my wife went to Harrisburg. We came home in the afternoon and he was there.

Cross-Q. 230. He wasn't there before you went away in the morning, was he?

Ans. No, sir; he came some time through the day while we were away.

Cross-Q. 231. How long did he remain there after you got back home at night?

Ans. He was there on Tuesday morning.

Cross-Q. 232. Did he do any work on the ram on Tuesday morning?

Ans. Yes, sir; getting pipe ready.

Cross-Q. 233. Was the pipe put in Tuesday?

Ans. I don't know. Me and my wife started away on Tuesday and were away for a week, as near as I can tell. When we came home the ram was running.

Cross-Q. 234. Whom did you and your wife visit during that week that you were away?

Ans. My grandfather and mother and uncles and aunts.

Cross-Q. 235. Give their names and residences?

Ans. Benjamin Reiber and Mrs.; my uncle was Ely Dunkleberger, and Mrs.; Louis Sweger and Mrs. That's about all. My grandfather lived about two miles and a half east of Landisburg. Dunkleberger lived in part of the same house and farmed the place. Sweger lived at Bridgeport, a mile east of Landisburg.

Cross-Q. 236. Are they all living now?

Ans. They were living last week.

Cross-Q. 237. In the same places?

Ans. My grandfather lives at the old homestead yet; he bought a small place adjoining his, where Dunkleberger now lives and farms the place. Sweger sold his property at Bridgeport and bought a farm six miles east of Landisburg, at Shermansdale, and lives there.

Cross Q. 238. Did you take any of your children with you on that visit?

Ans. Two.

Cross-Q. 239. Which ones?

Ans. The two oldest.

Cross-Q. 240. Did yourself, your wife, and two children ever visit your grandfather at any other time except that?

Ans. That was the first time after we moved to Marysville.

Cross-Q. 241. Had you and your wife and those two children ever visited there together before you moved to Marysville?

Ans. Yes, sir; frequently.

Cross-Q. 242. Do you remember anything that took place at your grandfather's or aunt's or uncle's at that particular visit?

Ans. Nothing particular.

Cross-Q. 243. How did you go up there and how did you come back?

Ans. I rode up and I rode back.

Cross-Q. 244. With whose team?

Ans. Mr. Kissinger's beast and Mr. Couns' ambulance.

Cross-Q. 245. Who was Mr. Couns? Give his full, name please, and his business and present residence.

Ans. Mr. Couns is a farmer; he is now retired, and lives in Marysville, in the borough.

Cross-Q. 246. Was he living on his farm at the time you made that visit?

Ans. Yes, sir.

Cross-Q. 247. How long did he live on his farm after you made that visit?

Ans. He lived on his farm till last spring.

Cross-Q. 248. Have you ever, with your wife and those two children, visited your grandfather since that time?

Ans. No, sir.

Cross-Q. 249. Or visited any of the relatives whom you visited at that time?

Ans. No, sir.

Cross-Q. 250. Where were you living when Mr. Draper and Mr. Kissinger went together to Mr. Drawbaugh's shop to see about getting the ram?

Ans. In part of Mr. Kissinger's house on Draper's farm.

Cross-Q. 251. How long was Mr. Draper visiting there at Mr. Kissinger's at that time?

Ans. About a week or ten days, as near as I can tell.

Cross-Q. 252. Did you see him every day?

Ans. I can't just say whether I did, or not. He was there, though. That was his stopping place. I went to work early, and came home late. I didn't just run into the old folks' part to see whether he was there. I was in my own part of the house most of the time.

Cross-Q. 253. Had you ever seen Mr. Draper before?

Ans. No, sir.

Cross-Q. 254. Where were you working when Mr. Draper was there, when you returned home from your work every night?

Ans. For the Pennsylvania Company, on division No. 4, for J. W. Beers.

Cross-Q. 255. You say that that visit of Mr. Draper's was after you lost your hat, do you?

Ans. The visit of 1877. When he was there in the fall of 1877? (Mr. Hill asked the examiner to certify that while he was putting question No. 255, Mr. Smith remarked: "The witness hasn't testified to that yet." After which Mr. Hill added the last part of the question, "Do you!" The witness then answered as follows:) I don't know which visit of Mr. Draper you refer to. He made three visits.

Cross-Q. 256. Have I said anything to you about any visit except the one during which Mr. Draper and Mr. Kissinger went together to Drawbaugh's shop?

Ans. I don't just remember whether you did or whether you did not.

Cross-Q. 257. Well, I mean that visit. Did you lose your hat in the coal mine before that visit or after?

Ans. I lost my hat before he came up that time.

Cross-Q. 258. Now tell us exactly how you are able to fix that fact as the hat seems to have had no connection with Mr. Draper in any way.

Ans. Because it was in the summer time, and I wore a straw hat until I lost it. Mr. Draper came in the fall, after seeding time. If I remember right, seeding was done when he came there, and corn was away. I know it was in the fall, because the old gentleman had his corn put away already when he came there.

Cross-Q. 259. Did you talk with Draper about the hat?

Ans. No, sir.

Cross-Q. 260. Did you talk with Draper about the coal mine?

Ans. Not that I remember.

Cross-Q. 261. Do you remember having any conversation with Draper about the coal mine during that visit?

Ans. I heard him and Mr. Kissinger talking about it one evening as I passed through their room to my room; I don't know what particular conversation there was about it.

Cross-Q. 262. You didn't take part in the conversation then?

Ans. No, sir.

Adjourned until 9.30, A. M., November 27, 1882.

November 27, 1882, 10, A. M.

Examination resumed, pursuant to adjournment.

Present, Mr. Smith for complainants, and Mr. Hill for respondents.

Cross-examination of J. C. Zimmerman, by Mr. Hill, continued.

Cross-Q. 263. When did you first become acquainted with Jacob Weaver, the man on whose head you saw your straw hat at one time?

(Witness refers to his account book.)

Ans. I became acquainted with him in the spring of 1877.

Cross-Q. 264. In answer 67 you say you had worked with Weaver before he worked in the mine—you had worked with him that same spring; how do you know that he had not worked in the mine before you worked with him that spring?

Ans. I wasn't acquainted with Weaver till the spring of 1877.

Cross-Q. 265. Then you don't know what he did before the spring of 1877?

Ans. No, sir.

Cross Q. 266. Where does he live now?

Ans. I don't know.

Cross-Q. 267. For whom did he work the last you knew of him, and where?

Ans. For Mr. Foose, at the coal mine.

Cross-Q. 268. When did you first become acquainted with Lawrence Baker?

Ans. In the spring of 1877.

Cross-Q. 269. Do you know where he resides now, and what he is doing?

Ans. No, sir.

Cross-Q. 270. When did you last know of him, where was he then, and what was he doing?

Ans. Working for Foose in the coal mine in 1877.

Cross-Q. 271. When did you first become acquinted with Peter Heisley?

Ans. In the spring of 1877.

Cross-Q. 272. Do you know where he is now, and what he is doing?

Ans. Yes, sir. He is carrying on a brickyard about four miles east of Marysville.

Cross-Q. 273. When did you first become acquainted with Metz, who worked with you for Galt in the spring of 1877?

Ans. I became acquainted with him that spring—1877.

Cross Q. 274. Where is he now, and what is he doing?

Ans. I don't now, sir.

Cross-Q. 275. Have you ever been up on Cove mountain since that visit when you lost your hat?

Ans. Yes, sir.

Cross-Q. 276. To the coal mine?

Ans. No, sir.

Cross-Q. 277. Were you ever up to the coal mine region before that visit when you lost your hat?

Ans. I never was up to the mine before. There is only one mine that I know of.

Cross-Q. 278. When you thought you saw your hat on Jacob Weaver's head, did you say anything to him about it?

Ans. No, sir; not at the present time. I didn't.

Cross-Q. 279. Did you ever say anything to him about it; if so, when first?

Ans. I don't just remember the date, but I talked to him and told him that he had got my hat—got the hat that was in the mine.

Cross-Q. 280. How long after you had lost your hat in the mine did you say that to Jacob Weaver?

Ans. I don't just remember. Three or four weeks or may be longer.

Cross-Q. 281. Did he have the hat on his head when you said that to him?

Ans. I think not. I think he wore a cap at that time.

Cross-Q. 282. Did you ever get the hat back from him?

Ans. No, sir.

Cross-Q. 283. What kind of a looking hat was that?

Ans. It was a straw hat with a black band on.

Cross-Q. 284. Is that the best description you can give of its appearance?

Ans. Yes, sir.

Cross-Q. 285. You say that Mr. Draper, the owner of the farm on which Mr. Kissinger lived, and his daughter, were at Mr. Kissinger's house when you returned from the visit to your grandfather and other relatives; how long did they remain there at Mr. Kissinger's on that visit?

Ans. About a week or ten days, more or less; I can't just remember the time.

Cross-Q. 286. What was the name of Mr. Draper's daughter, to whom you refer?

Ans. Jennie.

Cross-Q. 287. About how old was she at that time in your judgment?

Ans. About twenty or twenty-one.

Cross-Q. 288. Do you remember anything that took place during that visit while the Drapers were there?

Ans. Nothing particular.

Cross-Q. 289. Do you remember where they went, or who came there to see them?

Ans. They visited some of the neighbors there, Alfred Seidel and Fenn; I don't know Fenn's first name exactly; they generally call him Squire Fenn; they visited other neighbors, as they generally did when there.

Cross-Q. 290. Was Mr. Draper's daughter ever up there before or afterwards, to your knowledge?

Ans. No, sir.

Cross-Q. 291. Was Mrs. Draper ever up there with her husband? If so, when?

Ans. No, sir.

Cross-Q. 292. You have testified in substance in answer 98 that Mr. Drawbaugh put the ram in at Kissinger's place about the fifth of November, 1878; do you know who brought the ram up there from Mr. Drawbaugh's shop?

Ans. I did not state that he put the ram in on the fifth.

(Mr. Hill replies "I did not say *on* the fifth; I said *about* the fifth.") Oh! I misunderstood you; I ain't exactly sure, but it runs in my mind that Mr. Kissinger drove to Eberly's mills and fetched Mr. Drawbaugh and the ram up on the fourth of November, when I was at Harrisburg.

Cross-Q. 293. Had you ever seen the ram there at Mr. Kissinger's place before Mr. Drawbaugh came up to put it in at that time?

Ans. No, sir.

Cross-Q. 294. Are you confident that the ram was put in immediately after it was delivered to Mr. Kissinger?

Ans. To the best of my knowledge it was.

Cross-Q. 295. Can you swear that the ram was not there at Mr. Kissinger's a long time before it was put in and started to running?

Ans. I can swear that I never saw it there.

Cross-Q. 296. Could it have been there a long time without you seeing it?

Ans. Not handy.

Cross-Q. 297. Explain what you mean.

Ans. It couldn't have been there without I would have knowed something about it.

Cross Q. 298. Do you feel as confident of that as of anything else you have testified to in this case?

Ans. Yes, sir.

Cross-Q. 299. How long did it take to bore the wooden pipes for the ram?

Ans. I don't know how long they worked at it.

Cross-Q. 300. Were they several summers in boring those pipes?

Ans. No, sir.

Cross-Q. 301. Did they ever bore any other wooden pipes in Mr. Kissinger's place while you lived there, except the pipes for that ram?

Ans. No, sir.

Cross-Q. 302. Did they commence boring those wooden pipes prior to the summer of 1878?

Ans. I don't quite understand you.

(Question repeated by examiner.)

That is *before* 1878. I didn't understand what he meant. Do you mean *before*?

Cross-Q. 303. Yes, I mean before. Did they commence boring those wooden pipes before the summer of 1878?

Ans. Yes, sir.

Cross-Q. 304. When did they commence boring them?

Ans. I don't remember just the date when they commenced.

Cross-Q. 305. Did they commence boring them before the 1st of January, 1878?

Ans. Yes, sir; I think they did.

Cross-Q. 306. Did they commence boring them before you lost your hat in the coal mine?

Ans. No, sir.

Cross-Q. 307. Did they commence boring them before the 1st day of September, 1877?

Ans. I couldn't say.

Cross-Q. 308. Did they commence boring them before the 1st day of May, 1877?

Ans. No, sir.

Cross-Q. 309. Are you as confident of that as of anything else you have testified to in this case?

Ans. Yes, sir; if I mistake not, it was during the winter of 1877.

Cross-Q. 310. Do you mean the winter between the 1st of January, 1877, and the 1st of April, 1877, or before the 1st of January, 1877?

Ans. I said it was the year of 1877—that winter. The pipe was laid in 1878, then.

Cross-Q. 311. Then you mean the winter of 1877–8, do you, and not the winter of 1876–7?

Ans. I said 1877. They commenced to lay them on the 4th of November, 1878.

Cross-Q. 312. The year 1877 had two winters, one at its beginning, and one at its end; which of those winters do you mean?

Ans. I mean the winter at the end of 1877.

Cross-Q. 313. Are you sure that they did not commence boring any wooden pipe on Mr. Kissinger's farm before that winter at the end of 1877?

Ans. I am, sir; that was the only pipe that was bored there while I lived there.

Cross-Q. 314. Do you mean during all the time you lived there from the latter part of 1875 until the spring of 1880?

Ans. Yes, sir.

Cross-Q. 315. What was the size of that wooden pipe, and the size of the bore?

Ans. I couldn't say just what the size of it was.

Cross-Q. 316. Did you see the pipe and the auger?

Ans. Yes, sir.

Cross-Q. 317. Then give us your best recollection of the size of the pipe and the bore.

Ans. I don't know whether I can give you that.

Cross-Q. 318. Haven't you any best recollection about it?

Ans. I don't just remember now.

Cross-Q. 319. Give your best recollection of the length of the auger.

Ans. I didn't work with it. I seen the auger there, and paid no more attention to it, more than that it was there, and they used it.

Cross-Q. 320. Give your best recollection of the length of the wooden pipe sections—I mean the separate pieces of wood which were bored, and which were afterwards put together to form the pipe.

Ans. I didn't pay particular attention how long they were.

Cross-Q. 321. Haven't you any best recollection on the subject?

Ans. About twelve or thirteen feet, as near as I can tell.

Cross-Q. 322. Did you examine the ram and pipe after they were put down?

Ans. No, sir. They were all filled in when I came long, but a little of the iron piping. I went to see the ram work.

Cross-Q. 323. What were they filled in with?

Ans. With ground that was dug out of the trenches.

Cross-Q. 324. Filled in from the house down to the ram?

Ans. It was filled in from the spring to the ram, and part of it from the ram to the house.

Cross-Q. 325. You mean that the pipe was filled in, or covered up with earth, from the spring down to the ram, and part way from the ram up to the house, do you?

Ans. I mean that it was covered up from the spring to the ram, and part of the trench was filled from the ram to the house. I don't know whether it was clear full, or not—the trench. There was some trouble with the pipe.

Cross-Q. 326. What was that trouble?

Ans. After they had the ram up, they started it, and they had left the water—didn't take the water out of the pipe—and it froze during the night, and busted one of the pipes. The pipe wasn't covered, the reason that it froze—or wasn't covered thick enough, I don't remember exactly how it was. I remember of helping to fill up the balance of the trench of the iron pipe; that is, from the ram to the house.

Cross-Q. 327. Did the iron pipe extend from the ram to the house?

Ans. Yes, sir.

Cross-Q. 328. Where was the wooden pipe put in—between the spring and the ram?

Ans. Yes, sir.

Cross-Q. 329. Was there any iron pipe between the spring and the ram—I mean in the pipe that carried the water from the spring to the ram?

Ans. I think there was one or two pieces, more or less.

Cross-Q. 330. How far was the ram from the spring?

Ans. About a hundred yards, as near as I can tell.

Cross-Q. 331. How far was the ram from the house?

Ans. About a hundred and fifty yards, more or less. I don't just remember.

Cross-Q. 332. Is the ram there yet in the same place?

Ans. Yes, sir.

Cross-Q. 333. How long were the sections of iron piping that were used there?

Ans. About twelve or thirteen feet, as near as I can tell.

Cross-Q. 334. Where did the pipe burst; between the spring and the ram, or between the ram and the house?

Ans. I understood Mr. Kissinger that it was between the ram and the house.

Cross-Q. 335. When it was discovered that the pipe had burst, what was done about it?

Ans. He unjointed it, and took it down to the Northern Central railroad shop, and got it soldered.

Cross-Q. 336. Who took it down to the Northern Central railroad shop to get it soldered?

Ans. Mr. Kissinger.

Cross-Q. 337. Who carried it back, after it was soldered?

Ans. He did.

Cross-Q. 338. Do you know who soldered it there at the railroad shop?

Ans. There was a neighbor of mine, who lives alongside of me, told me about a week ago that he soldered pipe for him when he put the ram in. I don't know whether that was the pipe, or not.

Cross-Q. 339. Name the neighbor.

Ans. James Nesbit.

Cross-Q. 340. Where did he tell you that—at his house or yours?

Ans. At my woodpile.

Cross-Q. 341. How came he to tell you—who started the subject, you or he?

Ans. He commenced it.

Cross-Q. 342. Are you sure of that?

Ans. Yes, sir.

Cross-Q. 343. Did you ever take any of that iron pipe from Kissinger's place to get it mended?

Ans. No, sir.

Cross-Q. 344. After that first bursting was there ever any trouble afterwards with the pipes bursting or leaking?

Ans. Not that I remember.

Cross-Q. 345. Is the wooden pipe still down there doing duty in connection with the ram?

Ans. It is still in yet.

Cross-Q. 346. Has none of that wooden nor iron pipe ever been taken up and new pipe substituted for it since it was first down?

Ans. Not that I know of.

Cross-Q. 347. If such a thing had been done before Mr. Kissinger moved away from the farm, would you have known it?

Ans. I think I would.

Cross-Q. 348. Is your wife still living?

Ans. Yes, sir.

Cross-Q. 349. Was she in a position to know as much about the history of that ram as you were?

Ans. I think so; she was there every day except when her and I was away, when they put it in.

Cross-Q. 350. Have you ever talked the history of it over with her?

Ans. Nothing more than when the time was that they commenced to work at it.

Cross-Q. 351. How many times have you talked on that subject with her?

Ans. Once or twice.

Cross-Q. 352. When last?

Ans. About two weeks ago, or a little longer.

Cross-Q. 353. Was this suit ever mentioned between you and her in that connection?

Ans. It was.

Cross-Q. 354. Did you forbid her to give any information to the parties whom I here represent?

Ans. No, sir; he was there in the house talking to both of us.

Cross-Q. 355. Who was there?

Ans. Mr. Daniel Drawbaugh.

Cross-Q. 356. When, and who was with him?

Ans. It was in the fall of 1880, as near as I can remember; he mentioned the name of the person who was with him, who didn't come in; I don't remember whether he said he was outside or was in the town, but some person was with him, and he was in a hurry; I don't remember the name.

Cross-Q. 357. That was before you had talked with anybody representing the Bell Telephone Company, was it not?

Ans. Yes, sir.

Cross-Q. 358. In that conversation with Drawbaugh was the ram mentioned, or only the telephone?

Ans. Only the telephone, if I remember right.

Cross-Q. 359. Now, referring to the ram, and the history of its being prepared for, put in, or operated, have you ever up to the present moment told your wife not to give any information about it? If so, when and why?

Ans. I have not.

Cross-Q. 360. Have you ever told her that in substance?

Ans. I never said anything to her about it, whether she should, or whether she shouldn't.

Cross-Q. 361. Have you ever directed or advised her not to answer questions about it, if anyone called to ask them?

Ans. I have not.

Cross-Q. 362. At the time when the ram was first put down, do you remember anything about any part of the ram or pipe being covered with straw?

Ans. They used straw and corn fodder to cover the ram part; and, I think, they used some on some of the pipe, before it was all covered up with dirt.

Cross-Q. 363. How long was the iron pipe there at Kissinger's place before the ram was put in?

Ans. About a week or ten days, as near as I can tell; it might have been two weeks.

Cross-Q. 364. Was that iron pipe which you hauled up from the railroad station as you have testified, all the iron pipe that was used in connection with that ram on that farm?

Ans. I don't know whether Mr. Drawbaugh fetched any with him with the ram or not.

Cross-Q. 365. If Mr. Drawbaugh did not fetch any with him with the ram, then was it all?

Ans. It was, as far as I know.

Cross-Q. 366. Where were you and what were you doing in the summer of 1876?

Ans. I worked for the Pennsylvania Railroad Company.

Cross-Q. 367. In what gang?

Ans. If I remember right I worked in the "floating-gang" that year.

Cross-Q. 368. Did you live at Mr. Kissinger's house on the farm that summer?

Ans. Yes, sir.

Cross-Q. 369. Did you get your meals at home?

Ans. Breakfast and supper I ate at home and my dinner I took with me.

Cross-Q. 370. At what hour were you accustomed to leave home in the morning for your work, and to return at night?

Ans. I left in the morning between five and six and would go home about six o'clock in the evening.

Cross-Q. 371. Do you remember of Mr. Kissinger's ever going down to Mr. Drawbaugh's shop at any time after the visit which he and Mr. Draper made there together?

Ans. I don't.

Cross-Q. 372. Don't you recollect of his ever going down there to hurry up the ram?

Ans. I don't; he might have been down, but I don't remember.

(Recess for lunch until 2, P. M.)

NOVEMBER 27, 1882.

Examination resumed pursuant to adjournment.

Present, Mr. Smith for complainants and Mr. Hill and Mr. Jacobs for respondents:

Cross-examination of J. C. Zimmerman, by Mr. Hill, continued.

Cross-Q. 373. Referring to the ram which was put in on Mr. Kissinger's farm; how long was the trench dug before the ram was put in?

Ans. I don't just remember; it wasn't very long, though.

Cross-Q. 374. Was it a month?

Ans. No, sir.

Cross-Q. 375. Was the pipe laid before or after the ram was put in?

Ans. I don't know, sir; they put it in the week I was away—me and my wife—the ram and the pipe.

Cross-Q. 376. Did they put in all the pipe that week?

Ans. Yes, sir; the ram was running when I came home.

Cross-Q. 377. I mean, didn't they put in any of the pipe before that week—iron or wooden pipe?

Ans. No, sir.

Cross-Q. 378. Then there was no pipe in at all before Drawbaugh came there on the 4th of November, was there?

Ans. There was not.

Cross-Q. 379. How long was it after the ram was put in before the pipe froze and burst?

Ans. I don't remember how many days it was.

Cross-Q. 380. Give us your best recollection.

Ans. I ain't sure; I think it was on Sunday night before I came home, and I came home on Monday.

Cross-Q. 381. When you came home you found the pipe had burst, did you?

Ans. Yes, sir.

Cross-Q. 382. Was the ram running when you came home, or had it stopped by reason of the bursting?

Ans. The ram was running; it must have been on Monday night, for the ram wouldn't have been running if it had bursted; the ram was running when I got home, for the water was running at the house when I drove up; I don't remember the exact date when it busted, but it had busted and gave trouble; it busted after I got home, for I fetched gas-pipe tongs to unjoint the pipe, when I came home from work.

Cross-Q. 383. From whom did you get those tongs?

Ans. From J. W. Beers, foreman of division No. 4.

Cross-Q. 384. After the pipe bursted, and put the ram out of order, how long did it remain in that condition before the pipe was soldered, and put back, and the ram put in working order again?

Ans. About one day. It might have been a day and a half.

Cross-Q. 385. Did any of that pipe ever burst afterwards?

Ans. Not while we lived there.

Cross-Q. 386. How deep was the trench in which the pipe was placed between the ram and the spring, and between the ram and the house?

Ans. Between two and three feet, as near as I can tell.

Cross-Q. 387. What portion of it was covered with earth before you returned from your visit?

Ans. The portion between the ram and the spring. There was some filled in the pipe from the ram to the house, but it wasn't finished.

Cross-Q. 388. At which end of the trench was this last-mentioned filling between the ram and the house?

Ans. They had filled it at different places along that portion of it.

Cross-Q. 389. Some up towards the house and some down towards the ram, and all along from point to point, do you mean?

Ans. It was; the most of it towards about the middle of it.

Cross-Q. 390. Where did the break occur; how far from the ram?

Ans. I don't know rightly, but I think it was at the lower end, near the ram; I ain't sure.

Cross-Q. 391. Do you know how many sections of pipe broke?

Ans. One.

Cross-Q. 392. Wasn't there more than one broke?

Ans. Mr. Kissinger told me there was one.

Cross-Q. 393. When did he tell you that?

Ans. In the morning before I went to work; he told me to ask whether they had pipe-tongs, and if they had, I should fetch them; that there was one joint of pipe broke.

Cross-Q. 394. You never knew of any other repairs to the ram or pipe except that repair of that broken section, did you?

Ans. Mr. Kissinger done a little fixing at the ram.

Cross Q. 395. Once, or more than once?

Ans. Oh, he tinkered around several times; I don't just remember how often.

Cross-Q. 396. Do you remember when or anywhere near when?

Ans. Through the summer of 1879. I don't know the particular dates when.

Cross-Q. 397. How do you fix it as being in the summer of 1879, that he tinkered it?

Ans. Because I only lived there one summer after the ram was put in.

Cross-Q. 398. Is the ram still running?

Ans. No, sir.

Cross-Q. 399. How long since did it stop running?

Ans. I don't know exactly how long. It never worked very well when the water was low.

Cross-Q. 400. Did it finally stop running before Mr. Kissinger moved away from the farm?

Ans. It run, but it didn't work very well; and after he left, it run down altogether.

Cross-Q. 401. It continued to be used as long as he lived there, did it not?

Ans. When the spring was high and the water was plenty we could use it, and when the water got a little low we couldn't very well. It wouldn't force the water up when the water was low.

Cross Q. 402. You have testified that you saw Daniel Drawbaugh up there at the time that the ram was put in; did you ever see him up there before that?

Ans. I ain't positive. It seems to me he was there once. I wouldn't say for sure, though.

Cross-Q. 403. Did you ever see him there after that—I mean after the time the ram was put in?

Ans. Not that I remember.

Cross-Q. 404. You have an impression of seeing him there before that time; how long before?

Ans. I couldn't say. I don't know whether he was, or whether he wasn't there. Therefore, I won't say.

Cross-Q. 405. Have you any impression as to what he was there for at that earlier time?

Ans. No, sir.

Cross Q. 406. You say you talked with Mr. Nesbit about the ram, about a week ago; was that the first and only time that you ever talked with him about it?

Ans. I think him and I talked about it once before.

Cross-Q. 407. When and where was that?

Ans. At my house; I can't just remember what time it was; it was since this suit was running.

Cross-Q. 408. Was it this summer or fall?

Ans. It was in the spring, I think, about the time Mr. Comfort and Mr. Storrow was to see me.

Cross-Q. 409. You have endeavored to fix the year 1878 as the time when that pipe was bored and the ram put in; now will you tell me just what you rely upon to fix that year instead of the year 1877, or the year 1876?

Ans. November, 1878, was the only time that I had my wife up to Landisburg after we moved to Marysville, and I lifted the pipe at the station for the ram in 1878; the book shows it.

Cross-Q. 410. Then you rely upon the books and the visit with your wife to your relatives near Landisburg as the means of fixing the date, do you?

Ans. Yes, sir; and we only lived there about eighteen months after that ram was put in.

Cross-Q. 411. You rely upon your memory for that last statement, do you not?

Ans. Yes, sir; it might have been a little longer, but as near as I can tell, it was about that long, the ram was put in in November, and we moved; the ram was put in in 1878, and we moved away in 1880, so you can count.

Cross-Q. 412. You rely entirely upon your memory to fix the time when you and your wife made the visit to your relatives near Landisburg, do you not?

Ans. Yes, sir; it was on the 5th of November, 1878.

Cross-Q. 413. You have already said that. I want to know if you have anything to prove the fact, except your own memory?

Ans. I have no writings to show for it.

Cross-Q. 414. You say that the visit of Mr. Draper and Mr. Kissinger to Mr. Drawbaugh's shop, to see about ordering the ram, was in the fall of 1877; have you anything, except your own memory, to rely upon in fixing that time?

Ans. No, sir.

Cross-Q. 415. You have testified in substance that the boring of wooden pipes was not commenced at Mr. Kissinger's place until after the year 1876; have you anything except you own memory to rely upon to fix that fact?

Ans. No, sir.

Cross-Q. 416. Your memory is just as reliable upon that last-mentioned point as upon any other point in the case, is it not?

Ans. I am *sure* about *that* point, for I never saw Mr. Draper till the year 1877, and the pipe was bored after he went away.

Cross-Q. 417. You rely entirely upon your memory for the fact that you never saw Mr. Draper till the year 1877, and for the fact that the pipe was not bored until after he went away, do you?

Ans. Yes, sir.

Cross-Q. 418. And you are as sure of those facts as of any other thing you have testified to, are you?

Ans. There was things asked me that I wasn't quite sure of, but I am sure of these now asked me.

Cross-Q. 419. You havn't sworn to anything that you were *surer* of than you are of these, have you?

Ans. I was sworn to tell the truth, and I did it as near as I possibly could on both sides of the question, as near as was in my power.

Cross-Q. 420. That doesn't answer my question. What I want to know is, whether you have testified to anything that you are surer of than you are of the two facts stated in your 416th answer?

Ans. I hardly know how to answer that question. I told him that I was sure of it.

Cross-Q. 421. At the time Mr. Draper visited Mr. Kissinger, and they went down together to order the ram, was anybody there visiting with him at Mr. Kissinger's?

Ans. I don't remember.

Cross-Q. 422. Do you remember of anybody's ever visiting with him, except that once when his daughter came with him?

Ans. Not that I remember.

Cross-Q. 423. When was the last time you ever saw Mr. Draper at Mr. Kissinger's?

Ans. When Mr. Kissinger had sale in the spring of 1880.

Cross-Q. 424. Did you ever see any of Mr. Kissinger's old neighbors, who lived at Eberly's Mills or near there, up visiting at the Kissinger family on the Draper farm near Marysville?

Ans. Yes, sir.

Cross-Q. 425. Who were they?

Ans. Mr. Calvin Hart and his wife, and there were several other families; I have forgotten their names.

Cross-Q. 426. Mention the names of all the families around the village of Eberly's Mills that you can think of, that lived there when Mr. Kissinger lived there.

Ans. Commencing at the upper end of the town, there was John B. Drawbaugh, George Drawbaugh, Daniel Drawbaugh, Daniel Fettrow, Amos Frownfelter, George Heck. On the other side of the street, was George Leonard, and a family living next to him—I have forgotten his name; Gardner—I don't know what his first name was; I have forgotten that—and a Smith—I ain't sure that I ever heard his first name; he went by the name of Smith, still. There was a man there by the name of Kahney—I don't know what his first name was; L. C. Steinberger, Calvin Hart. That was about all that just lived there in the town; then there was the farmers around; there were several other families that had moved there and moved away; I don't just remember their names.

Cross-Q. 427. Did you ever see any of these people whose names you have mentioned visiting socially at Mr. Kissinger's house, while he lived on the Draper farm; if so, please to mention the persons?

Ans. I mentioned Mr. Hart; there was another man and his wife who used to come, a farmer living near there whose name I can't recollect, who used to visit there; those were the only two families that I remember that visited there.

Cross-Q. 428. Describe his farm, so that we can ascertain what farmer it was, if possible.

Ans. His farm lay right across the dam, near Mr. Hart's store; I don't know his name; maybe Mr. Drawbaugh would be kind enough to tell me his name.

(Mr. Drawbaugh suggests that it was "Gilbert." Witness continues:)

Yes, that is the name.

Cross-Q. 429. Was there a good deal of fruit produced on the Draper farm which Mr. Kissinger occupied?

Ans. Yes, sir.

Cross-Q. 430. A good many cherries and peaches?

Ans. Yes, sir.

Cross-Q. 431. Do you remember any of his old neighbors whose names you have mentioned, going up there in the fruit season to get cherries and peaches? If so, who were they?

Ans. None but the two families I have mentioned that I remember of.

Re-direct by Mr. Smith:

(*Complainants' counsel requests the examiner to note that the account book referred to by the witness in answer to interrogatories* 48 *and* 69, *and from which extracts were made, is not the book referred to and produced in answer to interrogatory* 210, *and from which also extracts were made. The examiner so certifies.*)

(*Complainant's counsel also offers in evidence a certificate of Thomas R. Davis, Auditor of Disbursements in the Accounting Department of the Pennsylvania Railroad Company, showing the time returned to that office of the labor of the witness J. C. Zimmerman in the month of November,* 1878, *and requests that the same be inserted at this place in the deposition.*)

[*Objected to by Mr. Hill as incompetent.*]

The certificate is as follows:

"Accounting Department, Pennsylvania Railroad Company,
Office of Auditor of Disbursements,
233 South Fourth Street,
Philadelphia, *Nov. 27th*, 1882.

Thos. R. Davis,
Auditor of Disbursements.
J. D. Greene,
Assis't Auditor of Disbursements.

This is to certify that J. W. Beers, foreman of laborers on the Middle Division of the P. R. R. and Maintenance of Way Dept., sub Div. 4, Check & Pay Roll Nos. 2520 has returned the time of J. C. Zimmerman, laborer, for the month of November, 1878, as follows: Days worked: 1st, 3rd, 10th, 13, 14, 15, 16 & 17, 21, 22, 23, 24, 25, 26, 27, 28, 29, & 30th; 180 hours at 10 c., $18.00.

No time was returned for the 2d, 4, 5, 6, 7, 8, & 9, 11, 12, 18, 19, & 20th of Novr., 1878.

Thos. R. Davis,
Aud. & Dist."

Q. Q. 432. In your answer to the 28th interrogatory, you stated that on the 5th of November, 1878, your wife and you started away on a visit within about a mile of Landisburg, and were away about one week; at the time when you answered that question, had you seen the certificate which I have just produced, showing the days in November, 1878, when you were at work for the Pennsylvania Railroad Company, or had you obtained from any of the officers or records of that company, any information as to specific days in November, 1878, when you were at work for the company?

(*All testimony based upon the certificate or referring to or adopting it as competent evidence in this cause, objected to by Mr. Hill, because the certificate itself is incompetent; and it not being sworn evidence nor a certificate authorized by law to take the place of sworn evidence; and the railroad official not being produced for cross-examination; and the same objection is made to the certificate of Mr. King that follows question 83, and to all questions that may refer thereto; and the contents of both certificates are further objected to as hearsay.*)

Ans. I had not.

Q. Q. 433. While you lived at Eberley's Mills or near there, did you perform any duty at the funeral of one of Mr. Daniel Drawbaugh's children; if so, what was it?

Ans. I was a bearer at the funeral of his daughter.

Q. Q. 434. Did you go to his house on that occasion?

Ans. Yes, sir.

Q. Q. 435. Where you ever there at other times?

Ans. Not in his house, that I remember.

Q. Q. 436. Do you remember what was the appearance of his furniture and the furnishings of his house, so far as you saw it, as compared with the houses of his neighbors?

[*Objected to as new matter, not referred to in the cross-examination; and, also, as irrelevant and immaterial, and a matter of mere opinion, and for which there is not even a basis of comparison, as the style of the neighbors' housefurnishing is not in evidence.*]

Ans. Everything was nice and tidy, and the furniture, so far as I seen, was as good as that of any of his neighbors.

Q. Q. 437. Were you accostomed to see his children?

[*Same objection.*]

Ans. Yes, sir.

Q. Q. 438. Were they comfortably dressed?

[*Same objection.*]

Ans. Yes, sir.

Q. Q. 439. How did their dress compare with that of the other children you were accustomed to see?

[*Same objection.*]

Ans. As good as the rest of the folks that lived around there?

Q. Q. 440. Were you accustomed to see Mrs. Drawbaugh from time to time? If so, what was her appearance as respected dress in comparison with her neighbors.

[*Same objection.*]

Ans. She was always respectably dressed, about as good as her neighbors generally.

Without waiving the objection, re-cross-examination *de bene esse* by Mr. Hill:

Re-cross-Q. 441. Is it not the custom around Eberly's mills, as it is elsewhere around the country, to borrow the neighbors' furniture and fix the house up extra nice on the occasion of funerals and other unusually large gatherings?

Ans. I don't know whether they borrow furniture or not.

Re-cross-Q. 442. And you don't know whether that furniture which you saw at Drawbaugh's house belonged to him or not, do you?

Ans. I couldn't say whether it was his, or whether he borrowed it; I seen it there.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 27th day of November, 1882.
FRED. M. OTT,
Examiner.

J. C. ZIMMERMAN.

Adjourned until 7.30, P. M.

NOVEMBER 27, 1882, 7.30, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

CYRUS BOWMAN, *being produced, sworn, and examined, saith:*

Examined by Mr. Smith:

My age is fifty-three; residence, Mongul, Franklin county, Penna.; occupation, miller.

Q. 1. Did you ever live at Eberly's Mills; if so, when did you go there to live, and when did you move away?

Ans. Yes, sir; I lived there; I moved there on April 1, 1874; I moved away March 1, 1876.

Q. 2. How came you to go there?

Ans. It was through John Drawbaugh that I got there.

Q. 3. What was your business while you were there?

Ans. The milling business.

Q. 4. Whose mill did you run?

Ans. Mr. Leonard's; I think his full name was George Leonard.

Q. 5. What was your arrangement with Mr. Leonard for running the mill; on what terms did you run it?

Ans. We bought the grain in partnership, and the half of the profits were his and the other half mine; the toll, he got the two thirds and I got the one third of.

Q. 6. Who was to pay for the repairs on the mill, or the mill-wright work that was necessary while you were running the mill?

Ans. George Leonard.

Q. 7. Did you have to bear any part of the expense of such repairs or mill-wright work?

Ans. No, sir.

Q. 8. Did your brother, George H. Bowman, work in the mill the last month that you were there, February, 1876?

Ans. Yes, sir.

Q. 9. For whom did he work, for you or for Mr. Leonard?

Ans. He worked for me.

Q. 10. What was he employed to do, what was his work?

Ans. His work was milling at the mill.

Q. 11. Who paid him for his work?

Ans. I paid him.

Q. 12. Did you know of Mr. Leonard employing him to do anything or paying him anything?

Ans. No, sir; I didn't.

Q. 13. Did he do any mill-wright work while he was there, to your knowledge?

Ans. Not that I can recollect.

Q. 14. If he had done any mill-wright work of any consequence, do you think you would have known it and remembered it?

[*Objected to by Mr. Hill, as calling for mere opinion.*]

Ans. He might have done a little mill-wright work, but if he did I don't remember it.

Q. 15. Do you remember that you paid him for his work at milling; and whether you paid him for all the time he was there?

Ans. I paid him as near as I can tell, fifteen dollars for the time he was there.

Q. 16. Did he board with you while he was there?

Ans. Yes, sir.

Q. 17. In what house did you live?

Ans. I lived in a white house that is called the "mill-house."

Q. 18. Did you know Daniel Drawbaugh while you lived there?

Ans. Yes, sir.

Q. 19. Had you known him before you went there to live?

Ans. I had saw him before, but had no acquaintance with him.

Q. 20. State whether or not you saw him frequently while you lived there?

Ans. Yes, sir.

Q. 21. State whether or not he was accustomed to come to your mill and whether or not you were accustomed to go to his shop, more or less?

Ans. Yes, sir; he was accustomed to come to the mill, and I would occasionally go down to his shop, too.

Q. 22. Did he trade with you while you lived there? If so, what did he buy?

Ans. Yes, sir. He would buy flour and feed.

Q. 23. Did he come to the mill himself to make his purchases, or did some other person come there for him?

Ans. He would mostly come himself.

Q. 24. Did he pay cash for what he bought, or buy on credit?

Ans. He paid cash for some, and some on credit?

Q. 25. State whether, or not, you ever hesitated to give him credit when he wanted it?

[*Objected to by Mr. Hill, as immaterial.*]

Ans. No, sir.

Q. 26. When you went away, or before you went away, did he pay for all he had bought on credit?

Ans. The book shows so.

Q. 27. Will you look at the book which I now show you, and state whether it is the book which you kept for your credit business while you were running the mill; and, if so, will you state whether it contains Daniel Drawbaugh's account, and on what pages?

Ans. Yes, sir; it is the book; it contains Daniel Drawbaugh's account on pages 88 and 119.

Q. 28. In whose handwriting is this account?

Ans. It is my hand.

Q. 29. Will you read the heading of the account, or show it to the examiner to copy—on the first page?

Ans. "1864. Daniel Drawbaugh, Dr. Cr.
Jane 19."

Q. 30. How came the date of this account to be 1864.

Ans. It was a mistake.

(*Counsel for respondents admit that the date is an apparent mistake, and that it should be 1874.*)

Q. 31. What is the date of the first item—what month and day—in this account?

Ans. June 19.

Q. 32. Will you hand the book to the examiner to copy the account as part of your deposition?

Ans. Yes, sir; here it is: (The account is as follows, page 88:)

"Daniel Drawbaugh,		Dr.	Cr.
June	19, to 1–16 sack flour,	$0 50	
July	1, " 1–8 " flour,	1 00	
"	13, " 1–8 " "	1 00	
Aug.	7, " 1–8 " "	95	
"	17, " 1–16 " "	50	
Sep.	1, " 1–8 " "	90	
"	18, " 1–8 " "	90	
"	30, " 1–8 " "	90	
Oct.	10, " 1–4 bush. corn meal,	25	
"	12, by cash,		25
Dec.	17, to 1–16 sack flour,	40	
"	19, by cash,		40
Jan.	5, to 1–8 sack flour,	80	
"	12, to 1–16 sack flour,	40	
"	13, to 1–4 bush. corn meal,	25	
"	22, to 1–8 sack flour,	80	
"	20, to 1–8 sack flour,	80	
Feb.	4, to 1–8 " flour,	80	
March	17, to 1 bush. chop,	50	
"	18, to 1–8 sack flour,	75	
"	22, to 1–4 bush. corn meal,	25	
April	1, to 1–8 sack flour,	75	
"	8, by cash,		65
"	9, to 1–4 corn meal,	25	
	To page 119, $12 35,	13 65	1 30"

Page 119 is as follows:

"119. Daniel Drawbaugh,		Dr.	Cr.
Transport from page 88,		$12 35	
April	21, to 1 bush. shorts,	54	
"	22, to 1–8 sack flour,	75	
"	27, to 1–4 bush. cornmeal,	25	
"	" to 1–2 " shorts,	25	
"	29, to 1–8 sack flour,	75	
"	30, to 1 bush. chop & shorts,	70	

May	6,	to 1–8 sack flour,	$0 75
“	7,	to 1 bush. shorts,	54
“	21,	to 1 “ chop,	52
“	“	to 1–16 sack flour,	40
“	27,	to 1 bush. stuf,	54
“	28,	to 1–8 sack flour,	80
June	2,	to 1 bush. shorts,	54
“	“	to 1–8 sack flour,	80
“	9,	to 1–8 “ flour,	80
“	“	to 1–2 shorts,	18
“	12,	to 1 bush. chop,	70
“	16,	to 1–8 sack flour,	80
“	19,	to 1 bush. chop,	75
“	25,	“ 1–8 sack flour,	80
“		to 1 bush shorts,	54
July	1,	to 1–16 sack flour,	40
“	2,	“ 1–8 sack flour,	80
“	3,	“ 1 bush. shorts,	54
“	8,	“ 1–8 sack flour,	80
“	10,	“ 1 bush. shorts,	54
“	14,	“ 1–4 “ crack corn,	20
“	15,	“ 1 bush. shorts & chop,	52
“	16,	“ 1–8 sack flour,	80
“	21,	1 bush. bran & chop,	52
“	“	1–8 sack flour,	80
“	26,	1 bush. shorts,	54
“	31,	“ 1 sack flour,	80
“	31,	“ 1, 1–2 bush. shorts,	54
Aug.	2,	“ 1–6 bush. crack corn,	11
“	5,	“ 1–4 sack flour,	1 60
“	6,	“ 1 bush. shorts,	54
“	“	“ 1–16 “ corn & bran,	11
“	10,	“ 1 “ shorts,	52
“	14,	“ 1–2 “ chop,	35
“	17,	“ 1–2 “ shorts, white,	30
“	19,	“ 1–8 sack flour,	1 60
“	31,	“ 1–6 sack flour, brown,	40
Sept.	4,	“ 1 bush. screanings,	65
			$39 03

"	9,	By cash,	$10 00
Dec.	20,	"	14 10
"	31,	" to Leonard,	14 93
			$39 03"

Q. 33. State whether or not these various purchases were made mostly or wholly by Mr. Drawbaugh himself at your mill?

Ans. Mostly by Mr. Drawbaugh.

Q. 34. Did you keep your cash sales in this book, or in a separate book?

Ans. A separate book.

Q. 35. In keeping that account, did you record the names of the persons making the purchase, or only the fact of the cash sale?

Ans. Part persons, and part not.

Q. 36. When you commenced keeping it, did you record the names of persons, or merely mention the fact of a cash sale, and if so, when did you commence recording the names of the purchasers?

Ans. I began the account without names, and begun recording names November 2, 1874.

Q. 37. Will you hand the book to the examiner to copy the record of sales to Daniel Drawbaugh?

Ans. Yes, sir; here it is.

(The account shows the following sales to Daniel Drawbaugh:)

"1875.			
Jan.	26,	Drawbaugh, oats,	$0 08
1874.			
Nov.	10,	Drawbaugh, 1–6 corn meal,	12
"	20,	D. Drawbaugh, 1–8 sack corn meal,	25
1874.			
Jan.	29,	Drawbaugh, 1–2 shorts,	37
1875.			
Feb.	10,	Drawbaugh, 1–8 flour,	80
"	26,	Drawbaugh, 1–2 shorts,	37
Nov.	24,	D. Drawbaugh, 1 bus. chop in ear,	40
"	27,	Drawbaugh, 1–6 corn meal,	12
Apr.	8,	D. Drawbaugh, 1 bus. chop,	60
"	16,	Drawbaugh, 1–8 corn meal,	25
		" 4 chop,	2 40
	13,	" 1 shorts,	75
	15,	D. Drawbaugh, 1 bus. shorts,	35

	17,	D. Drawbaugh, 3 bus. bran,	$0 90
	" "	" 2 " shorts,	60
	" "	" 6 " shorts,	2 47
May	21,	Drawbaugh, 3 bus. bean,	90
June	7,	D. Drawbaugh, crack corn,	10
"	19,	D. Drawbaugh, 1 bus. shorts,	54
July	6,	Drawbaugh, crack corn,	10
Aug.	28,	D. Drawbaugh, 1 bus. chop,	70
Sept.	9,	D. Drawbaugh, cash,	10 00
Nov.	12,	D. Drawbaugh, 1-8 sack flour,	80
"	20,	" " 1-8 "	80
Dec.	4,	" " 1-8 "	80
"	10,	" " 1-8 "	80
"	19,	" " Cash,	40
"	25,	" " 1-8 sack flour,	65
1875.			
Feb.	26,	Drawbaugh, 1-8 flour, 1-8 corn,	1 00
March	24,	D. Drawbaugh, 1-8 sack flour,	75
April	8,	" " cash,	65"

Q. 38. Did you keep your cash sales of feed on the same pages with your cash sales of flour; if not, will you point out the pages on which you entered your cash sales of feed?

Ans. According to this book, the feed was kept separate from the flour.

(Witness shows book to examiner.)

Adjourned until November 28, 1882, at 9.30, A. M.

NOVEMBER 28, 1882.

Examination resumed pursuant to adjournment.

Present, same counsel.

Examination of Cyrus Bowman by Mr. Smith, continued:

Q. 39. I noticed in your cash book there are accounts of sales to D. Drawbaugh, G. Drawbaugh, J. B. Drawbaugh, H. K. Drawbaugh, and some which are simply "Drawbaugh;" and that those which are marked "Drawbaugh" simply are included in the list which the examiner has made; are you able to say whether these sales, which are made to Drawbaugh simply, were made to Daniel, or to some of the other parties of that name?

Ans. As near as I can say, they belong to Daniel Drawbaugh—those accounts that are just "Drawbaugh."

Q. 40. Is there another page in your account-book showing charges to Daniel Drawbaugh. If so, will you look at the account, and state whether it is in your handwriting; and whether, or not, you know anything about the sales?

Ans. There is another page containing some charges, but I know nothing about them, and the entries are not in my handwriting.

[The charges referred to are on a page having no number, and consist of six charges, amounting to $7.43, purporting to be in January, February, and March, 1876, and are marked paid.]

Q. 41. You have said, I believe, that while you lived at Eberly's mills you occasionally went down to Drawbaugh's shop; did you go there on business, or to talk to him and other people who might be there?

Ans. Sometimes I would go on business, and sometimes I would go down just to see him.

Q. 42. Was his shop a place to which the neighbors were apt to resort for the purpose of seeing each other?

(*Objected to by Mr. Hill, as leading.*)

Ans. Yes, sir; the neighbors would frequently go down to see him and his machinery.

Q. 43. Did you ever take friends of yours to his shop to see what he had, or send them there for that purpose?

Ans. Yes, sir.

Q. 44. Do you remember what business was carried on there at the shop while you lived there, and what parties were concerned in it?

Ans. When I first went there, they were working at the faucets. I think it was carried on by Hauck. I forget his name now. Afterwards they were making axles. This was carried on by Moore, Grove & Co. I can't remember the other names.

Q. 45. Aside from the machinery employed in the faucet and axle business, did you see any machinery or inventions of Mr. Drawbaugh's? If so, will you state what you remember seeing?

Ans. I seen, for instance, the clock. Mr. Drawbaugh showed me about the clock—how it worked. He told me that he had made it. He showed me a wire that run from the clock down to the ground. I had seen a kind of a bell-machine, and I don't remember of any more that

I saw, except a nail-cutter. He had a nail-cutter there. I can't remember of any more.

Q. 46. State whether or not you saw any talking machines while you lived at Eberly's Mills, or heard Mr. Drawbaugh or anyone else say anything about such a machine?

Ans. No, sir; I did't see anything of the kind, nor I didn't hear Mr. Drawbaugh say anything of the kind, nor anybody else.

Q. 47. Will you state whether or not Mr. Drawbaugh came to see you some time ago, and if so, when and where he came to see you, and what inquiry, if any, he made of you?

(Objected to by Mr. Hill, as not in rebuttal of anything introduced by the respondents.)

Ans. He came to see me, I think it was last May or June a year ago, as near as I can tell. He came to the place where I lived, Mongul, Franklin county. He came into the mill, and he had a box along with him, he opened the box and took out some patterns or machinery of some kind. He asked me whether I had ever seen anything of the kind in his shop; he told me that he didn't know whether he had showed me those things or not when I was in his shop; I told him that I had never seen anything of the kind in the shop, nor he had ever said anything to me about it.

Q. 48. Did any one come with him at that time, and if so do you know who it was?

Ans. There was a gentleman with him, but I can't say who it was.

Q. 49. How long did Mr. Drawbaugh remain at the mill and do you know where he went when he went away?

Ans. He was perhaps about a half an hour at the mill. Afterwards he went along up with me to the house and talked to my wife a little while? and then went to Shippensburg, I suppose.

Q. 50. Will you look at the various instruments which are now on the table, and state whether you recognize any of them as being the instruments which Mr. Drawbaugh showed you?

Ans. He had something similar to "F" and "B," but I couldn't say that they were the ones; there weren't over about three or four pieces, I think, that he had on the desk.

Q. 51. State whether, or not, Mr. Drawbaugh asked you to study over the matter, and to send him word, if you ever remembered anything?

Ans. Yes, sir.

Q. 52. Did the gentleman who came with him come into the mill?

Ans. No, sir. He wasn't out of the buggy.

Q. 53. While you lived at Eberly's mills were you accustomed to see Mr. Drawbaugh's family? If so, what was their appearance as to their dress compared with that of their neighbors'?

(*Objected to by Mr. Hill, for the same reasons given in the objection to question 437, of J. C. Zimmerman's deposition in this case.*)

Ans. I saw their family pass, and re-pass, and at our house. Their appearance was about as good as anybody else it that place.

Q. 54. Were you ever in Mr. Drawbaugh's house?

Ans. Not that I can remember.

Q. 55. Do you remember whether you ever heard anything said among the neighbors about his house, or the way it was furnished; and, if so, what was the talk?

Ans. I heard my own family say that the house was well furnished.

Q. 56. Were the people of that neighborhood accustomed to come together in the evenings, especially on Saturday evenings, at the store, to talk over matters that had occured in the neighborhood?

(*Objected to by Mr. Hill, as immaterial and irrevelant.*)

Ans. Yes, sir.

Cross-examined by Mr. Hill.

Cross-Q. 57. You have referred to some accounts in your book as being marked simply "Drawbaugh." How do you know that those accounts related to Daniel Drawbaugh?

Ans. I mostly, when I sold anything, if it was J. B. Drawbaugh I would put "J. B. Drawbaugh," and so with the others, and when it was Dan., I sometimes just put "Drawbaugh." To the best of my knowledge it was Dan. Drawbaugh.

Cross-Q. 58. Then you wouldn't swear positively that it was Dan. Drawbaugh?

Ans. No, sir.

Cross-Q. 59. In your account with Daniel Drawbaugh I observe that the last item is as follows: "December 31, by cash to Leonard, 14.93." Do you remember how that happened to be charged in that way "by cash to Leonard?"

Ans. Not, unless it was paid to Leonard.

Cross-Q. 60. Didn't Leonard assume that sum in settlement with you, he settling it with Drawbaugh in some other way.

Ans. I can't remember anything about it. I only know what the book states there.

Cross-Q. 61. It has appeared in evidence in this case that Drawbaugh made some settlements with Leonard by giving Leonard his note at different times; how do you know but that this item of $14.93 was assumed by Leonard in his settlement with you, and was included in one of Drawbaugh's notes to Leonard?

Ans. I know nothing about their notes.

Cross-Q. 62. You have put in evidence copies from two of your account-books, to wit: The large credit-book and the small cash-book. In the latter appears the following item: "Sept. 9, D. Drawbaugh, cash, $10 00." Please look at your large credit-book, and state if that same payment is not credited therein?

Ans. This same credit here in the cash-book is credited in the credit-book. It was paid on this account in the credit-book, and was first put in the cash-book, and then taken off, and put into the credit-book.

Cross-Q. 63. Please look at the item, "Dec. 19, by cash 40," which appears in both books, and state whether or not that was one payment charged on both books?

Ans. Yes; that came off of the account—forty cents.

Cross-Q. 64. Please look at the item, "April 8, cash .65," and state whether that was not an item charged on both books?

Ans. Yes, sir.

Cross-Q. 65. On your credit account-book, does it not appear that a running account, running from June 19, 1874, to December 31, 1875, a period of over eighteen months, the cash payments made to you by Mr. Drawbaugh, on that account were as follows:

"Oct. 12, 1874, $0 25.
Dec. 19, 1874, $0 40.
April 8, 1875, $0 65.
Sept. 9, 1875, $10 00.
Dec. 20, 1875, $14 10.
Dec 31, 1875, $14 93 to Leonard?"

Ans. According to the book it does.

Cross-Q. 66. These account-books contain a large number of accounts with different people. Whose account-books are they?

Ans. They had belonged to me and Mr. Leonard; the credit book now belongs to Mr. Leonard; the cash book belongs to me.

Cross-Q. 67. How does it happen that the credit-book belongs to one man and the cash-book to another?

Ans. The cash-book was settled up between me and Leonard; there was some unsettled accounts in the credit-book and Leonard took the accounts and the book.

Cross-Q. 68. Do you mean, took them in settlement with you.

Ans. Yes, sir; took them in settlement with me.

Cross-Q. 69. In what name was the business of the mill carried on while you run it?

Ans. "Leonard & Bowman."

Cross-Q. 70. Who paid the workmen in the mill?

Ans. What do you mean by "workmen?" The miller do you mean?

Cross-Q. 71. Yes, sir.

Ans. I paid the miller.

Cross-Q. 72. Did you ever have to bring suit for the collection of any of the accounts on the mill books?

Ans. I believe one person, J. B. Drawbaugh.

Cross-Q. 73. Was the suit brought before a justice, or in the county court?

Ans. Before a justice.

Cross-Q. 74. What justice?

Ans. I can't tell you his name; he lived in Carlisle; I don't know whether he lives there now or not.

Cross-Q. 75. Did you ever have anything to do in any other suit before a justice in Carlisle?

Ans. In this mill matter; not that I can recollect.

Cross-Q. 76. Did you ever at any time in any matter?

Ans. I have had suits; yes.

Cross-Q. 77. Before a justice at Carlisle.

Ans. Drawbaugh's account, I think, was about the only one in Carlisle.

Cross-Q. 78. Did Mr. Leonard and you get flour, meal, feed, or other articles from the mill, while you were running it? I mean, get them for your respective families?

Ans. Yes, sir; we couldn't well do without flour.

Cross-Q. 79. If any such articles are charged to you on the books, or if there is any account there, in which you appear as debtor, will you please to point out where such matters appear?

Ans. I don't know as there is anything in this book, (the credit-book.) I think we had another book.

Cross-Q. 80. Another book for containing accounts between you and Leonard, or for containing accounts generally?

Ans. I can't remember.

Cross-Q. 81. Will you swear that there was any other book besides those two which you have produced here?

Ans. Not positively. It is so long that I have forgotton.

Cross-Q. 82. Would your account and Mr. Leonard's account appear in the same book, and if not, why not?

Ans. I can't remember, but we settled up every month all accounts.

Cross-Q. 83. Referring to the credit account-book which you have used here in giving your deposition, are there not ten pages of that account-book occupied exclusively with accounts against George Leonard, in which he is charged with materials, such as flour, feed, etc., furnished at the mill, and with work and grinding done at the mill, and do not some of those pages contain over fifty items to the page?

Ans. As near as I can remember this was flour and feed.

[*Objected to by Mr. Hill as irresponsive, and witness' attention is called to the nature of the question, which is repeated.*]

Witness continues: Yes, there are ten pages. I counted fifty-seven items on one page.

Cross-Q. 84. And that is not the page containing the most items; is it?

Ans. No, sir; there are some that have more.

Cross-Q. 85. If I understand you correctly, Mr. Leonard and you were engaged in partnership in the business of buying grain, grinding it at the mill, and disposing of the product; were you?

Ans. Yes, sir.

Cross-Q. 86. The mill was also used as a grist-mill for doing custom work for the neighbors, was it not?

Ans. Yes, sir.

Cross-Q. 87. Who run it as a grist-mill—you alone?

Ans. I had different hands.

Cross-Q. 88. Who paid those hands?

Ans. I did.

Cross-Q. 89. Was Mr. Leonard liable in any way for the wages of those hands, or did the hands look to you alone?

Ans. They looked to me alone; he was not liable to the hands for grist-mill purposes.

Cross-Q. 90. So far as the grist-mill business was concerned, you conducted that business for yourself and paid Mr. Leonard an agreed proportion of the tolls as rent, did you not?

Ans. I would better state how I had the mill; we bought the grain in partnership; Leonard got the half of the profit and I got the other half; the toll grain Leonard received two thirds and me one third.

Cross-Q. 91. You gave him two thirds of the toll for the use of the mill if I understand it, you paying the expenses of the mill; so far as it was run on custom work; am I correct?

Ans. It just depends on the meaning about "expenses." I paid no expenses concerning the millwright work; any millwright work that was to be done, Leonard was to pay that.

Cross-Q. 92. He was to pay that as the owner of the mill, I suppose; was he?

Ans. Yes, sir.

Cross-Q. 93. But the expenses of the wages of the millers who were employed on custom work you were to pay, as the tenant of the mill; were you?

Ans. Yes, sir.

Cross-Q. 94. Now, as to grinding the grain that you and Mr. Leonard bought in partnership, who paid the wages of the millers employed in grinding that grain?

Ans. I did.

Cross-Q. 95. Did you charge any of it against Mr. Leonard?

Ans. No, sir.

Cross-Q. 96. Was there any expense account of the mill kept?

Ans. Not in particular.

Cross-Q. 97. Mr. Leonard was to keep the mill in order and you were to be at the expense of running the mill, was that the idea?

Ans. Yes, sir.

Cross-Q. 98. Reference has been made to your brother George H. Bowman being employed at the mill in February 1876; and he has testified that he did some mill-wrighting work there; do you remember of his putting a mill-bush in there at one time?

Ans. I don't remember, but he might have repaired it or fixed it up.

Cross-Q. 99. Did you ever go to Drawbaugh's shop when you wanted to meet some neighbor, thinking that you might find him there.

Ans. I can't say. I might have.

Cross Q. 100. Do you know of anybody who ever did go there for such purpose?

Ans. Yes.

Cross-Q. 101. Who was it?

Ans. There was different persons came to see me from a distance. They would mostly all of them go down and see Mr. Drawbaugh and his shop before they would leave.

Cross-Q. 102. Because they were acquinted with him?

Ans. No, sir; I don't think they had any acquaintance with him, but because they knew he was an ingenious kind of a man.

Cross-Q. 103. Do you remember of anybody's ever going to Drawbaugh's shop for the purpose of seeing anybody there, except Drawbaugh? If so, who was it, and when?

Ans. I don't understand that right.

(Question repeated.)

Ans. I don't remember of any one.

Cross-Q. 104. Drawbaugh's shop was not a place of resort where the neighbors went for the purpose of seeing each other, but only where they went the same as they would go to your mill for the purpose of seeing a person employed there? Is not that a fact?

Ans. I suppose they went down to see the machinery.

Cross-Q. 105. It was not a place of resort for the neighbors to gossip, as the store was, for example?

Ans. No, sir; I don't think.

Cross-Q. 106. Did you understand at the time you lived there that Daniel Drawbaugh was a poor man?

Ans. No, sir; I didn't.

Cross-Q. 107. Did you understand anything about his pecuniary circumstances?

Ans. I didn't know much about his circumstances, but I knew that he owned a nice house and a blacksmith shop, when I moved there.

Cross-Q. 108. You didn't know about the encumbrances on that property; did you?

Ans. I had heard them talking about it; what I meant was, I heard the people talking about it.

Cross-Q. 109. Please state again all the machines that you remember of seeing at Drawbaugh's shop, while you lived there?

Ans. I seen the clock, the nail-cutter, and a bell-machine that he had, I don't know what he called it; that is all I can remember.

Cross-Q. 110. When did you move away from Eberly's Mills, and where did you move?

Ans. The first of March, 1876; I moved to Franklin county, four miles from Shippensburg.

Cross-Q. 111. How many different times can you remember being in Drawbaugh's shop while you lived there?

Ans. I can't remember; I have no idea.

Cross-Q. 112. Were you there in the year 1876?

Ans. Yes, sir; the beginning of it.

Cross-Q. 113. Well, if you remember the fact of being there in the beginning of that year, tell me what you were there for, and whom you saw there?

Ans. I understood you to say at Eberly's Mills.

(Mr. Hill replies: No, at Drawbaugh's shop.)

It is likely I was at Drawbaugh's shop in 1876.

Cross-Q. 114. But you don't know that you were; do you?

Ans. I couldn't positively say that I was.

Cross-Q. 115. Could you positively swear that you were in his shop in the year 1875 at any time?

Ans. Yes.

Cross-Q. 116. What were you there for then?

Ans. I can't tell you.

Cross-Q. 117. Whom did you see there then?

Ans. I seen the hands working there.

Cross-Q. 118. What were they doing?

Ans. They were working at the axles, I think.

Cross-Q. 119. Did you ever ask Drawbaugh to show you his new inventions; if so, when?

Ans. No, sir; I never asked him.

Cross-Q. 120. Then you only saw what happened to be lying around in the shop in sight, when you were there; is that the fact?

Ans. He had shown me several of his machineries of his own accord; I never asked him.

Recess for lunch until 2.30, P. M.

NOVEMBER 28, 1882, 2.30, P. M.

Examination resumed pursuant to adjournment.

Present, Mr. Storrow for complainants and Mr. Hill and Mr. Jacobs for respondents:

Cross-examination of Cyrus Bowman, by Mr. Hill, continued.

Cross-Q. 121. What did he show you of his own accord, and when did he show it?

Ans. He showed me the clock and the bell-machine, and explained some little about the nail-cutter. I think this was in 1875.

Cross-Q. 122. Where was the nail-cutter when he showed it to you?

Ans. It was in the lower part of the building.

Cross-Q. 123. Do you mean in the cellar?

Ans. I suppose you may say cellar; I can't say whether it was ground or floor; it was down in the lower part of the house.

Cross-Q. 124. How many stories were above it?

Ans. I think it was a three story building.

Cross-Q. 125. Then there were two stories above where the machine was; were there?

Ans. At that rate, yes.

Cross-Q. 126. Where was the clock?

Ans. The clock was in his room that he worked in mostly, on the second story.

Cross-Q. 127. Do you mean on the next floor above the nail machine, or on the second floor above the nail machine?

Ans. As near as I can tell it was on the first floor from the nail machine.

Cross-Q. 128. Was that floor divided off into several rooms? If so, how many?

Ans. There was one room where the clock was in, and then there was another small room besides that.

Cross-Q. 129. Will you take a sheet of paper and pencil and make a sketch showing in outline how that floor was divided?

Ans. It is pretty hard for me to do, as I didn't pay much attention. (Witness makes sketch.)

The lower part, *a*, is where the nail-cutter was. Here is where the room was on the second floor *b* where he had his clock and his bell-machine. Opposite that there was a small room, *c*. The balance of that room they had their machinery in. The upper floor, marked *d*, also had machinery in it. I am telling this as well as I understand it. If there is a mistake, I can't help it.

(Sketch offered in evidence by Mr. Hill, to be marked "Exhibit Bowman Sketch.")

Cross-Q. 130. Can you make a plan-view of the middle floor on which you saw the clock and the bell-machine, so as to show how the rooms were arranged on that floor.

Ans. I don't know whether I can make it, or not.

(Witness makes sketch, which Mr. Hill puts in evidence as "Exhibit Bowman Sketch, No. 2.")

This was the large room, *m*. A door goes in there at *n*. The dots outside are steps going up on the outside to the door *n*. There is a door at *o*. Here is where the clock was at *p*. Here is where he had his bell-machine on a work bench—here at *q*. This door (*r*) goes into the little room *s*. The balance is the room *t*, where the machinery was. I give you a sketch of this just as well as I know how. I haven't seen it since 1876.

Cross-Q. 131. What was in the little room *s*?

Ans. I don't mind of anything but a large clock, I think I saw in that little room.

Cross-Q. 132. What kind of a clock?

Ans. It was a large old fashioned clock.

Cross-Q. 133. Did it run by electricity?

Ans. No, sir; I don't think it was running at all.

Cross-Q. 134. Was there any other clock in that room *s*?

Ans. Not that I recollect.

Cross-Q. 135. How many clocks were in the room *m*?

Ans. One. That is all I can remember.

Cross-Q. 136. Was that the one that had the wires leading into the ground?

Ans. Yes, sir.

Cross-Q. 137. Was that clock fastened up against the wall or not. How was it supported?

Ans. I think it was fast against the wall.

Cross-Q. 138. Tell us all that you remember about its construction and appearance—I mean the clock that had the wires to it in the room *m*?

Ans. The clock just appeared to me like any other clock, only that there was a wire running from the ground up into the clock.

Cross-Q. 139. What sort of a machine was the bell-machine that you speak of as being in the same room as the clock?

Ans. I don't know anything about the bell-machine, only that he told me it was calculated for hotels. That is all I know about it.

Cross-Q. 140. Did it go by electricity?

Ans. I can't tell you how he worked it no more.

Cross-Q. 141. Did he tell you what use it would be in hotels?

Ans. Yes; he was telling about rooms. If you wanted anything in any room you would make an alarm.

Cross-Q. 142. Did he ever show you a machine for wrapping wire with thread, or did you ever see one there?

Ans. Not that I remember.

Cross-Q. 143. Did he ever show you any kind of a telegraph machine, or did you ever see one there?

Ans. Not that I remember.

Cross-Q. 144. Did he ever show you an electric fire alarm, or did you ever see one there?

Ans. No, sir; not that I remember.

Cross-Q. 145. Did he ever show you a galvanometer, or did you ever see one there?

Ans. No, sir; not that I remember.

Cross-Q. 146. Did he ever show you a barometer, or did you ever see one there?

Ans. He never showed me any that I remember of.

Cross-Q. 147. Did he ever show you an electric shocking machine, or did you ever see one there?

Ans. He never showed me any, but I sent to Philadelphia with him for one.

Cross-Q. 148 When did you send to Philadelphia?

Ans. I think it was in 1874, as near as I can tell.

Cross Q. 149. Do you mean that you sent by him to get you one?

Ans. Yes, sir.

Cross-Q. 150. Did he ever show you a machine or device for sewing carpet rags, or did you ever see one there?

Ans. I never seen one there, but I heard him talking about it.

Cross-Q. 151. What else did you see in that room besides the clock and the bell machine?

Ans. He had his tools in, some of his patterns, and some of his knicknacks that he was working.

Cross-Q 152. Do you know what the "knicknacks" were?

Ans. No, sir; he always had different machineries there that he was working at.

Cross Q. 153. And you didn't know what they were, did you?

Ans. No, sir; it would have been a little hard for a man to understand what they were.

Cross-Q. 154. Did you ever know of his having invented a tack machine?

Ans. What kind of a tack machine was it to be?

Cross-Q. 155. Any kind of tack machine; I don't mean the nail machine.

Ans. I didn't see anything of that kind.

Cross-Q. 156. Did you ever hear of anything of that kind?

Ans. Not that I remember.

Cross-Q. 157. Did you know of his having invented a mill-tram, or red-staff?

Ans. Yes, sir.

Cross-Q. 158. When did you hear of that?

Ans. I think in 1873.

Cross-Q. 159. Before you moved to Eberly's mills?

Ans. Yes, sir.

Cross-Q. 160. While you were there at Eberly's mills did you ever hear of his putting in hydraulic rams for people?

Ans. There was one at Eberly's mills there, and they told me that Dan Drawbaugh had put it in.

Cross-Q. 161. Did you ever hear of his putting in any other except that one, anywhere, at any time?

Ans. Yes, sir; I heard of his putting in different ones.

Cross-Q. 162. Before you lived there, or while you lived there, or since?

Ans. There had some been put in before I came there; I don't know whether he put any in after I was there or not.

Cross Q. 163. How soon after you moved to Eberly's mills did you see the electric clock there in his shop?

Ans. I think I saw it in 1874.

Cross-Q. 164. Mr. Daniel A. Hamacher has testified, printed pages 302–324, respondents' printed record, and is corroborated by John F. Rupp, pages 324–329, and by Robert J. Strong, pages 392–398, and S. S. Rupp, pages 596, 597; Mr. Hamacher states that at the beginning of February, 1876, he was teaching school at Frogtown school-house, Lower Allen township, and went, with quite a number of his scholars, on a visit one afternoon to Drawbaugh's shop, to see the magnetic clock and the speaking machine; did you know anything of that school expedition to Drawbaugh's shop?

Ans. No, sir; I didn't; some of our children was going to school.

Cross-Q. 165. At that Frogtown school?

Ans. No, sir; to the Gorgas school.

Re-direct by Mr. Storrow:

Q. Q. 166. You were asked in the 83rd cross-interrogatory about an account of George Leonard in your account-book, in which he is charged with material such as flour, feed, etc., and for work and grinding done at the mill; was that for material which he got for use in his family, or what was it for?

Ans. It was partnership flour and feed; he received the flour and feed and took it to Harrisburg; when he would take any out of the mill I would charge him with it; the half of it was mine and the other half his; afterwards, then, every month, we would settle up our accounts.

Re-cross by Mr. Hill:

Re-cross-Q. 167. How do you know that some of that flour, feed, etc., in that account charged to Leonard, was not used in his house. For example, take the two casks of flour that are charged to him August 2d, or the one cask of flour charged to him Feb. 10th, or the one cask of flour charged to him October 9th, how do you know that none of those were used by his family?

Ans. One thing, he never used flour by the cask in his own houses, that I remember; and there was very often neighbors around Milltown would come to Leonard and say, "I want a barrel of flour;" for instance he would say to me: "such and such a man wants a barrel of flour, charge me with it;" that is about the way it happened.

Re-cross-Q. 168. How do you know he was accustomed to get his flour by the sack, instead of by the cask?

Ans. If he had got it by the cask he would have had to haul it up; this way he carried it up.

Re-cross-Q. 169. Did he get his flour at the mill?

Ans. Yes, sir.

Re-cross-Q. 170. Take then the following charges in his account: "January 6th, to $\frac{1}{4}$ sack of flour $1.38; Jan. 28, $\frac{1}{8}$ sack of flour .75; Feb.

25, to 1/8 sack of flour .75; Oct. 9, 1/4 bushel corn meal .25; Dec. 24, to 1/4 sack flour, $1.38; July 31, to 1/8 sack flour, .90; May 7, to 1/4 sack flour, $2.00;" which I have picked at random out of his long accounts; can you swear that these items were not for flour and meal procured for his own family?

Ans. I couldn't swear to it; it is too long; but that was partnership flour: it is likely that Leonard got that flour for other folks around the mill there.

(Last clause of answer objected to by Mr. Hill, as not responsive.)

Re-Cross-Q. 171. Was there any business sign up, at the mill?

Ans. No, sir; not that I know of.

Re-Cross-Q. 172. Do these account books show anywhere the firm name "Leonard & Bowman?"

Ans. I can't say that they do; we never used the name much.

(Mr. Storrow asks the examiner to certify that the account of George Leonard for May, from which an item was taken in the cross-examination, foots up for that month $197.43; and that on the fifth contains a charge for one cask of flour; and on the sixth for one cask flour, 1-4 sack flour, 1-8 sack flour, one cask flour; seventh 1-8 sack flour, one cask flour, besides on each of those days, chop, corn, etc.)

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 28th day of November, 1882.
FRED. M. OTT,
Examiner.

CYRUS BOWMAN.

J. C. NESBIT, *being produced, sworn, and examined, saith:*

Examined by Mr. Storrow:

My age is forty-three; residence Lisburn, Cumberland county, Penna.; occupation, school teacher.

Q. 1. How long have you been engaged in teaching in Cumberland county, and what schools have you taught in?

Ans. From 1868, fourteen years, but then I have been away twice during that time and returned.

Q. 2. I show you a book entitled as follows: "1731, History of Cumberland County, Pennsylvania, with illustrations. By Rev. Conway P. Wing, D. D., and others. Philadelphia: James D. Scott, 439 Chestnut

St., 1879." And containing on the back of the title page the following: "Entered according to an Act of Congress, in the year 1879, by James D. Scott, in the office of the Librarian of Congress, at Washington, D. C.

Herald Printing Company. Carlisle, Pa."

I find, beginning on page 200 of that book, the history of Lower Allen Township, in said county, headed: "Lower Allen township, by J. C. Nesbit, Esq.;" are you the Mr. Nesbit there referred to?

Ans. I am; yes, sir.

Q. 3. How came you to write the history of Lower Allen township for this book?

Ans. Mr. Scott engaged me to write it.

Q. 4. This book appears to have been published in 1879; how long before that did you write the history of Lower Allen township?

Ans. I think it was the summer previous—the vacation previous—1878.

Q. 5. How long was your summer vacation; from what time to what time?

Ans. Six months. From the latter part of March to the first of September.

Q. 6. Where were you living and teaching then?

Ans. At Lisburn.

Q. 7. Was anybody associated with you in getting up this history of Lower Allen township; and, if so, who, and how was the principal part of the work divided between you?

Ans. Yes, sir. R. P. Hull, then living in Lisburn. We agreed that he would gather information concerning the township, and furnish me with it. I was to rewrite it then, and send it on to the *Herald* office for publication.

Q. 8. I call your attention to part of that history of Lower Allen township, on page 201, entitled: "Milltown, or Eberly's Mills," and which is as follows:

"Milltown, or Eberly's Mills. This village is located on Cedar run, one eighth of a mile from its confluence with the Yellow Breeches. It has 83 inhabitants, and is on a tract of land originally owned by a Mr. Thompson. It has fifteen houses one of which is of brick, two of stone, two rough cast and the remainder of wood. It has one church, one store, one blacksmith shop, one shoe shop and one machine shop. A merchant and grist-mill was built in 1817 by George Fahnestock, but has since been owned by Price & Emmert, Fleck, Eberly, Beetem, Leonard & May and Dillinger the present proprietors. It is on Cedar Run, has four sets of stones, once had an engine, which has, however, been abandoned, and has once been thoroughly remodeled. Near it is an old mill which must have been built in the last century, but has been converted into a dwelling house. What was once a clover mill has been remodeled and fitted up as a machine shop. The present proprietor, Daniel Drawbaugh, some years since formed a stock company for the manufacture of measuring faucets and rotary pumps and for a while the machinery was used for the purposes of this company, but finally the faucet machinery was removed to Mechanicsburg and the works were much reduced. They are now applied, under the care of Mr. Drawbaugh, to the manufacture of his patent electric clock which is a marvel of ingenuity, and promises to supercede all other clocks. They are said to be run by a turbine wheel of fifteen horse power and to be worth not less than $7,000."

Did you assist Mr. Hull in procuring the information for that article about Milltown, or were you with him when he procured the information?

Ans. I was with him.

Q. 9. Did you procure that information in the village of Milltown? If so, state how you went there, and where you and Mr. Hull started from on that occasion.

Ans. Yes, sir; Mr. Hull and I procured the information in the village of Milltown; we started from Lisburn on that occasion and walked.

Q. 10. Whom did you first go to see for information in Milltown?

Ans. Squire John Drawbaugh.

Q. 11. Whom did you next go to?

Ans. Old Mr. Hart on the hill.

Q. 12. Who told you to go to Mr. Hart?

Ans. Squire Drawbaugh referred us to him.

Q. 13. Whom and where did you next go to after you had left Mr. Hart?

Ans. To Daniel Drawbaugh's machine shop.

Q. 14. Did you see Daniel Drawbaugh on that occasion?

Ans. I did.

Q. 15. I observe that the last half of that article about Milltown is occupied with an account of the machine-shop of Daniel Drawbaugh, and the work carried on there: from whom did you and Mr. Hull obtain the information for that part of the article?

Ans. From Mr. Daniel Drawbaugh.

Q. 16. On the visit you have referred to, or at some other time?

Ans. On the visit I have referred to.

Q. 17. How long did you and Mr. Hull stay at Mr. Drawbaugh's shop on that visit?

Ans. About an hour.

Q. 18. During how much of that time were Mr. Hull and Mr. Drawbaugh together?

Ans. Mr. Hull and Mr. Drawbaugh were together the whole time.

Q. 19. During how much of the time were you with Mr. Drawbaugh?

Ans. About half that time, as near as I can tell.

Q. 20. How did you occupy yourself during the rest of the visit?

Ans. Looking at that electric clock, and viewing or examining machinery in the shop, and tools, etc.

Q. 21. Was anybody besides Mr. Drawbaugh working on electric clocks, and if so, who, and what was he doing?

Ans. There was a man working there—I think Squire Drawbaugh's son was working at cases for the electric clocks.

Q. 22. Did Mr. Drawbaugh know that you were obtaining information for the purpose of writing an article to go into this history of Cumberland county?

Ans. Yes, sir; Mr. Hull told him.

Q. 23. Did Mr. Hull write notes of what he learned that day from Mr. Drawbaugh and others about Milltown?

Ans. Yes, sir.

Q. 24. Please look at this paper now shown you, and state whose handwriting it is in and what it is.

Ans. It is Mr. Hull's handwriting—the writing which he did concerning Milltown and our trip that day.

Q. 25. When did Mr. Hull hand that paper to you?

Ans. When we arrived home, just before we separated that same day.

Q. 26. Was, or was not, the part of it which relates to Mr. Drawbaugh's shop written at his shop?

Ans. I am under the impression that it was. I went with him home, and he didn't write any on the way that I know of.

Q. 27. Did you stop anywhere on your way home, after leaving Mr. Drawbaugh's shop that day?

Ans. Yes, sir. We stopped to see Mr. Schell.

Q. 28. How long did you stop at Mr. Schell's?

Ans. Fifteen or twenty minutes, perhaps.

Q. 29. Did you afterwards write out an article for this Cumberland county history from those notes of Mr. Hull?

Ans. Yes, sir; from those notes.

Q. 30. What did you do with the article when you had written it out?

Ans. I sent it to the *Herald* office at Carlisle, where this history was being printed.

Q. 31. How soon after your visit did you write it out?

Ans. That same evening.

Q. 32. Did Mr. Drawbaugh tell you on that occasion or say in your hearing that he claimed to be the first inventor of the speaking telephone?

Ans. I have no recollection of it.

Q. 33. If he had told you on that visit that he was the first inventor of the electric speaking telephone, would you have mentioned that in in your history?

(Objected to by Mr. Hill, as calling for mere opinion, and hypothetical.)

Ans. I would.

Q. 34. Had your attention been attracted to the electric speaking telephone at that time by reading about it in the newspapers or otherwise?

Ans. I had noticed it in the newspapers previous to that time.

Q. 35. Is Mr. Hull dead; and if so, when did he die?

Ans. He is dead; he died, I think, in the month of April or May, in 1879.

Q. 36. Was this history of Lower Allen Township printed in this book exactly as you wrote it; or was it somewhat shortened and abridged?

Ans. It was abridged.

(Mr. Storrow puts in evidence the paper referred to by the witness, and marked "Exhibit Hull and Nesbit Manuscript." The examiner notes that it is in pencil neatly written, with some words crossed out and some interlineations, which are noted in the following copy. The words crossed out are put in brackets, and the words interlined are printed in italics; the paper is as follows:

"Milltown Eberly's Mills.

This village is located on Cedar Run $\frac{1}{8}$ mile from its confluence with Yellowbreeches & on road leading from Harrisburg to Brooks mill formerly (now Hakes) this village has a population of 83 & was settled early in the last century the first resident was a Mr. Thompson who purchased a tract of land from the Penn heirs there are 15 Houses in the village of the following character 1 Brick 2 Stone 2 Roughcast the bal frame & Weatherboarded [The avocations are Represented as follows 1 Black Smith 1 Shoemaker and 1 Machine shop] there is 1 *church* one store one blacksmith shop—one shoe shop & [one machine] one mill & one machine shop the *present* mill *a merchant & Grist mill* was built 1817 by Geo. Fahnestock who sold to Price & Emmett & they sold to Heck & he sold Christn. Eberly, Eberly sold ($\frac{1}{2}$) to Beetem & they sold to Jno. Leonard & He sold to May & Dellinger *the present owners* this mill is on Cedar Spring run from which it derives its power & runs four sett of stones was once remodled & an engine attached which was never utilized to any considerable extent & was finally removed a short Distance south of this mill stands an old mill building (now converted into a Dwelling house) which was built in the past century the date of"

The first page ends here. The second page is as follows:

"Milltown or Eberly's Mills Vilage

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the erection of which cannot be obtained. the machine shop located on cedar Run is an old [Mill] *clover mill* building refitted & Remodled for its present *use* by the present proprietor Danl. Drawbaugh who upon the invention of his measuring faucett & Rotary pump formed a stock Co. & started their manufacture there under the imediate Superintendens of Mr. Drawbaugh the work was continued for a no of years When the faucett machinery was removed to Mechanicsburg reducing the gross valuation of the machinery *at this place* several thousand Dollars, the present compliment of machinery consists of 3 engine lathes 1 milling machine 4 lathes 2 Drill presses 1 extra lathe chucks Drifting tools &c in connection with machinery for the manufacture of his (Drawbaughs) patent electric clock (to which all his time at present is devoted [and] & *which* is a marvel in its way *and bids fair to supersede all other clocks.*) the valuation of this machinery is represented to be $7000, and is run by a turbine Wheel 15 Horse power."

(*The statements contained in said paper are objected to by Mr.*

Hill as incompetent and hearsay, it not appearing whether any of the statements of that paper are the statements of Daniel Drawbaugh, and if any of them are, it not appearing which; it not appearing how far they are the mere opinions of Mr. Hull or some other person unknown, nor whether the paper was ever seen or read by Mr. Drawbaugh.)

Adjourned until Nov. 29, 1882, at 9:30, A. M.

NOVEMBER 29, 1882, 9.30, A. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Examination of J. C. Nesbit, by Mr. Storrow, continued.

Q. 37. You say that your school-term began about the first of September; had you completed writing this history before that? If so, was it a short time before or a long time before that? How long before was it?

Ans. As near as I can tell, it was three weeks before.

Q. 38. Had you known Mr. Daniel Drawbaugh personally, or been at his shop before the visit which you have described?

Ans. No, sir.

Q. 39. Had Mr. Hull known him, or been at his shop before this visit?

[*Objected to Mr. Hill, as calling for hearsay.*]

Ans. Mr. Hull knew him—was acquainted with him.

(Complainants' counsel puts in evidence the history referred to, and especially the passages and articles which have been copied into the record.]

[*Respondents' counsel makes the same objections as to the statements contained in said history, as to the statements contained in the exhibit "Hull & Nesbit Manuscript.*]

Cross-examined by Mr. Hill.

Cross-Q. 40. Do you mean that you finished your work on the history three weeks before your fall term commenced, or that you began it three weeks before that?

Ans. I mean that I finished it three weeks before that time, as near as I can tell.

Cross-Q. 41. Did you transmit the manuscript to the editor, Dr. Wing?

Ans. I sent it addressed to the *Herald* office, Carlisle.

Cross-Q. 42. By mail or express?

Ans. By mail.

Cross-Q. 43. Did you receive any written acknowledgment of its receipt at the *Herald* office?

Ans. I did not.

Cross-Q. 44. If I understand you, you had charge of preparing the history of Lower Allen township?

Ans. Yes, sir; Mr. Hull and I. I had Mr. Hull associated with me in writing up the history.

Cross-Q. 45. Did Mr. Hull associate you with him, or did you associate Mr. Hull with you, or were you both appointed jointly by the managers of the enterprise?

Ans. At my request, Mr. Scott engaged Mr. Hull to assist me.

Cross-Q. 46. Who is Mr. Scott, where does he live, and what had he to do with the enterprise?

Ans. I don't know his full name, but it is in the history. [Witness reads.] "James D. Scott, 439 Chestnut street, Philadelphia." I think he had the management of the enterprise—at least, in part. He solicited persons to write up the history in different parts of the country.

Cross-Q. 47. Where did Mr. Hull live at the time when that history was prepared?

Ans. In Lisburn, Cumberland county.

Cross-Q. 48. Did he continue to live there until his decease?

Ans. He did.

Cross-Q. 49. How long was it from the time when you were first employed to write this history until you finished it, and forwarded your manuscript to the *Herald* office?

Ans. As near as I can tell, about four weeks.

Cross-Q. 50. How long was Mr. Hill associated with you before you completed your work, and forwarded the manuscript to the *Herald* office?

Ans. The entire time, about four weeks from the beginning.

Cross-Q. 51. Did you forward the history of Lower Allen township to the *Herald* office in separate installments as fast as you completed portions of it, or did you wait until you had completed the whole of it and forward it all at once?

Ans. I recollect of forwarding but once; that was when I had it completed.

Cross-Q. 52. Do you think that was between the first and fifteenth of August, 1878?

Ans. As near as I can tell, that was about the time.

Cross-Q. 53 Then you would say that you were first employed in the work somewhere about the first of July, 1878, would you?

Ans. Yes, sir, to the best of my knowledge.

Cross-Q. 54. What part of the history did you first work up?

Ans. That part about home; Lisburn and that end of the township.

Cross-Q. 55. Did anybody assist you in that part of the work; if so, who?

Ans. Mr. Hull assisted me more or less all through.

Cross-Q. 56. Did anybody else assist you except Mr. Hull in any part of the work?

Ans. No one else assisted me in writing; Mr. Coble obtained information for Mr. Hull in the east end of the township, up the river.

Cross-Q. 56½. Who is Mr. Coble and where does he live?

Ans. He is a school teacher and lives at White Hill, Cumberland county, Pennsylvania; his name is Peter C. Coble.

Cross-Q. 57. What was Mr. Hull's business?

Ans. He was a clock and watch cleaner and repairer.

Cross-Q. 58. Do you know of anybody else besides Mr. Coble that assisted Mr. Hull on parts of the history? If so, who?

Ans. I do not know of any others.

Cross-Q. 59. Did you or Mr. Hull make any other trip to Milltown for the purpose of obtaining materials for that history, except the trip you have mentioned?

Ans. We did not make any other trip.

Cross-Q. 60. What time of day was it when you arrived at Daniel Drawbaugh's shop on that trip?

Ans. About ten o'clock in the morning.

Cross-Q. 61. Did you find Mr. Drawbaugh in the shop immediately on your arrival there?

Ans. We did.

Cross-Q. 62. Did you first have conversation with him in the presence of Mr. Hull?

Ans. No, sir; Mr. Hull spoke to him first and introduced me. I didn't know Mr. Drawbaugh. I had never seen him before.

Cross-Q. 63. I understand from your direct testimony that you were there about an hour, during which time you and Mr. Hull were conversing with Mr. Daniel Drawbaugh about a half an hour; and during about another half hour you were examining the place, while Mr. Hull remained with Mr. Drawbaugh conversing. Is my understanding correct?

Ans. Yes, sir.

Cross-Q. 64. The half hour during which you and Mr. Hull were together with Mr. Drawbaugh conversing, was the first half hour I suppose, wasn't it?

Ans. Yes, sir; the first half hour or so.

Cross-Q. 65. During the last half hour while you were examining the place and Mr. Hull and Mr. Drawbaugh were conversing by themselves, I suppose you do not know what the conversation was between them, do you?

Ans. I do not. I didn't hear it.

Cross-Q. 66. Then you do not know whether Mr. Hull correctly understood or correctly reported any matters communicated to him by Mr. Drawbaugh while they two were talking apart by themselves, do you?

Ans. I do not.

Cross-Q. 67. During the first half hour, while you, Mr. Hull and Mr. Drawbaugh were conversing together, was anything said on the subject of electric speaking telephones?

Ans. Not that I recollect of; the direct conversation was between Mr. Drawbaugh and Mr. Hull.

Cross-Q. 68. Do you mean by that that the direct conversation being between Mr. Drawbaugh and Mr. Hull, there might have been matters spoken of that you did not hear, or did not understand, or did not pay sufficient attention to, to remember?

Ans. There may have been; I depended entirely upon Mr. Hull for information, for he was to take notes and report.

Cross-Q. 69. Did he take any notes there in your presence?

Ans. He had his portfolio with him, but I can't say positively that I saw him write during the time that I was with him and Mr. Drawbaugh.

Cross-Q. 70. Referring to this manuscript, "Exhibit Hull & Nesbit Manuscript," do I understand you that it is in Mr. Hull's handwriting?

Ans. It is in Mr. Hull's handwriting.

Cross-Q. 71. How do you know it is?

Ans. I am perfectly familiar with his handwriting.

Cross-Q. 72. Where did you find this manuscript?

Ans. Mr. Hull handed it to me just before we separated when we arrived at home.

Cross-Q. 73. Have you kept it among your papers ever since?

Ans. No, sir.

Cross-Q. 74. Where has it been?

Ans. With Mrs. Hull. As soon as the history was written, it was returned to Mr. Hull.

Cross-Q. 75. Who found it among Mr. Hull's papers for the purposes of this case?

Ans. Mrs. Hull, Mr. Hull's widow gave it to Mr. Coble.

Cross-Q. 76. When was that?

Ans. Sometime during this last summer of 1882.

Cross-Q. 77. What did Mr. Coble do with it?

Ans. He delivered it, I think, to Mr. Comfort.

Cross-Q. 78. John C. Comfort?

Ans. Yes, sir.

Cross-Q. 79. Was John C. Comfort acting as detective or procurer of evidence for the Bell Company?

Ans. It is my impression that he is.

Cross-Q. 80. Have you had any interviews with him (Comfort) in regard to your testimony in this case?

Ans. I have not.

Cross-Q. 81. Whom have you talked to with regard to such matters?

Ans. I talked some to Mr. Storrow and Mr. Smith.

Cross-Q. 82. When were you first approached on the subject of what you knew of this matter?

Ans. Last summer; sometime during the summer of 1882.

Cross-Q. 83. Who approached you then on the subject?

Ans. Mr. Comfort told me it was likely I would be called upon some time.

Cross-Q. 84. What else did he tell you?

Ans. I don't think he told me anything else about it; just merely that I would be called upon to give evidence.

Cross-Q. 85. How did he know that you had any evidence to give?

Ans. He knew that I was connected with the writing of that history of Milltown.

Cross-Q. 86. Had he obtained the manuscript at that time?

Ans. He had.

Cross-Q. 87. How do you know?

Ans. I saw it at the Bolton House, Harrisburg.

Cross Q. 88. Was your interview with Mr. Comfort at the Bolton House?

Ans. Yes, sir.

Cross-Q. 89. How came you to be at the Bolton House at that time?

Ans. Mr. Comfort asked me to come over and stop there when I came to town.

Cross-Q. 90. Was it at the Bolton House that Mr. Comfort told you that you might be called upon to give testimony?

Ans. It was not.

Cross-Q. 91. Was it at the prior interview with him that you have referred to?

Ans. No, sir; it was on the day of the election, the seventh of this month (November, 1882,) at the polls in Lower Allen township.

Cross-Q. 92. When I asked you in question 84 what else Mr. Comfort told you, and you answered that you didn't think he told you anything else about it, just merely that you would be called upon to give evidence, which of the interviews with Comfort did you refer to?

Ans. The last one is the only time he told me that it was likely that I would be called upon to give evidence.

Cross-Q. 93. Then you had at least three interviews with Comfort, had you not, to wit: One on the 7th of November, 1882, when he told you you would probably be called upon to give evidence in this case; one at the Bolton House in the summer of 1882 when he showed you the manuscript, and one prior to that time when he asked you to come to the Bolton House?

(Question objected to by Mr. Storrow for the reason that the witness' statement was that he saw the manuscript at the Bolton House, and not that it was in Mr. Comfort's possession at the time, nor that Mr. Comfort showed it to him at the time.)

(Mr. Hill states that the question is based on the witness' answers to questions 86, 87, 88, and 89.)

Ans. Yes, sir; three interviews. One at my house; one at the Bolton House, where I saw the papers; and one at the polls on the 7th of November.

Cross-Q. 94. At the interview at the Bolton House, who showed you the papers that you refer to?

Ans. I think it was Mr. Storrow.

Cross-Q. 95. Was Mr. Comfort present at the time?

Ans. I am not certain whether he was present just at the time. He was there at the hotel, though.

Cross-Q. 96. Tell me all that Mr. Comfort said there at the hotel at that time.

Ans. He told me that Mr. Storrow desired to see me.

Cross-Q. 97. Is that all that he told you?

Ans. All that I can recall bearing upon the subject—the question.

Cross-Q. 98. Did he say anything about the manuscript that you have referred to?

Ans. Not that I recollect.

Cross-Q. 99. What made you think then that Mr. Comfort had procured the manuscript from Mr. Coble, if you did not see it in Comfort's hands, and had no conversation with Comfort about it?

Ans. Mr. Coble came to see me first concerning the manuscript, and told me he wanted it for Mr. Comfort.

Cross-Q. 100. In your 93d answer, you speak of seeing the "papers" at the Bolton House; what papers do you refer to?

Ans. All the manuscripts of the history of the township—all that were left.

Cross-Q. 101. You have stated that the "Exhibit Hull & Nesbit Manuscript" was given by Mrs. Hull to Mr. Coble, and you now say that Mr. Coble came to see you concerning the manuscripts, and told you he wanted them for Mr. Comfort; did you go to Mrs. Hull's house to examine the manuscripts left by her husband?

Ans. Mr. Coble came to me first, supposing that I had them. I sent him to Mrs. Hull, saying that I had none, but that she had them, if there were any preserved.

Cross-Q. 102. Then you never examined Mr. Hull's manuscripts after his death to see what manuscripts he had left relating to the history, or relating to Daniel Drawbaugh, did you?

Ans. That means, examined the papers to see what was in them, does it? No, sir; when these papers were sent over I went to see Mrs. Hull to ascertain whether there were any more papers than what she had delivered to Mr. Coble.

Cross-Q. 103. Do you mean after you saw the papers at the Bolton House?

Ans. Yes, sir.

Cross-Q. 104. Did anybody request you to go over to Mrs. Hull's to see whether she had any more papers than what she had delivered to Mr. Coble?

Ans. Yes, sir; Mr. Storrow requested me to see, and to get all the manuscripts that I could concerning Milltown and Mr. Drawbaugh.

Cross-Q. 105. How came Mr. Storrow to request you to do that; was there any talk of Mr. Hull's having left other papers relating to Milltown or Daniel Drawbaugh, besides the "Exhibit Hull and Nesbit Manuscript" which you have produced?

Ans. There was.

Cross-Q. 106. What was that talk?

Ans. Some person had been writing up individual biographies of persons, and I thought probably Mr. Drawbaugh's biography was with Mr. Hull's papers.

Cross-Q. 107. What person had been writing up individual biographies of persons, and why did you think Mr. Drawbaugh's biography might be found among Mr. Hull's papers?

Ans. Mr. Hamacher and Mr. Coble I know had written a few, and Mr. Hull I knew wrote Mr. Gorgas' biography.

Cross-Q. 108. What Mr. Hamacher do you refer to?

Ans. Mr. D. A. Hamacher, school teacher of Lower Allen.

Cross-Q. 109. Was Mr. Gorgas' biography published, if so, where?

Ans. It was published in some of the histories which have biographies in the back part of them.

Cross-Q. 110. Some of what histories?

Ans. Histories of Cumberland county.

Cross-Q. 111. Do you mean some of these histories by Rev. Conway D. Wing and others published by James D. Scott and an extract from which complainants have put in evidence here?

Ans. Yes, sir.

Cross-Q. 112. Is this book here, from which complainants have just put in evidence the extract, one of the books containing the biographies, or is it one of the books published without the biographies?

Ans. This is one published without the biographies; I don't see any in it.

Cross-Q. 113. Comparing the histories which were published with the biographies, and those which were published without the biographies, did they contain the same subject matter with the exception of the biographies, and were they published at the same time?

Ans. They contain the same subject matter except the biographies, and my impression is that they were published at the same time.

Cross-Q. 114. Do you own one of the histories?

Ans. I do.

Cross-Q. 115. When did you come into possession of it?

Ans. In the year 1879.

Cross-Q. 116. Does your copy of the book contain the biographies, or not?

Ans. It does not.

Cross-Q. 117. Do you know who has a copy that contains the biographies, or where one is to be found?

Ans. I think Mr. H. S. Mohler was one. He lives in Upper Allen township; his post office is Shepherdstown, Cumberland county.

Cross-Q. 118. How far does he live from Shepherdstown, and in what direction, and what is his business?

Ans. He lives about a mile north, and is a farmer.

Cross-Q. 119. Do you know whether that book contains a biography of Daniel Drawbaugh, of Eberly's Mills or Milltown?

Ans. I am not positive of that; the book contained biographies, and I suppose Daniel Drawbaugh's biography is in it.

Cross-Q. 120. Did the book contain biographies of every person in the county, or only of the more noted citizens?

Ans. Not of everybody; of only a few.

Cross-Q. 121. Give me as correct an idea as you can of how many biographies it contained.

Ans. There were five or six were written up from Lower Allen township by some person.

Cross-Q. 122. Were the biographies that were published in that book of persons from any particular locality or scattered all over the county of Cumberland?

Ans. I do not know; I noticed only those from Lower Allen; they were all I happened to notice or looked for.

Cross-Q. 123. Were they biographies of men in any particular business or profession, or of men taken generally without reference to any particular occupation?

Ans. I suppose they were prominent men, without reference to any particular calling.

Cross-Q. 124. What Mr. Gorgas was it whose biography was contained in the book?

Ans. William R. Gorgas.

Cross-Q. 125. You say Mr. Hull prepared Mr. Gorgas' biography, if I understand you?

Ans. Yes, sir.

Cross-Q. 126. Do you know of any other biographies that Mr. Hull prepared for that book?

Ans. I do not.

Cross-Q. 127. Do you know whether or not Mr. Hull had charge of the biographical part of that book, so far as it referred to Lower Allen township?

Ans. I do not think he had.

Cross-Q. 128. What made you, then, expect to find biographical manuscripts or materials relating to Daniel Drawbaugh, or Milltown, among the papers left by Mr. Hull at his decease?

Ans. Mr. Hull told me at one time that he had engaged to write Mr. Gorgas' biography and expected to get something for it, and I thought it likely that he might have written others.

Cross-Q. 129. Did you find among his papers any biographical materials so far as you examined them?

Ans. I found that of Mr. Gorgas.

Cross-Q. 130. Did you find any other?

Ans. I did not.

Cross-Q. 131. You didn't examine the Hull papers at any time after Mr. Hull's death before they had been through John C. Comfort's hands, did you?

Ans. I did not. I did not have them in my possession.

Cross-Q. 132. Then, of course, you don't know of your own knowledge whether Mr. Comfort found among them any biographical sketch of Mr. Daniel Drawbaugh, or any materials for preparing a biographical sketch of Mr. Daniel Drawbaugh, do you?

Ans. I do not.

Cross-Q. 133. How many Hull papers did you see at the Bolton House?

Ans. I am not positive of its number—a small roll of papers.

Cross-Q. 134. Did you read or examine the contents of all of them, at that time?

Ans. I merely looked over them; I didn't read all the contents of any of them.

Cross-Q. 135. Referring again to the interview which you and Mr.

Hull had with Mr. Daniel Drawbaugh at his shop, state everything that you remember of Mr. Drawbaugh's saying during that interview.

Ans. We first went in where they were making cases for clocks, where we met Mr. Drawbaugh, and after talking a few moments, he told us about the clock, and about the cases, and that he had sold a few. We went on through the upper part of his shop then, and he spoke of his machinery and the number of lathes and tools; he spoke of the machinery being more extensive at one time, but part of it had been moved to Mechanicsburg. In regard to the clock, he told us that he had it connected with the earth; that it drew electricity from the earth. I believe that is all I can recall at this present time.

Cross-Q. 136. How do you fix the time of Mr. Hull's death?

Ans. His death occurred just before our school closed that year, and school closed that year in May.

Cross-Q 137. Where was he buried: in what burying-ground?

Ans. In the Lisburn; there is but one burying-ground there.

Cross-Q. 138. Will you please look at the paper which I now hand you and state in whose handwriting it is, if you know?

Ans. I would say it was Mr. Hull's.

Cross-Q. 139. Do you mean the handwriting of Mr. R. P. Hull, the gentleman to whom you have been referring in your testimony?

Ans. I do.

(*Respondents' counsel requests the examiner to insert at this point a copy of said paper in the same manner that the copy of the paper "Exhibit Hull & Nesbit Manuscript" was inserted, and respondents' counsel puts the paper in evidence as "Exhibit Hull Manuscript."*)

(Respondents' counsel requests the examiner to certify on the record that the two sheets, to wit: "Exhibit Hull & Nesbit Manuscript" and "Exhibit Hull Manuscript," appear to be on paper of the same quality, thickness, and color; that the ruling lines of the two papers correspond; that the imprinted trade-marks or manufacturers' marks at the upper corners of the two sheets correspond; that the sheet "Exhibit Hull Manuscript" is about an inch and a quarter shorter than the other by reason of its having been torn off; that each sheet is apparently but half of the original sheet, from which it has been torn along its lateral edge, and that upon placing the torn edges of the two sheets in contact, with the top of one coming exactly to a line with the top of the other, the torn edges appear to fit together, there being two slight projections at the edge of one sheet which fit into corresponding recesses at the edge of the other when the sheets are placed together, as above stated.]

Complainants' counsel objects to the examiner doing anything of the kind, and objects to the preceding statement of defendents' counsel, so far as relates to any alleged resemblance of the torn edges, because it is obvious that there are no resemblances there, except such as would naturally occur in case of sheets torn from the same quire, and because the examiner is not an expert nor a witness, nor appointed for the purpose of deciding such a question. He has no objection to the examiner certifying according to the first part of the request, if he sees fit, merely as a matter of convenience.

(Respondents' counsel states that there is no question to be decided, only a matter of fact now here appearing which ought to be stated on the record as a matter of protection to the defendants, since the paper is now going out of their possession and it will probably be a long time before the complainants close their rebutting testimony and give defendants the opportunity of examining witnesses concerning the paper, during which intervening time, these two exhibits being of writing paper and easily torn, might be accidentally, or designedly, altered, so that their edges would no longer correspond. And in making this last remark defendants' counsel disclaims any reflection upon complainants' counsel, or the examiner.)

Complainants' counsel objects to this persistent attempt to force upon the record the statements of the respondents' counsel, as if they were evidence; objects that it still more plainly appears from the second request, that it is an endeavor to have the examiner, who was appointed to take testimony, decide a disputed question of fact, and that it does not appear how long the defendants have had the paper in their possession, nor why they didn't produce it before.

(The examiner certifies that the statements of respondents' counsel are correct as to description of the two papers marked respectively "Exhibit Hull and Nesbit Manuscript" and "Exhibit Hull Manuscript," from the beginning as far as the words "torn along its lateral edge" and including said words, but that he declines to certify that the torn edges of the two half pages appear to fit together; that fact being disputed by complainants' counsel raising a question of fact, which the examiner does not believe that he has jurisdiction to decide.

(Respondents' counsel calls upon the complainants' counsel to produce, either now or at some time before the close of complainants' rebutting evidence, the full history of Cumberland county, containing the biographies referred to by Mr. Nesbit, in order that any biographical sketch of Mr. Drawbaugh that may appear therein may be put in evidence, to the end that the Court may have information of all that the book states about Daniel Drawbaugh.

The "Exhibit Hull Manuscript," is as follows:

"Daniel Drawbaugh

One of the greates inventive geniouses of *this* [the] age (so prolific of great men) is the subject of this sketch, Danl Drawbaugh, who was born in the year —— in the quiet secluded village of Milltown three miles S. W. of Harrisburg where he has spent the greater portion of an active life conceiving & producing as a result of the conceptions of an unusually fertile brain, a score of useful, ingenious machines & devices. It appears [that the] *by an* [in] examin*ation* [ing] the list of his inventions that the leading manufacturing intrests of the place (*Milltown*) in [his youthful] *his* boyhood days, gave direction to his thought & incentive to action. We propose to give herewith a sketch of his inventions but are sorry that we cannot accompany it with [a] *such* discription of each as their importance merits His first invention was an automatic sawing machine then a No. of machines used in wagon making next a machine for boring spoke tenets then a machine for sawing tenets a barrel-stave jointing machine patented 1851 this machine was pretty generally introduced & its merits apreciated, an automatic grinding machine was next invented to meet a demand created by the introduction of the jointer, then followed several machines for making staves heading & shingles all of which were patented 1855 after which machine for rounding heading crozing dressing & finishing outside of barrel were [next] invented these were again followed by a device for running mill stones one for dressing mill stones & a device for elevating [mill stones] *grain* in mills. He then invented & had patented 4 improvements in nail-plate feeding next a tack machine & a new design in tacks Photography next engaged his attention, he fitted himself for action in this field, by manufacturing his own camera ground & fitted acramatic lenses for camera prepared the necesorry chemicals & improved *the* process for enlarging pictures. Next electricity & and electric machinery attracted his attention and an electric machine was produced throwing out of consideration the galvanic Battery & [voltaic] *electric* pile, then a machine for alphebetical telegraphing then the justly celebrated electric clock & the machinery necessary for its construction & several kinds of telephones one of which [was] is opperated by Batery & another by induction It will be seen from the foregoing that Mr. Drawbaugh has has penetrated vast fields in search of information & with what success we leave to the reader to determine. We are proud to own Mr. D. as a citizen of our Township & deem him worthy of a position [of] at the head of the list of our prominent men & are hapy to accord him that position."

The examiner has indicated the erasures in both documents by *square* brackets, for the reason that round brackets occur in the papers themselves.

Re-direct by Mr. Storrow.

Q. Q. 140. I understand you to say after you saw me at the Bolton House last summer you searched with Mrs. Hull at her house at my request, to find if you could any materials or manuscript left by Mr. Hull relating to Milltown or to Mr. Drawbaugh; is that the fact?

Ans. It is.

Q. Q. 141. When and where was it that you found the biographical materials for Mr. Gorgas' biography, as stated in your 129th interrogatory?

Ans. It appears to me that I saw that among the papers at the Bolton House.

Q. Q. 142. Did you and Mrs. Hull search pretty thoroughly upon the occasion when you went to search at my request.

Ans. We did.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 29th day of November, 1882.

FRED. M. OTT,
Examiner.

J. C. NESBIT.

Adjourned until Monday, December 4, 1882, at 10, A. M., at the same place.

DECEMBER 4, 1882.

Examination resumed pursuant to adjournment.

Present, Mr. Storrow, for complainants, and Mr. Hill, for respondents.

Mrs. EMMA M. McDOWELL, *being produced, affirmed, and examined, saith:*

Examined by Mr. Storrow:

My residence is Cincinnati, Ohio; my husband's occupation is law-reporter, his name is George S. McDowell.

Q. 1. Please look at the history of Cumberland county, which I now show you, the title and imprint of which is as follows: "1731. History of Cumberland County, Pennsylvania, with illustrations. By Rev. Conway P. Wing, DD., and others. Philadelphia, James D. Scott, 439 Chestnut street, 1879," and containing on the back of the title page the following:

"Entered according to an act of Congress in the year 1879, by James D. Scott, in the office of the Librarian of Congress, at Washington, D. C. Herald Printing Company, Carlisle, Pa.," and tell me what relation you are to Mr. James D. Scott, the publisher?

Ans. A daughter.

Q. 2. Were you living at home and did you assist your father in the preparation of it in 1878?

Ans. Yes.

Q. 3. Please look at the biographies in the second column of the third page of biographical sketches at the end of that book, and tell me whether you wrote any of them yourself, and if so, which ones?

Ans. Yes; Daniel Drawbaugh's and William R. Gorgas'.

Mr. Storrow puts in evidence the biography of Daniel Drawbaugh as there printed, which is as follows:

"Daniel Drawbaugh:

An inventive genius of whom our country may feel justly proud, resides at his birth place, Milltown, three miles south-west of Harrisburg. His attention has, as a general thing, been devoted to the improvement of manufactures. His first invention was an automatic sewing machine, followed by various others, including a barrel stave pointer, which was patented in 1857 and pretty generally introduced. Several patents were also taken out in 1855. Many of his inventions, up to this time, had been devoted to the improvement of barrel-making. Mr. Drawbaugh understands photography thoroughly, preparing his own instruments and chemicals, and improving the process. Telegraphy and electric machines followed. He is the inventor of the justly celebrated 'Electric Clock,' and of several kinds of Telephones, one of which is operated by a battery and the other by induction. It will thus be seen that Mr. Drawbaugh has penetrated large fields in search of information, and with very remarkable success."

Q. 4. Did you write that biography of Daniel Drawbaugh from information originally collected by yourself, or from a manuscript which was furnished you to revise and shorten for publication?

Ans. From a manuscript furnished for revision.

Q. 5. Who handed you that manuscript?

Ans. My father.

Q. 6. Did he tell you from whom he had received it; and if so, from whom?

[*Objected to by Mr. Hill as hearsay.*]

Ans. From Daniel Drawbaugh.

Q. 7. Was it written in pencil or in ink?

Ans. In ink.

Q. 8. Have you made careful search for that manuscript at your father's house and have you been able to find it?

Ans. I have, but have not found it.

Q. 9. How carefully have you searched?

Ans. I have taken the files of papers from the place where they were put and looked at each one.

Q. 10. In that search did you find any of the manuscript belonging to the Cumberland county history?

Ans. No.

Q. 11. Have you any recollection what became of the manuscripts belonging to this history?

Ans. They were placed in a bag and taken to an outbuilding, where they were used for kindling.

Q. 12. How long ago was that?

Ans. In 1880.

Q. 13. On Wednesday last, November 29, 1882, Mr. Ott, the examiner, showed you, at my request, a manuscript in pencil, marked "Exhibit Hull Manuscript;" was that, or was it not, the manuscript which your father gave you to write this biography of Daniel Drawbaugh from?

Ans. It was not.

(Examiner notes that he did so show said exhibit to the witness immediately after adjournment on Wednesday.)

Q. 14. Please to look at the exhibits already in this case entitled "Drawbaugh's Bills for Repairs done for Eberly and Lee, John F. Lee, and Lee & Bayler, Jan. 27, 1882." (See respondents' printed record, page 1020) and state whether this exhibit does or does not appear to you to be in the same handwriting as the manuscript which your father handed you to write the biography of Daniel Drawbaugh from as you have stated?

[*Objected to by Mr. Hill, as leading, immaterial, irrelevant, and incompetent to a degree amounting to an utter burlesque upon evidence, there being no foundation whatever laid for asking any opinion of this witnees on the subject.*

Complainants' counsel objects to this attempt to put the remarks of counsel upon the record as if they were evidence or as if this were the proper place for argument.

Respondents' counsel adds that he further objects to this whole line of examination, as being an evident attempt of the complainants to rebut the testimony of their own witness, Nesbit, who was examined last week to prove that the work of collecting, revising, and forwarding to the publishers the materials for the history of Milltown or Eberly's Mills, and its inhabitants, as contained in said history of Cumberland county, was in the charge of Mr. Nesbit and Mr. Hull, as agents or employés of the publishers or proprietors of the history.

Complainants' counsel renews his objection, and requests the examiner to confine himself to his only function, which is to take and report the evidence.]

Ans. It appears to be in the same handwriting.

(The "Exhibit Drawbaugh's Bill for Repairs done for Eberly & Lee," &c., is now delivered into the custody of the examiner.)

Q. 15. State whether you have, or have not, been in the habit of examining handwriting, and noticing the differences between the different styles and the writing of different persons?

[*Same objection.*]

Ans. I have.

Q. 16. Please to read the "Exhibit Hull Manuscript," as copied on the record at the close of Mr. Nesbit's deposition, and tell me how its contents compare with the manuscript from which you prepared the Drawbaugh biography?

[*Same objection.*]

Ans. It resembles it.

Q. 17. Please state more particularly whether the manuscript from which you prepared the biography contained substantially all that is in this "Exhibit Hull Manuscript," and whether it contained anything which is not in this Hull manuscript?

[*Same objection.*]

Ans. It contained substantially all that is in this. It contained some additional matter in regard to one of the inventions.

Q. 18. What invention; and what was the nature of that additional matter?

[*Same objections.*]

Ans. The electric clock; the dimensions of the clock were described.

Q. 19. In this "Hull Manuscript" I find that the only reference to telephones is a statement that among Mr. Drawbaugh's productions were "the justly celebrated electric clock and the machinery necessary for its construction and several kinds of telephones one of which is operated by a battery and another by induction." I find in the biography as printed the following sentence: "He is the inventor of the justly celebrated electric clock and of several kinds of telephones, one of which is operated by a battery and the other by induction;" is it or is it not your recollection that the manuscript furnished you contained substantially that phraseology?

[*Same objection.*]

Ans. It is my recollection that it did.

Q. 20. According to your recollection did or did not that manuscript furnished to you contain a statement that Mr. Drawbaugh was the first person in the world who had ever invented or made an electric speaking telephone?

[*Same objections.*]

Ans. I do not recollect that statement.

Q. 21. If there had been such a statement in it, would it or would it not have attracted your attention, and would you or would you not have retained it and had it printed in the biography?

(Same objections, and further objected to as hypothetical, and calling for mere opinion.)

Ans. It would have attracted my attention and I think I should have had it printed.

(Without waiving the objections above stated, respondents' counsel cross-examines de bene esse.)

Cross-Q. 22. When did you last see that alleged manuscript, from which you gathered the materials for that biographical sketch of Daniel Drawbaugh?

Ans. In the year 1880.

Cross-Q. 23. What part of the year 1880?

Ans. I cannot tell, but it was between the months of September and June.

Cross-Q. 24. Do you mean between September, 1879, and June, 1880?

Ans. No; between September, 1880, and June, 1881.

Cross-Q. 25. How came you to see it then?

Ans. I came across it when I was arranging some scattered papers in the outhouse where those papers had been placed

Cross-Q. 26. Did you read it at that time?

Ans. I picked it up and read it over.

Cross Q. 27. How long did you have it in your hands at that time?

Ans. Probably two or three minutes.

Cross-Q. 28. When had you last seen it before that?

Ans. While preparing the history.

Cross-Q. 29. State just at what time you prepared that biographical sketch of Mr. Drawbaugh's?

Ans. I don't remember the exact time.

Cross-Q. 30. Was it in the summer of 1878?

Ans. I think it was.

Cross Q. 31. How long did it take you to prepare the biographical sketch of Mr. Drawbaugh?

Ans. About an hour.

Cross-Q. 32. That was, then, about all the time you had to spend with the manuscript, was it not?

Ans. It was.

Cross-Q. 33. When did you for the first time see those Lee & Eberly accounts referred to in your 14th question?

Ans. On last Wednesday.

Cross-Q. 34. How many other biographical sketches contained in this history of Cumberland county did you prepare?

Ans. I only recall those of Daniel Drawbaugh and William R. Gorgas; I know that I did more, but don't remember which ones.

Cross-Q. 35. How many more did you write do you think?

Ans. Probably five or six.

Cross-Q. 36. Do you remember any statements contained in the biography of any one of the parties whose biographies you wrote for that history, excepting that of Mr. Daniel Drawbaugh?

Ans. I remember some of the statements in the Gorgas biography.

Cross-Q. 37. You have read over the Gorgas biography within the last week, have you not?

Ans. I have.

Cross-Q. 38. You have also, of course, read over the biography of Daniel Drawbaugh within the last week?

Ans. Yes.

Cross-Q. 39. Then I understand you that you cannot remember any statements contained in any of the biographies except those of Daniel Drawbaugh and William R. Gorgas; am I correct?

Ans. I cannot at present recollect.

Cross-Q. 40. As you have read over the biography of William R. Gorgas within the last week, and as it comprises only thirteen lines in the printed history, I wish you as an illustration of the strength of your memory for a period of one week or less, to state to me all that you can remember of the contents of the said biography of Mr. Gorgas, I holding the history in my hand while you do so.

Ans. The biography states that the ancestors of Mr. Gorgas emigrated from Holland and settled near Germantown, Penna., and then there are some matters which I don't remember, and the sketch closes with a list of Mr. Gorgas' children with their names in full.

Cross-Q. 41. Is that all that you can remember of the biography of Mr. Gorgas, as printed in the history?

Ans. That is all.

(Respondents' counsel here puts in evidence a copy of said biographical sketch of Mr. Gorgas in the exact words of the history, as follows:

"William R. Gorgas

Is the descendant of an emigrant from Holland, John Gorgas, who settled in Germantown, near Philadelphia, prior to the year 1700. His grandson, the father of Mr. William Gorgas, bought a tract of land in Lower Allen Township in 1803. The property originally belonged to the Penns. It contained a log house and barn, which have been enlarged and improved from time to time, and the barn entirely rebuilt, with various outbuildings. Wm. Gorgas was born in 1806, May 8th, and married in 1840 to Elizabeth Hummel. Five of his children are living. He has settled various estates, and acted as guardian for a number of children. Served in the Legislature 3 years, and 3 years in the State Senate. He has resided in Harrisburg since November, 1877. A considerable quantity of iron ore has been found upon his farm, but it has not been worked for some years."

Cross-Q. 42. On what day did you last read the biographical notice of Mr. Gorgas?

Ans. On last Wednesday, November 29th, 1882.

Cross-Q. 43. Please look again at the history, and count the biographical sketches, and tell me how many there are?

Ans. Twenty, besides one about Henry S. Rupp's nurseries, one about Schroeder & Sons' carriage-works, and one about the White Hall soldiers' orphan school.

Cross-Q. 44. How happened you to be reading in that history on last Wednesday, November 29th?

Ans. We were discussing the matter of Mr. Drawbaugh, and looking at this paper—the handwriting, [indicating the Lee & Eberly accounts above referred to,] and as the history was open, my eye fell on Mr. Gorgas' sketch, and I looked it over.

Cross-Q. 45. Who was discussing the matter of Mr. Drawbaugh at that time, and where was it that the discussion took place?

Ans. Mr. Storrow and myself, in Mr. Storrow's room.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 4th day of December, 1882.

FRED. M. OTT,
Examiner.

EMMA M. MCDOWELL.

Recess for lunch until 2.30, P. M.

December 4, 1882, 2.30, p. m.

Examination resumed pursuant to adjournment.

Present, Mr. Storrow for complainants and Mr. Hill and Mr. Jacobs for respondents:

James D. Scott, *being produced, sworn and examined, saith:*

Examined by Mr. Storrow.

Q. 1. State your age, residence and ocupation?

Ans. Age, fifty-four; residence, New Britain, Pennsylvania: my occupation is local atlas and map publishing; I have also published some local histories.

Q. 2. Are you the James D. Scott who published the history of Cumberland county now shown you and which has been referred to in the depositions of the two preceding witnesses?

Ans. Yes, sir.

Q. 3. This purports to be printed by the Herald Printing Company of Carlisle, Pennsylvania; did you make a contract with them for printing it; and if so when was it?

Ans. I did, and it was some time early in 1878 that I made the arrangement: the contract was finally signed in June.

Q. 4. It appears from the title page to have been edited by Rev. Dr. Wing. Did you arrange with him to edit it: and if so, when?

Ans. I did and it was in 1877 about the middle of the year some time: I can't tell exactly the time now.

Q. 5. The first part of it, through page 199, appears to be a general history and description of the county; on page 200 begins what is called in the book "History of the townships and boroughs of Cumberland county" and the first article under that heading is entitled "Lower Allen Township, by J. C. Nesbit, Esq.": did you personally arrange with Mr. Nesbit to write the history of Lower Allen township?

Ans. Yes, sir.

Q. 6. Please state generally how you came to make the arrangement with him, and what the nature of it was.

Ans. I was looking around for a local historian in connection with my canvassing, and I was referred to several parties who would probably be able to gather together, and write the local history, amongst others, Mr. Nesbit, to whom I went, and made an arrangement to write the local history. In connection, I associated with him a Mr. Hull of the same village.

Q. 7. Did Mr. Nesbit subscribe for a copy of the book?

Ans. Yes, sir.

Q. 8. Was his subscription made on the same day when you arranged with him for the preparation of the history of Lower Allen, or on a different day?

Ans. It was on the same day.

Q. 9. Please to look at your subscription-book, and turn to his subscription, and read the date under which it is entered; I refer to the book which I here produce.

Ans. His subscription is under date of July 7th, 1878.

Q. 10. Did Mr. Daniel Drawbaugh subscribe for this history; and, if so, will you point out his subscription, in order that the examiner may copy it into the record?

Ans. He did subscribe.

(Witness points out the subscription in the subscription-book; which is as follows: The pages are headed with the following printed matter:

"We, the undersigned, have purchased, and do hereby agree to take of JAS. D. SCOTT, one copy of his Illustrated History of Cumberland County, Penn'a, for which we each do separately agree to pay to him, or his order, the sum of ten dollars ($10) upon delivery of said work at our residence or place of business. Said history to be in size twelve (12) by nine (9) inches, and similar in detail and general character to sample exhibited by solicitor. And we subscribe, subject to the following conditions:—That our subscription is for the book alone; personal matter, such as views, portraits, and biographies, costing extra, and to be paid for by those having them inserted. The work to be delivered as soon as it can be completed, which shall not exceed one year from date of canvass. That no promise made by an agent which interferes with the intent of this contract is valid.")

☞ NOTICE. ☜

Read contract on opposite page.

AN AGENT IS NOT PERMITTED TO TAKE NAMES FOR INFLUENCE.

Post Office Address.

Low All *Names.* continued	Copies	Date of order	
Henry S. Rupp	1 Paid	— 16	Shiremanstown Pa
B. F. Miller	1	Aug 20	Lisburn, Cumb. Co. Pa
H. M. Bitner	1 Paid	" 20	Shiremanstown
A. L. Rupp	1	" 21	Shiremanstown
Danl. Drawbaugh	1	Note " 21	Eberlys Mills
Wm S. Dellinger	1	Note " 21	Eberlys Mills
Fredk. K. Sheeley	1	Paid " 21	" "
Reuben S. Roth	1	" 23	Shiremanstown
S. L. Goodyear	1	" 23	Lisburn"

(The words "Low All continued" interlined in pencil.)

Q. 11. I do not see the year written on that page. Will you turn back in the book and read the entry nearest to Mr. Drawbaugh's subscription which has the year?

Ans. The first date on the next preceding page but one is July 23rd, 1878.

Q. 12. Then I understand the statement in the book to be that Mr. Drawbaugh subscribed August 21st, 1878; is that the fact?

Ans. Yes, sir.

Q. 13. Did you take that subscription; and did you see him write his name in the book, where you have just shown it?

Ans. Yes, sir; I saw him write his name in the book.

Q. 14. Where was it that you obtained his subscription, and that he so wrote his name?

Ans. It was at his mill or factory, in Lower Allen township.

Q. 15. Did you make any agreement or arrangement with him about publishing his biography in your proposed book; and if so, state generally the nature of that arrangement and what was done on that occasion about preparing his biography?

Ans. Yes, sir; I agreed to publish a short biography of subscribers at that time and in order to obtain this biography I had printed slips with questions to be answered; I commenced asking him the questions to fill up the slip and had it partly filled up when I found that I couldn't get in all he wanted on my slip; and I told him he had better write out a little sketch of what he wanted for himself; and he thought so too; and we agreed to leave it that way—for him to write out a short sketch of his history and mail it to me.

Q. 16. Did you afterwards receive that sketch by mail?

[*Counsel for respondents says: Inasmuch as a biographical* *sketch of Daniel Drawbaugh was found in the handwriting of Mr. Hull, one of the agents for the publication of that book, which bears a striking resemblance to the sketch in the book, he objects to the question, as indefinite and misleading unless the complainants shall afterwards show from what person the sketch referred to in a question, was received.*

And he further objects to the whole matter of this deposition up to this point, as irrelevant and immaterial and not in rebuttal.]

Ans. Yes, sir.

Q. 17. Was or was not Mr. Hull employed by you to prepare a biographical sketch of Mr. Drawbaugh for publication in this book?

Ans. He was not employed to write biographical sketches.

Q. 18. Did you ever ask Mr. Hull to write a biographical sketch of Daniel Drawbaugh?

Ans. No, sir.

Q. 19. Did you or did you not ever have any conversation with Mr. Hull with reference to writing a biographical sketch of Mr. Drawbaugh for this book?

[*This and the last two preceding questions and answers objected to by respondents' counsel as immaterial and irrelevant and incompetent, it already having appeared from the testimony of complainants' witness Nesbit that Mr. Hull, at the time when the history was preparing, understood himself to be employed to prepare biographical sketches. And further, that as he is now dead, the respondents are deprived of his testimony on the subject. The testimony of this witness as to matters that passed between him and the deceased Hull will be but one sided and hearsay, besides being utterly irrelevant to the issues in this case.*

Complainants' counsel objects to the statements in the preceding remarks as unfounded, and further, because it is obvious that the complainants are the losers by the death of Mr. Hull, so far as his deposition would be of value.

Respondents' counsel objects to this last statement as an utterly unfounded assumption, the exact contrary of which respondents' counsel believes to be true.]

Ans. I never did; I don't think.

Q. 20. Did you or did you not ever ask anyone to prepare for you a sketch or the materials for it, except in the suggestion made to or by Mr. Drawbaugh on the occasion when you took his subscription?

[*Objected to by Mr. Hill, as immaterial and irrelevant, and only in rebuttal of complainants' own evidence.*]

Ans. I think not; I don't recollect that I did.

Q. 21. Was the biographical sketch of Mr. Drawbaugh which you received as you have stated written in pencil or in ink?

[*Same objection.*]

Ans. It was written in ink, I think; I am sure it was.

Q. 22. Whom did you hand it to to prepare the biography for publication as it was published in that part of the book which I now show you?

[*Same objection.*]

Ans. I handed that, with others, to my daughter to prepare, revise, or review I might say.

Q. 23. Did you read it before you handed it to her?

[*Same objection.*]

Ans. Yes, sir.

Q. 24. Please to read the "Exhibit Hull Manuscript," as entered on the record at the close of Mr. Nesbit's deposition, and state whether, according to your recollection, the manuscript of Daniel Drawbaugh's biography which you so handed to your daughter, did, or did not, contain substantially what is found in that exhibit; and whether it did or did not contain anything in addition to what is contained in that exhibit?

[*Same objection.*]

Ans. I think that this is very similar, but it seems to be in some places fuller and in others not so full as that biography. That is to say, I don't remember some of the mechanical matter. He went into some things more fully, for instance about the clock; otherwise I should say it is very similar.

Q. 25. At the time when you were at his shop and got his subscription and talked to him about his biography, did he or did he not tell you that he was or claimed to be the first man in the world who had ever invented or made an electric speaking telephone?

[*Same objection.*]

Ans. No, sir; he didn't tell me anything of that kind.

Q. 26. Is or is not a statement of that kind, if it had been made to you, one that would have impressed itself upon your recollection, and have been put into your book?

[*Same objection, and further objected to as hypothetical argu-*

mentative, calling for mere opinion, substantially leading, and otherwise incompetent.]

Ans. It certainly would have impressed itself on my mind, but I don't know whether it would have been put into the book unless it was in the written biography.

Q. 27. Referring now to the manuscript biographical sketch of Daniel Drawbaugh which you say you received, do you know where it is now or whether or not it exists?

Ans. That, with several other manuscripts, was received back from the printing office, kept for a time, and I suppose it was destroyed with others.

Q. 28. My question did not relate to your daughter's manuscript, from which that article was printed, but to the manuscript sketch which you say you received and handed to your daughter; have you got that or do you know where it is?

[*Objected to as almost directly instructing the witness to change the testimony just given in his last answer.*]

Ans. I think they were all destroyed together; we haven't got it—can't find it—all destroyed together, I think.

Q. 29. State whether or not you have made careful search for the manuscripts and papers connected with this history of Cumberland county.

Ans. Yes, sir.

Q. 30. I observe that the word "note" is written in ink opposite the pencil subscription of Mr. Drawbaugh in the subscription book; in whose handwriting is that word, and what does it signify?

Ans. It is my own handwriting, and it signifies a note taken in payment of a copy of the history delivered to him.

Q. 31. Please produce the note which was taken from Mr. Drawbaugh in payment for that history and read it as part of your answer.

[*Objected to by Mr. Hill as utterly immaterial and irrelevant.*]

Ans. Here it is. (Witness reads.)

"*1046*

$\$10\frac{00}{100}$ *Eberly's Mills, Feb. 27th*, 1879.

Forty days after date *I* promise to pay to the order of *James D. Scott* at the First National Bank of *Harrisburg ten* $\frac{00}{100}$ dollars without defalcation for value received.

Dan'l Drawbaugh.

Credit the drawer.

Apr. 11th."

(The italics represent words written in ink and the balance of the face of the note is printed, as is also the word "Newville" which has been erased and the words "Eberly's Mills" substituted for it the first time, and Harrisburg the second time, indicating the place where the note was made and the place of payment respectively. The face of the note also has in pencil the words "Not paid" written across it; the endorsements are as folllows:

"1046 D. Drawbaugh 10 Apr. 11th" (in red ink). "James D. Scott" (in ink across the middle). "Pay F. C. First, Esq., Cashier or order for Collection & Credit; for account of Carlisle Deposit Bank.

S. Keller, Cas."

all stamped in red ink except the proper names which are written in black ink, and the whole erased in pencil. "Not good" written in pencil before the foregoing.)

Q. 32. It is made to the order of James D. Scott and bears across the back the name "James D. Scott"; in whose hand-writing is that name across the back?

[*Same objection.*]

Ans. My own.

Q. 33. Abraham B. Shank, a witness called for the respondents, testified and produced on page 33 of respondents' printed record an execution against Daniel Drawbaugh in favor of James D. Scott, for the total sum of seventeen dollars and fifty-four cents, including costs; did you or did you not put that note in the hands of an attorney for collection and suit?

[*Same objection.*]

Ans. I did, after it had become due and was unpaid.

(Without waiving any of the above objections respondents' counsel cross-examines *de bene esse.*)

Cross-Q. 34. The note which you have produced is in the form of an accommodation note; was it so intended and used at the time?

Ans. No, sir; it was received as payment for the subscription and used as such.

Cross-Q. 35. Was this history of Cumberland county the first local history that you were ever connected with?

Ans. Yes, sir; I believe it was the first history—not the first other publication.

Cross-Q. 36. What other subscription publication had you been connected with prior to that?

Ans. I had been publishing county maps previous to that: I had published perhaps fifty or sixty county maps and atlases; and I recall now a mistake in my previous answer; I had put a short sketch of history in one or two of my atlases previous to this.

Cross-Q. 37. Were those county maps published on subscription?

Ans. Yes, sir; we always publish county maps by subscription.

Cross-Q. 38. Did you personally canvass or direct the canvassing for subscriptions for those maps?

Ans. I did both; the larger part was done through canvassers under my direction.

Cross-Q. 39. Then, in the year 1878, you were already an old hand at the canvassing and subscription publication business, were you not?

Ans. Yes, sir; I suppose so, although not considered a very good hand by some of my best canvassers.

Cross-Q. 40. How many visits did you ever make to Daniel Drawbaugh's shop at Eberly's mills?

Ans. I don't recollect of ever being there but the once, which was at the time I took his subscription.

Cross-Q. 41. That was on the 21st day of August, 1878, was it not?

Ans. Yes, sir.

Cross-Q. 42. How long did you stay there at his shop on that visit?

Ans. I can't tell exactly how long; some little while; some time, talking; I was there may be half an hour; may be an hour.

Cross-Q. 43. What time of day was it?

Ans. I can't recollect.

Cross-Q. 44. Did you see any telephones there at his shop on that visit?

Ans. No, sir; I don't think I did; I saw some other machinery and some other inventions; I saw an electric clock.

Cross-Q. 45. Are you sure that you never saw an electric speaking telephone at Mr. Drawbaugh's shop?

Ans. I am sure I never did; I don't think anything was said about it.

Cross-Q. 46. Are you sure about that last part of the statement, that nothing was said about telephones at his shop?

Ans. Yes; I am sure that if I had heard about that, it would have impressed my memory. I was interested in hearing about the telephone at that time; some of my friends were talking about it and I would have remembered it.

Cross-Q. 47. Did you have any talk with Mr. Drawbaugh during that visit about his making any drawings for you, to be used by you in connection with the proposed history?

Ans. O, yes; I remember that; he told me he was an artist also, and could make sketches for me if I wanted any made; I told him I might have some for him to do.

Cross-Q. 48. Did he show you any specimens of his skill in sketching?

Ans. Yes, sir.

Cross-Q. 49. Now don't you remember that you held out the inducement to him that if he would subscribe for that history you would furnish him with work in making sketches or drawings to be published in it, and would pay him for such work?

Ans. No, sir; for he subscribed before anything was said about the pictures; I remember that well.

Cross-Q. 50. Did you mention to him any particular sketches that you were thinking of having made for the history?

Ans. I don't recollect; I may have mentioned some views that we had engaged by that time, that would have to be sketched by some one; I think likely I did.

Adjourned until Dec. 5, 1882, at 10, A. M.

DEC. 5, 1882, 10, A. M.

Examination resumed pursuant to adjournment; present, same counsel.

Cross-examination of James D. Scott, by Mr. Hill, continued.

Cross-Q. 51. Do you remember talking with him about making a sketch of Boiling Springs for the history?

Ans. Yes, sir; I think I mentioned Boiling Springs as one that I would have to have sketched.

Cross-Q. 52. Do you remember talking with him about making any sketches of Milltown or of anything there or in that neighborhood?

Ans. I do not recollect any special views that I mentioned, in that neighborhood; I do recollect that I mentioned that I had engaged views at Boiling Springs and Mount Holly Springs, but I don't think that I had those engaged in that neighborhood by that time.

Cross-Q. 53. Do you remember telling him that you had thought of employing some Philadelphia artist to make your sketches, but that as he, Drawbaugh, was on the ground, it would be more convenient for you to employ him?

Ans. I didn't use that language—that I had thought of employing a Philadelphia artist, for I had a number of sketches in the western part of the county already done by a Philadelphia artist at that time. And yet I may have told him that it would be more convenient, if he could do it, for me to employ an artist there; not making it specific but indefinite.

Cross-Q. 54. A judgment against Daniel Drawbaugh in your favor for $17.54 has been referred to, and you have stated substantially that that judgment was on the ten dollar note which Drawbaugh gave you; how came you to have the note here in your possession, if it had been put in suit and judgment obtained upon it?

Ans. The note was deposited in the Carlisle Deposit Bank or in one of the Carlisle banks for collection among others; and at maturity, not being paid, I received it back from the bank and placed it with my attorney, Mr. Leidich, of Carlisle, for collection with request to write to him, Drawbaugh, before suit was brought, and it not being paid for some time Mr. Leidich was instructed to bring suit; on which he informed me judgment was obtained and execution issued, I believe; I don't know whether it was paid before actual levy or not. At any rate it was paid, debt and interest and costs, and Mr. Leidich remitted me the amount of my note. I gave no further thought, but supposed that the note was given up at the time of the execution and payment, and had no other knowledge of it until it was shown me by Mr. Comfort, I believe, sometime during the present summer or during the present year, when he informed me that he had received it from Mr. Leidich on an order that I had given him for any papers relating to Mr. Drawbaugh; I have not had it in possession myself.

Cross-Q. 55. Do you mean Mr. John C. Comfort, of Cumberland county?

Ans. Yes, sir.

Cross-Q. 56. How came the judgment to be for $17 54 when the note was only for ten dollars; what did the $7 54 represent?

[*Question objected to by Mr. Storrow, because the proper answer is to be found in the records of the suit and in the execution in the hands of respondents' witness Shank.*]

Ans. I believe it represents the interest and costs of the suit.

Cross-Q. 57. Did you have any account against Mr. Drawbaugh besides the note?

Ans. I had a memorandum of the subscriptions not paid; that might be called an account, but not in a very regular way.

Cross-Q. 58. You mean a memorandum of the ten-dollar subscription, which was covered by the note, do you?

Ans. Yes, sir.

Cross-Q. 59. That is all the account you had against him, is it?

Ans. Yes, sir; I believe so.

Cross-Q. 60. Had Drawbaugh ever paid you any money, up to the time when that note was put in suit?

Ans. No, sir; he had not.

Cross-Q. 61. Did he pay you anything at the time he subscribed for the book?

Ans. No, sir.

Cross-Q. 62. Did you have to bring any suits against other parties to collect subscriptions for the book?

Ans. I did; some others.

Cross-Q. 63. What was the regular subscription price of the book?

Ans. Ten dollars.

Cross-Q. 64. Do you mean ten dollars for the book, without any biographical sketch?

Ans. Yes, sir; that was the subscription price of the book, without anything else.

Cross-Q. 65. How came you to publish some of the books with biographical sketches, and some without?

Ans. It was because Doctor Wing, who had the editorial charge of the work, objected to publishing these small biographies; and, as we did not enter into the plan of publishing biographical sketches for subscribers until near the close of the subscription, I only had them bound in that part that we distributed in the eastern part of the country.

Cross-Q. 66. How many of the books did you have bound up with biographical sketches, and distributed to subscribers?

Ans. I do not recollect now; I think nearly half of the edition of four hundred.

(*Examination of this witness was suspended to take depositions of Levi Maish and George C. Maynard and resumed after said depositions were completed.*)

Adjourned until Dec. 6, 1882, at ten, A. M.

DECEMBER 6, 1882, 10, A. M.

Examination resumed, pursuant to adjournment.

Present, Mr. Storrow and Mr. Smith for complainants, and Mr. Hill and Mr. Jacobs for respondents.

Cross-examination of James D. Scott, by Mr. Hill, continued.

Cross-Q. 67. How many biographical sketches were published in the book?

Ans. I did not count them, but I think there were about twenty of these at the end and then there were some more scattered through the work, some of which were in connection with the medical profession.

Cross-Q. 68. Can you name any subscriber of whom no biographical notice was contained in the book, but to whom one of the books containing biographical notices was delivered in performance of the subscription contract on your part?

Ans. I can't remember any particular subscriber, but I think they were generally delivered in the eastern part of the county with biographical sketches.

Cross-Q. 69. What charge did you make for inserting a biographical sketch without any illustration?

Ans. When the contracts were first printed we intended to charge from ten to twenty dollars, but the agents said they could get subscribers best without biographical sketches; and near the close of the subscription I made it gratuitous in soliciting their subscriptions.

Cross-Q. 70. Was Mr. Gorgas' biographical notice a gratuitous one?

Ans. Yes, sir; I think it was; Mr. Gorgas paid for a sketch or view extra.

Cross-Q. 71. Was Mr. Daniel Drawbaugh's biographical sketch gratuitous?

Ans. It was.

Cross-Q. 72. Was there a sketch or picture published of Mr. Gorgas' place of business or residence?

Ans. There was of his residence, or farm, rather. It is called the "Gorgas Homestead."

Cross-Q. 73. With reference to Mr. Gorgas' biographical notice and the picture of his homestead, who transacted the business with him on your part?

Ans. I don't remember who took the order. I think Mr. Swartz. I am not certain.

Cross-Q. 74. Please give a list of the twenty biographical sketches contained in the last part of this book.

Ans. John Eberly, Sr., Henry S. Rupp, nursery, H. M. Bitner, Shroeder & Sons, Julius B. Kaufman, Hon. George M. Mumper, William Brooks, George Walker, Daniel Drawbaugh, William R. Gorgas, George M. Rupp, Levi Hertzler, Major J. A. Moore, John G. Heck, J. T. Criswell, M. D., H. M. Rupley, Henry R. Mosser, George Messinger, H. K. Witmer, Samuel M. Hertzler, Matthias Bitner, James M. Ralston.

Cross-Q. 75. Did Mr. Coble do any work for you in getting up those biographical sketches, or any of them?

Ans. No, sir; I don't know him.

Cross-Q. 76. Did Mr. D. A. Hamacher do any work for you in getting up any of them?

Ans. I don't remember making any arrangement with him. I think one or two of the personal sketches came in with his name attached.

Cross-Q. 77. Did they come in direct, or through Mr. Hull's hands?

Ans. I think they were sent to the Carlisle *Herald* office. I don't know who sent them. I don't remember. Most of those sketches were sent to Carlisle to my name in care of the *Herald* office. Some were sent to Dr. Wing. I told them to send them either to me or to Dr. Wing, or *we* told them. I didn't always tell them myself. Sometimes the agents did.

Cross-Q. 78. What agents—those who were soliciting subscriptions, or those who were obtaining information to be put into the history?

Ans. Those who were obtaining subscriptions.

Cross-Q. 79. Did Mr. Hamacher obtain any subscriptions, or act as an agent for subscriptions?

Ans. No, sir; I think not. I don't remember, if he did.

Cross-Q. 80. Please look at the book, and see if Mr. Hamacher's name is not signed to one of the biographical sketches; and, if so, which one?

Ans. It is printed as having been signed to George M. Rupp's sketch.

Cross-Q. 81. Who employed Mr. Hamacher to get up that sketch of George M. Rupp's life?

Ans. I don't know. It may have been Mr. Rupp himself. The parties were sometimes left to write out their own lives, and he may have been employed by Mr. Rupp, as a neighbor, and the sketch received as authentic. I don't know anything about it.

[*The statement about what may have been, objected to by Mr. Hill, as irresponsive and mere guesswork.*]

Cross-Q. 82. Who furnished the materials for Mr. Gorgas' biographical sketch?

Ans. I don't recollect.

Cross-Q. 83. Who furnished the materials for Major Moore's biographical sketch?

Ans. I don't remember that either, now.

Cross-Q. 84. Who furnished the materials for Samuel M. Hertzler's biographical sketch?

Ans. I don't remember.

Cross-Q. 85. Who furnished the materials for John G. Heck's biographical sketch?

Ans. That was made out by one of the blanks being filled out by myself, asking him questions and receiving answers.

Cross-Q. 86. Who furnished the materials for Dr. Criswell's biographical sketch?

Ans. I don't recollect hardly any of these.

Cross-Q. 87. Do you recollect about H. M. Rupley's?

Ans. No, sir; I do not.

Cross-Q. 88. Or Mr. Walker's, or Mr. Eberly's, H. M. Bitner's, Matthias Bitner's, Mr. Witmer's, Mr. Messinger's, or Mr. Ralston's?

Ans. I don't remember any excepting Mr. Walker's and Matthias Bitner's. I know I made them out on blanks myself.

Cross-Q. 89. You state that you made Mr. Walker's, Mr. Heck's, and Matthias Bitner's, and made them on blanks which you had prepared for the purpose; and while answering the questions this morning you have had the history in your hand. Do you recognize in those three biographies so close a correspondence to the arrangement of the blanks that you are able so to testify, or would you have been able so to testify without looking at the book?

Ans. I would, for I remember distinctly of filling in those biographies.

Cross-Q. 90. When Daniel Drawbaugh's biographical sketch came to you by mail, where did it come, to Philadelphia or Carlisle?

Ans. I am not positive, but I think to my address at Carlisle.

Cross-Q. 91. Who opened the enclosure containing it?

Ans. I did.

Cross-Q. 92. Do you make that answer because you always opened any communications that were addressed to you at Carlisle, or because you distinctly remember opening that enclosure?

Ans. Yes; I answer because I always opened communications addressed to me at Carlisle, and most of those biographical sketches were addressed to me at Carlisle, and those addressed to either myself or Dr. Wing were handed directly to me without change, I suppose.

Cross-Q. 93. Do you remember whether this particular enclosure was addressed to you personally, or in the other way that you have mentioned—to you or Dr. Wing?

Ans. I don't remember distinctly about that. It came into my hands.

Cross-Q. 94. Was there anything else inclosed in the same enclosure with it? If so, what?

Ans. I don't remember that there was anything else, except the blank which I had partly filled, and left with him to finish. I think that was with it.

Cross-Q. 95. Do you swear positively that that was with it?

Ans. Not positively. I know it was with it when I put it into my daughter's hands.

Cross-Q. 96. When that biographical sketch of Drawbaugh came into your hands at Carlisle, did you put it immediately into your daughter's hands?

Ans. As soon as I could conveniently.

Cross-Q. 97. Did you first read it, or merely glance at it to see what it was?

Ans. I kept them in my room until I returned home, and during the interval I read over the papers or sketches, and I read this one—this sketch.

Cross-Q. 98. Have you any distinct recollection of reading this particular sketch at that time, or do you merely suppose that you read it with the rest?

Ans. I remember reading it.

Cross-Q. 99. Did you read it more than once?

Ans. I don't remember that I did. I looked it over with my daughter after I went home.

Cross-Q. 100. Was that for the purpose of comparing it with what your daughter had made out as a sketch to be published?

Ans. That; and also we looked it over, and made suggestions, before she had written.

Cross-Q. 101. Suggestions as to what changes should be made in it for publication?

Ans. Yes; sir; I made suggestions where it might be cut down without impairing the value of the biography.

Cross-Q. 102. Did you ever see it afterwards?

Ans. I don't remember positively; I think I did. I put it away with my other papers, and never looked at it much after that.

Cross-Q. 103 When manuscripts were addressed in the alternative to you or Dr. Wing, as you have stated, did Dr. Wing open such as came into his hands from the post-office?

Ans. I never saw him do so; I suppose he did open his letters.

Cross-Q. 104. State what that address was that you refer to as being to you or Dr. Wing. How would the address of a letter so directed read?

Ans. I don't remember anything excepting "Rev. C. P. Wing, Carlisle," his address.

Cross-Q. 105. Then you directed parties to address their communications either to you or to Dr. Wing as they might elect or prefer; is that the idea?

Ans. Yes, sir. the sketches, though, probably were requested to be directed especially to me, though to either would answer.

Cross-Q. 106. I observe that three of the biographical sketches in the history, to wit, that of John Eberly, Sr., that of Wiliam Brooks and that of George M. Rupp are signed; do you remember the manuscripts of those particular sketches or any of them?

Ans. I don't remember those distinctly.

(The three referred to are signed respectively "Samuel Eberly," "James Brooks," "D. A. Hamacher.")

Cross Q. 107. Do you remember any other manuscript biographical sketch that was signed, except those three?

Ans. I don't remember any other.

Cross-Q. 108. In the printed biographical sketch, I observe certain statements, such as the following: "Daniel Drawbaugh, an inventive genius of whom our country may feel justly proud." "It will thus be seen that Mr. Drawbaugh has penetrated large fields in search of information and with very remarkable success." Would you not consider those rather remarkable statements for a man to make about himself?

Ans. I wouldn't consider them very remarkable for a man who has a high opinion of himself.

Cross-Q. 109. I wish to point out to you some peculiar correspondences between the statements contained in "Exhibit Hull Manuscript" and the statements contained in the biographical sketch of Daniel Drawbaugh published in the history, as follows:

Extracts from Manuscript.	Extracts from Biography.
Daniel Drawbaugh, one of the greatest inventive geniuses of this age.	Daniel Drawbaugh, an inventive genius of whom any country may feel justly proud.
Milltown, three miles S. W. of Harrisburg.	Milltown, three miles south-west of Harrisburg.
His first invention was an automatic sawing machine.	His first invention was an automatic sewing machine.
Pretty generally introduced.	Pretty generally introduced.
All of which were patented 1855.	Several patents were also taken out in 1855.
Photography next engaged his attention; he fitted himself for action in this field by manufacturing his own camera, ground and fitted acramatic lenses for camera, prepared the necessary chemicals and improved process for enlarging pictures.	Mr. Drawbaugh understands photography thoroughly, preparing his own instruments and chemicals, and improving the process.
The justly celebrated electric clock.	The justly celebrated electric clock.
Several kinds of telephones, one of which is operated by a battery and another by induction.	Several kinds of telephones, one of which is operated by a battery and the other by induction.
It will be seen from the foregoing that Mr. Drawbaugh has penetrated vast fields in search of information, and with what success we leave to the reader to determine.	It will thus be seen that Mr. Drawbaugh has penetrated large fields in search of information and with very remarkable success.
We are proud to own Mr. D. as a citizen of our township.	Of whom our country may feel justly proud.

These expressions, follow in the same order in each, except in case of the last quoted, in which the statement of being proud of Mr. Drawbaugh is at the beginning in the history, and near the end of the manuscript. I also call your attention to the fact that the general order and sequence of all the matters referred to in both are substantially the same; would not these coincidences of expression suggest to your mind a probable connection between the Hull manuscript and the sketch in the history?

Ans. It does, as I admitted before. He must have had the penciled paper to copy from. It is called the Hull manuscript, but I don't know where it came from.

[*All but the first six words objected to by Mr. Hill, as irresponsive.*]

Recess for lunch until two, P. M.

DECEMBER 6, 1882, 2, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Cross-examination of James D. Scott, by Mr. Hill, continued.

Cross-Q. 110. Who prepared the material for Mr. Gorgas' biographical sketch?

Ans. I don't recollect, if I do know.

Cross-Q. 111. You have stated that you had to bring some suits for the collection of your subscriptions for that history; was there not a good deal of dissatisfaction with it among the subscribers; and did they not very generally complain that it did not conform to the representations that had been made to them to induce them to subscribe?

Ans. Not very much—generally satisfactory.

Cross-Q. 112. How many suits did you have to bring to collect subscriptions?

Ans. I don't remember the number—not very many.

Cross-Q. 113. Had you any attorney in Cumberland county; if so, mention the names of all?

Ans. I had one attorney in Carlisle, S. M. Leidich.

Cross-Q. 114. How many subscription accounts and notes did you have to put in his hands for collection?

Ans. I don't remember the number.

Cross-Q. 115. A good many?

Ans. Several, not very many compared with the list, the usual percentage of delinquents.

Cross-Q 116. What is your usual percentage of delinquents?

Ans. I can't say any definite amount, sometimes more, sometimes less.

Cross-Q. 117. How many subscribers did you have for the history in Cumberland county?

Ans. About four hundred.

Cross-Q. 118. Did you bring as many as forty suits to collect subscriptions?

Ans. No, sir; I think not.

Cross-Q. 119. Did you put as many as forty of them into your attorney's hands for collection?

Ans. I don't remember. There may have been claims up to that number placed with him—that I hadn't time to go to see them again.

Cross-Q. 120. How were the books delivered to subscribers, and who delivered them?

Ans. They were mostly delivered by the agents. I delivered some myself in the boroughs and towns.

Cross-Q. 121. Who delivered Daniel Drawbaugh's to him, and when?

Ans. I think it was delivered by a Mr. Foust, in the early part of 1879.

Cross-Q. 122. What is Mr. Foust's full name and where does he reside?

Ans. Robert G. Foust; resides in Philadelphia.

Cross-Q. 123. When did you first talk to anybody connected with this suit in any way about the matters referred to in your testimony; and who was it?

Ans. I don't remember when it was, but it was probably over a year ago. Mr. John C. Comfort called upon me at my residence. That was the first conversation I had about this matter.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 6th day of December, 1882.

FRED. M. OTT,
Examiner.

JAMES D. SCOTT.

ROBERT G. FOUST, *being produced, sworn and examined, saith:*

Examined by Mr. Storrow.

Q. 1. State your age, residence and occupation?

Ans. Thirty-one years of age; residence, 1025 Wallace street, Philadelphia; and business now, the asphalt paving block and roofing business.

Q. 2. Look at the history of Cumberland county, which has been referred to in the testimony, and tell me whether you know Mr. James D. Scott, the publisher of it, and how long you have known him?

Ans. I recognize this as the history that was published by Mr. Scott; I have known him since either the latter part of 1873, or the beginning of 1874.

Q. 3. How long have you been connected with the publication of maps or county publications, and with whom, and in what capacities?

Ans. I was connected with G. M. Hopkins for nearly three years as surveyor and draftsman, and with Mr. Scott at different times for a period of about six years in the capacity of surveying, drafting, canvassing, delivering and collecting.

Q. 4. Were you employed by Mr. Scott in connection with the publication of this history of Cumberland county, and if so, in what capacity?

Ans. Yes, sir; in soliciting subscribers for the book and the views contained therein, and in the delivery of the work and collection of the money.

Q. 5. What part of the county did you canvass for subscribers?

Ans. Principally in the north-western portion of the county and a portion of the territory lying between Carlisle and Mechanicsburg, north and south.

Q. 6. Did you deliver the histories in the eastern part of the county, including Lower Allen township?

Ans. I did.

Q. 7. Did you deliver the history to Mr. Daniel Drawbaugh, of Eberly's Mills, whose name appears in the subscription book of Mr. Scott?

Ans. I did.

Q. 8. There has been produced in evidence (see Scott's deposition, p. 719) a promissory note of Daniel Drawbaugh for ten dollars, dated Feb. 27, 1879, to the order of James D. Scott; in whose handwriting is the manuscript part of the body of that note?

Ans. In my own handwriting.

Q. 9. Did you receive that note from Mr Drawbaugh yourself, and did he sign the note in your presence?

Ans. Yes, sir.

Q. 10. When you delivered this history to Mr. Drawbaugh, did you or not deliver to him a copy which had at the end the various biographies, including his?

Ans. The copy I delivered to Mr. Drawbaugh included his biography.

Q. 11. Where was this that you delivered it to him?

Ans. In his mill at Eberly's Mills.

Q. 12. When you delivered it to him, did you or not show him the sketch of Milltown, on page 201, and his biography over at the end of the book?

Ans. Yes, sir; he looked at both of them.

Q. 13. Did he make any complaint or remark about either, and if so, what was it?

Ans. After reading his biography he said, "Oh, this is not as long as the one I sent."

Q. 14. Did he or not accept the book on that occasion before you left the shop?

Ans. He did.

Q. 15. Did you leave the book with him or take it away with you on that occasion?

Ans. I left it with him.

Q. 16. Did he pay for the book on that occasion, or not?

Ans. He did not.

Q. 17. Will you state what passed between you and him on that occasion about paying for the book—what was done about it?

Ans. He said he did not have the money ready, but offered to give his note. I told him it was a small matter; that I would rather have the money; and, as I was not through with that section of the county, I would leave it for a few days, and call again. I called once or twice after that, and he still not having the money ready, I concluded to accept his note, which he gave.

Q. 18. This note is dated February 27, 1879; is it the note that he gave you for the book?

Ans. Yes, sir; it appears to be the identical note.

Q. 19. Was, or was it not, dated the day it was given?

Ans. Yes, sir; on the same day. He signed it immediately after I filled it up.

Q. 20. When Mr. Drawbaugh remarked upon the length of his biography in the book, as you have stated, did you make any reply to that remark; and, if so, what did you reply?

Ans. I told him that his was like many others, too long and too expensive to print. That we did considerable culling out of the manuscripts sent us, but that his contained all the essential points that he had sent, when he remarked: "I suppose it's all right."

[*Respondents' counsel objects to the whole deposition, as irrelevant, immaterial, and not in rebuttal; and, without waiving any of said objections, cross-examines de bene esse.*]

Cross-Q. 21. How long have you lived at 1025 Wallace street?

Ans. A little more than a year.

Cross-Q. 22. Where did you live next before that, and from what time to what time?

Ans. Prior to moving there I lived at 617 Vine street, Philadelphia, from about the 1st of October, 1881, to the time I moved to Wallace street.

Cross-Q. 23. State the time when you moved to Wallace street.

Ans. About the 14th of November, 1881.

Cross-Q. 24. Where did you live next prior to living at 617 Vine street, and from what time?

Ans. In Atlantic City, from the 7th of June, 1881.

Cross-Q. 25. Where did you live next prior to living at Atlantic City, and from what time?

Ans. In Carlisle, Cumberland county, from December, 1879, with the exception of a short period when I remained in Philadelphia, prior to going to Atlantic City, on June 7.

Cross-Q. 26. State more definitely the place of your residence in Carlisle.

Ans. I was proprietor of the "Bentz House," now known as the "Florence Hotel."

Cross-Q. 27. Where did you live next prior to living at Carlisle, and from what time?

Ans. I made Philadelphia my home, when not traveling, for about ten or twelve years.

Cross-Q. 28. What was your place of residence in Philadelphia during that ten or twelve years' time?

Ans. I boarded at several places during that period. I boarded with my brother-in-law most of the time, on North Sixth street, and also on North Seventh.

Cross-Q. 29. Mention the streets and numbers of all the places where you boarded during that time, and the names of the proprietors of the houses.

Ans. On North Sixth street. I can't remember the numbers—twenty-two hundred and something—eight or ten or along there somewhere—and then another number in the same block on the same street, higher up. I can't tell that number. H. R. Alderfer is the name of the proprietor of both numbers. He is my brother-in-law. The last place, prior to moving to Carlisle, was 2214 North Seventh street, with the same party.

Cross-Q. 30. How long have you been in the asphalt paving-block and roofing business?

Ans. Since last March, (1882.)

Cross-Q. 31. What business were you in immediately prior to that?

Ans. Keeping books.

Cross-Q. 32. Where, and for whom, and how long?

Ans. On the corner of Seventeenth and Wallace streets, Philadelphia. A four months, more or less For F. M. Bush.

Cross-Q. 33. What business were you engaged in next before keeping books for Mr. Bush?

Ans. I was connected with the Stockton Hotel, Atlantic City.

Cross-Q. 34. In what capacity?

Ans. Room-clerk, cashier, and had a general supervision of the books.

Cross-Q. 35. Who was the proprietor of that hotel at that time?

Ans. Walter H. Kirk.

Cross-Q. 36. What business were you engaged in next before being connected with the Stockton Hotel?

Ans. I was proprietor of the Bentz House, Carlisle.

Cross-Q. 37. What business were you engaged in next before keeping the Bentz House?

Ans. I was canvassing for publication of local works.

Cross-Q. 38. How long were you engaged in that business?

Ans. At different times since 1870 or 1871.

Cross-Q. 39. For what different local publications, besides this history, did you ever canvass; and give the names of their several proprietors, or the persons by whom you were employed, and for whom you worked?

Ans. The "Atlas of Bucks County," the "Atlas of Montgomery County," in Pennsylvania; and the "Atlas of Burlington County" in New Jersey; maps of the cities of Long Branch, Atlantic City, and Cape May, all by James D. Scott. The "History of Franklin County," Pennsylvania, by D. F. Purcell. The "History of the Jersey Coast," by Woolman & Rose. That is about all, I believe, that I can recall that I canvassed for.

Cross-Q. 40. When were you first spoken to by anybody on behalf of complainants in this case, respecting any information you might have about Mr. Drawbaugh, or any facts relating to the subject of your testimony; and by whom were you so spoken to?

Ans. It was some time last October by Mr. Storrow.

Cross-Q. 41. How long have you known Daniel Drawbaugh?

Ans. I never met him to my knowledge prior to delivering his history.

Cross-Q. 42. Have you ever seen him since the time when you took that note from him?

Ans. I have no recollection of meeting him since.

Cross-Q. 43. Had you ever heard of him before you went to deliver that history to him: if so, when first did you hear of him?

Ans. I think I heard his name mentioned by some parties in Mechanicsburg in connection with a very fine clock, about two or three weeks probably before I went to his place; and I was told that when I got to Eberly's mills it would be worth my while to stop at Drawbaugh's mill to see the clock.

Cross-Q. 44. Do you remember who told you that?

Ans. I can't recall any particular name, but think I heard it spoken of by more than one person.

Cross-Q. 45. How many times were you at Drawbaugh's shop from the time of delivering the history to the time of receiving the note, and including those two visits?

Ans. Not more than three or four times.

Cross-Q. 46. Did you see any electric clock there when you were there?

Ans. I saw what he said was an electric clock.

Cross-Q. 47. What else did you see there?

Ans. Quite a number of things, I suppose, that I couldn't enumerate now.

Cross-Q. 48. Did you see any telephones there?

Ans. I can't remember whether I did, or not. I saw something lying on the work-bench which looked like a tube, about four or six inches long—probably longer—and about two inches in diameter, with a cord or string attached to one end.

Cross-Q. 49. Was the subject of telephones mentioned while you were there?

Ans. I think it was.

Cross-Q. 50. Do you clearly recollect whether it was, or not?

Ans. That is my recollection.

Cross-Q. 51. How came the subject to be mentioned?

Ans. I can't remember whether I called his attention to it, or he mine.

Cross-Q. 52. At which visit was that subject mentioned?

Ans. On the first visit, I think.

Cross-Q. 53. How long were you there on that first visit?

Ans. All of a half hour, I judge—probably longer.

Cross-Q. 54. Was the subject mentioned at any other visit?

Ans. I think not.

Cross-Q. 55. How many of the histories did you have present with you in the shop when you delivered to Mr. Drawbaugh his copy—any more than that one copy?

Ans. That is all; one copy.

Cross-Q. 56. Was any one present with you at the time, except Mr. Drawbaugh?

Ans. Part of the time. A man passed through the room once or twice while we were talking, and, I think, he directed him to do something about the mill.

Cross-Q. 57. Did you take any of the histories there into his shop at any subsequent call which you made upon him?

Ans. No, sir.

Cross-Q. 58. Then you never had but that one copy in his shop at any time, did you?

Ans. That is all.

Cross-Q. 59. And that was the copy that was delivered to Mr. Drawbaugh and received by him on his subscription, was it?

Ans. Yes, sir.

Cross-Q. 60. Have you stated all of the conversation with Mr. Drawbaugh at that interview, that you can remember?

Ans. He said considerable about his clock, but I can't remember much of the conversation outside of the business for which I called on him.

Cross-Q. 61. How came mention to be made of the shortness of the biographical sketch in the history?

Ans. He mentioned that; I didn't.

Cross-Q. 62. How came he to mention it?

Ans. I don't know, unless he thought his manuscript would make a larger show in print.

(*All after the words "I don't know" objected to by Mr. Hill as irresponsive and mere supposition.*)

Cross-Q. 63. Was he looking at the biographical sketch in the history when he made that remark about its being short?

Ans. He was.

Cross-Q. 64. Are you aware that he still has that copy of the history in his possession, which you delivered to him, and that it does not, and never did contain any biographical sketch of Daniel Drawbaugh?

Ans. I am not.

Cross-Q. 65. Do know anything of any advantage to the defendants in this case, or to Mr. Drawbaugh; if you do, state what it is?

Ans. Nothing, unless it is in reference to the telephones I saw there, or what were called telephones; I have reference to those tubes that I described.

Cross-Q. 66. Were they called telephones?

Ans. That is what I understood during our conversation in the shop at that time: at least my recollection is that he referred to those.

Cross-Q. 67. You don't remember just what he said about them, do you?

Ans. I can't recollect the conversation sufficiently to repeat it.

Cross-Q. 68. Didn't Mr. Drawbaugh at that time complain that the history did not come up to the representations that had been made to him about it, to induce him to subscribe?

Ans. He may have made some remark, I can't recollect. There were several remarks of that kind made by others, and Mr. Drawbaugh may have been one of them.

Cross-Q. 69. You have given one remark that he made, will you please state any other remark that he made during that conversation giving his words?

Ans. After he said it was shorter than he expected to see it, and I explained the reason to him he said he supposed it was all right, but he couldn't pay for it and offered to give his note, which I refused to take at that time. We then went through the mill, when a general conversation may have occurred to which I paid but little attention.

Cross-Q. 70. Will you repeat again the remark which he made about the biography being shorter than he expected, giving his very words ?

Ans. My recollection is, that he said "Oh! it is shorter than the one I sent"—that is the recollection I have of it.

Cross-Q. 71. Can you swear that he did not say "Oh! it is shorter than the one that was sent," instead of the words "Oh! it is shorter than the one I sent?"

Ans. My recollection is that he used the phraseology that I have just given.

Cross-Q. 72. Explain how your recollection is so very particular about the exact phraseology of this one remark, and so very uncertain about what else was said in that half hour or more.

Ans. That part of the conversation was directly connected with my business whilst the other was not; I being in a hurry to get through with my work, wanted to get away as soon as I could and made such answers to his explanations of his clock and other things in the mill as I thought proper; and did not impress my mind with them.

Cross-Q. 73. How long were you and he on that visit conversing on the subject of your business there.

Ans. Probably about fifteen minutes, more or less.

Cross-Q. 74. Give the entire conversation exactly as it occurred, so far as it related to your business there ?

Ans. I don't think we had any conversation except what I have already given, directly with my business, except a few general remarks that may have been made about the history whilst he was looking at it

Cross-Q. 75. State those general remarks about the history, so far as you remember them.

Ans. I think his remarks were confined to making comments on the sketches that were in the book; he would pick out some of those he would recognize; I can't remember the words used in the conversation, but the time was chiefly spent in looking through the work.

Cross-Q. 76. Do you remember his saying anything about an agreement or promise that he should make some of the sketches for the book?

Ans. I can't recollect whether he did or not.

Cross-Q. 87. Does that idea of his sketching for the book strike you as a new one or as one you had heard before now ?

Ans. It is one that I had heard before now, but I can't recollect who has mentioned it to me, and I wouldn't like to swear that Mr. Drawbaugh did not mention it or say something about it at the time.

Cross-Q. 78. Don't you recollect that he mentioned that as one reason why he did not want to take the book?

Ans. He never said he didn't want to take the book.

Cross-Q. 79. How many of these histories did you deliver to different subscribers?

Ans. I can't remember exactly, but I think between two and three hundred; may be more.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 6th day of December, 1882.

FRED. M. OTT.
Examiner.

R. G. FOUST.

Adjourned until December 7, 1882, at ten, A. M.

LEVI MAISH, *being produced, sworn, and examined, saith:*

Examined by Mr. Storrow:

Q. 1. State your age, residence, and occupation.

Ans. I am forty-five years of age; a lawyer by profession; and reside in York, Pennsylvania.

Q. 2. When were you in Congress, and for how long?

Ans. I was elected to Congress in the autumn of 1874, and again in 1876. I served four years in the lower house of Congress.

Q. 3. Do you know Urias R. Nichols, of Newbury township, York county?

Ans. Yes, sir.

Q. 4. Did he, at any time, have any conversation with you, or make any communication to you, concerning Daniel Drawbaugh, of Eberly's Mills, or concerning any speaking telephones which he said had been made by Mr. Drawbaugh?

[See pages 93 and 97 of respondents' printed record.]

Ans. Yes, sir.

Q. 5. Please state what he told you on those subjects, as near as you can recollect.

[*Objected to by Mr. Hill, as hearsay and incompetent, and not in rebuttal.*]

Ans. To the best of my recollection, he told me that he visited the shop of Daniel Drawbaugh in Cumberland county; and among other things he described as having seen there was the telephone. I don't know that he called it a telephone. He told me that Drawbaugh showed this telephone to him, and told him that it was connected with his house, and asked him to speak into it, which he did, as he told me. He asked the time of day, as I remember, and he told me he was answered. That is all that I can now recall concerning the conversation about the telephone. I believe there was more, but I do not remember what it was.

Q. 6. Did he tell you about any other things that he had seen at Drawbaugh's shop; and, if so, please mention some of them?

[*Objected to by Mr. Hill, for the same reasons as before.*]

Ans. I had several conversations with Nichols about Drawbaugh's inventions; my belief is, that he told me about an electric clock at the same time that he described the telephone to me.

Q. 7. Was Cumberland county in your congressional district?

Ans. It was part of my congressional district.

Q. 8. At the time Mr. Nichols first told you about Drawbaugh's telophone, had you read of telephones in the newspapers, or had your yourself used electric speaking telephones?

[*Objected to by Mr. Hill as irrelevant, immaterial and not in rebuttal.*]

Ans. My recollection is, that Nichols' account of Drawbaugh's telephone was not the first knowledge I had of the subject; I believe that I both read about and saw telephones before that.

Q. 9. Will you state where and under what circumstances you had seen telephones before Mr. Nichols first told you of Drawbaugh's telephone?

[*Same objection.*]

Ans. At Washington, D. C. I was invited by a Mr. Painter, a newspaper correspondent at Washington, to visit the office of a Mr. Maynard—I believe that is his name—opposite the Riggs House on G street, to witness an experiment to be made with telephones. I went there. It was in the evening. Of course, I don't know, excepting from what I was told, where the other end of this telephone line was; but I conversed with the Hon. James G. Blaine and others through that telephone there exhibited; and, also, there were experiments made with musical instruments. My recollection is that the one was a small music-box, and the other sounded to me like a hand-organ. I saw none of the musical instruments. They were at the other end of the line. I was informed that the other end of the line was at the house of Mr. Painter, in Washington city. I was told it was about a quarter of a mile distant.

Q. 10. If you had any talk with Mr. Blaine about that exhibition, the next day, will you please state what, and where it was?

[*Objected to Mr. Hill, as hearsay, irrelevant, and immaterial.*]

Ans. I met Mr. Blaine on the following morning in Galt's jewelry store in Washington; and, after exchanging salutations, I said to him that I supposed I had had the pleasure of conversing with him last evening, without his knowledge, or words to that effect. He asked me how that was, and I told him that I was at the other end of the telephone line when he spoke into it; and I informed him that I distinctly recognized his voice. He then told me that he was there, and spoke through it. I don't know that this is the exact language of our conversation, but what I have given is substantially what occurred between Mr. Blaine and myself.

Q. 11. You say that your recollection is that you had taken part in this exhibition at Mr. Maynard's before Mr. Nichols first told you about Mr. Drawbaugh's telephone; how strong is your recollection on that point? How sure do you feel about it?

Ans. I feel certain I had no such knowledge of the existence of Drawbaugh's telephone, as Nichols described it to me, before reading newspaper accounts of Bell's and Edison's telephones, and witnessing the experiment that I have described.

Q. 12. In your fifth answer, you have testified to what Mr. Nichols told you about Drawbaugh's telephone. If such a statement had been made to you before you had ever heard of telephones elsewhere, would it, or would it not, have made an impression on your mind?

[*Objected to Mr. Hill as hypothetical, and calling for mere opinion.*]

Ans. I think now it would have made a deep impression. Mr. Drawbaugh was a constituent of mine, and, I believe, I would have regarded the invention as one of very great importance, if I would have had such a description of it as I remember Nichols gave me.

Q. 13. If you had had such a description of the work of one of your constituents given to you a year or two before you had heard of such inventions elsewhere, and before the exhibition at Washington which you have referred to, do you think you would have mentioned it at the time of said exhibition?

[*Objected to by Mr. Hill as hypothetical, argumentative, and as calling for mere opinion.*]

Ans. Provided I had recollected it, I think I certainly would have mentioned it.

Q. 14. Please give me some idea of the shape of the telephone which you used on that occasion at Mr. Maynard's.

Ans. They were loose boxes attached to the wire—I mean not fixed to the wall or table—about eight inches in length and about five inches broad and about five inches high; I am not clear about the size; the box had a tube attached to it in which we spoke and at which, I think, we also listened.

Q. 15. Do you remember whether or not at that exhibition you heard through the instrument singing by a female voice?

Ans. Mr. Maynard was present and I think several other gentlemen and we all listened turn about; I have no recollection of hearing the singing, but I have an indistinct recollection that one of the others said he heard it.

Q. 16. Do you recollect whether they said that the singing, if there was any, was by a man's voice or by a woman's voice?

Ans. I have no recollection about that.

Cross-examined by Mr. Hill:

Cross-Q. 17. Have you stated all that you can remember of the conversation with Mr. Nichols concerning Drawbaugh's telephones?

Ans. All that I certainly remember of the first conversation that I mentioned.

Cross-Q. 18. Did you tell Mr. Nichols in that conversation of ever having seen or heard anything concerning telephones before?

Ans. I have no recollection that I did.

Cross-Q. 19. Where did that first conversation with Mr. Nichols take place, and who was present?

Ans. It took place in my office; I have no recollection of anyone being present.

Cross-Q. 20. How many times have you talked with Mr. Nichols concerning the Drawbaugh telephone, so far as you can remember?

Ans. About three or four times, I think.

Cross-Q. 21. When did those conversations take place and who was present at any of them?

Ans. All of them, I believe, in my office; I can't tell now who was present at any of them, or whether any one was present at any of them. Mr. Nichols was a client of mine and I was engaged in getting a patent for him at the time of some of these conversations, and that brought him frequently to my office; of course there were frequently persons in my office, but who they were I don't know.

Cross-Q. 22. Was it in connection with that patent-right that he was at your office, at the time that you had that first conversation with him relative to Drawbaugh's telephones?

Ans. I don't remember that: I don't remember whether that first conversation was before, or after I was engaged in getting that patent-right.

Cross-Q. 23. Do you remember what the invention was about which he was conferring with you relative to obtaining a patent-right through the Messrs. Evans?

Ans. Yes, sir; it was a patent dump-cart.

Cross-Q. 24. Do you remember whether the patent was granted or not, and if yea, have you any recollection as to the time when it was it issued or about the time?

Ans. The only knowledge I have upon the subject is what Nichols told me; he told me, I think, within a year that the patent-right was granted; at what time, I think, he did not tell me.

Cross-Q. 25. Is it not possible that there was another conversation between you and Mr. Nichols in which the Drawbaugh telephone was mentioned, a long time prior to the first conversation which you now recall to memory, and which prior conversation you may have totally forgotten, perhaps by reason of its being at such an early date?

Ans. Yes, it is possible, but I don't think probable, that I had one of such minuteness as I have detailed.

Cross-Q. 26. I do not make my meaning quite clear to you, I see; what I mean is this: Assuming, for the purposes of this question, that the conversation which you remember with so much minuteness is the first which you are able to recall to memory at this time, and assuming that Mr. Nichols has testified that he mentioned Drawbaugh's telephone to you in the winter of 1875, at your office, is it not possible that Mr. Nichols' recollection may be correct; and that he may have made some mention of that telephone to you, at your office in the winter of 1875, but perhaps not so fully as to excite any very great interest on your part: and that by reason of seven years or more intervening since then, you may have totally forgotten about that conversation and been able to recall to memory only long subsequent conversations?

Ans. Yes, sir; that is possible.

Cross-Q. 27. You have had some acquaintance with Mr. Nichols, I perceive. Have you never observed that he is gifted with a remarkably fine memory of events?

Ans. I have not had opportunities of discovering that fact, but I think he has a good memory of events.

Cross-Q. 28. In the winter of 1874–5 you had just been elected to Congress, and I suppose you took your seat at the beginning of the long session in the subsequent December, did you not?

Ans. Yes, sir.

Cross-Q. 29. During the winter, prior to taking your seat, you were actively engaged in the practice of your profession, and had a pretty large practice on your hands, I suppose, had you not?

Ans. Yes, sir.

Cross-Q. 30. You would not, I presume, undertake at this time to remember all the different conversations you had at your office that winter, or even to remember all the different persons who called at your office to talk to you about different matters that winter, would you?

Ans. Certainly not.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 5th day of December, 1882.

FRED. M. OTT,
Examiner.

LEVI MAISH.

Recess for lunch until 2, P. M.

DEC. 5, 1882, 2, P. M.

Examination resumed.

Present, same counsel, with the addition of Mr. Smith for complainants.

GEORGE C. MAYNARD, *being produced, sworn, and examined, saith*:

Examined by Mr. Storrow.

Q. 1. What is your age, residence, and occupation?

Ans. Forty-three; my residence is Washington, D. C.; my occupation is electrician.

Q. 2. What was your occupation in the last half of the year 1877: and did you at that time have anything to do with the speaking telephones made and licensed by Alexander Graham Bell and his associates?

Ans. I was engaged then in Washington, D. C., at 1423 G street, North-west, opposite the Riggs House, in a general electrical and telegraphical business; I was the sole agent for the District of Columbia for the telephones referred to.

Q. 3. Did you, during the fall of 1877, put up and operate a telephone line between your office and Mr. Painter's house in Washington; and if so, will you please give the date when that line was first put up and first used, referring to any memoranda made by you at the time which give the date?

Ans. I operated a line between those two points, a portion of which I constructed and connected with an old line already constructed. The old line extended along 14th street, from G to I street, North-west; I connected that with a wire running from 14th and G streets to my office, and run a wire across I street into Mr. Painter's house, on the corner of 14th and I streets. The date at which that line was completed between the points named was Saturday, October 13th, 1877; and the first day it was used, to the best of my knowledge, was Monday, October 15th, 1877.

Q. 4. After that line was completed, will you state whether or not Mr. Painter was in the habit of bringing Congressmen and others to witness and take part in the transmission of speech over it?

[*Objected to by Mr. Hill, as immaterial.*]

Ans. He was.

Q. 5. Do you know Col. Levi Maish, at that time member of Congress; and did he ever come to your office, and witness, or take part in, the transmission of speech over that line?

Ans. Col. Maish came to my office, and examined the telephones, and took part in operating them. I think I had no acquaintance with him before that time.

Q. 6. If you have here your memorandum-books for that period, will you please point out to the examiner all the entries that relate to the construction of that line, and all the use of telephones connected with it, during the month of October, 1877.

[*Respondents' counsel states that to save time he admits that* *the line was operated in the month of October, 1877, in Col. Maish's presence, as Col. Maish has described; but that he objects to the whole matter as immaterial, and not rebutting.*]

Cross-examined by Mr. Hill:

Cross-Q. 7. Are you still connected with the telephone business?

Ans. Yes.

Cross-Q. 8. What connection have you with the telephone business?

Ans. I am a stockholder in the National Capital Telephone Company, and it is a part of my business to sell wires, and to construct telephone lines.

Cross-Q. 9. Is that company operating under the patents of A. G. Bell?

Ans. It is.

Cross-Q. 10. What kind of transmitters does that company use?

Ans. The company uses Blake transmitters.

Cross Q. 11. The Blake transmitter is a form of carbon telephone, is it not?

Ans. Carbon is used in the construction of the Blake transmitter.

Cross-Q. 12. It operates with a battery, and a variable resistance in the circuit, does it not?

Ans. It operates with a battery. I don't quite understand the question as to variable resistance.

Cross-Q. 13. Is not the carbon interposed in the circuit, and subjected to the variable pressure of the diaphragm, when the machine is in operation?

Ans. It is.

Cross-Q. 14 How long has that company been in operation?

Ans. I think about a year.

Cross-Q. 15. Were you connected with any telephone companies prior to the organization of that company; if so, what ones?

Ans. I was, with the National Capital Telephone Company and the National Telephone Exchange, both of the District of Columbia.

Cross-Q. 16. When did they first begin to operate telephone lines?

Ans. I cannot give the dates from memory.

Cross-Q. 17. Have you a pretty general knowledge of the telephone business throughout the country?

Ans. I know something of the business generally, but have not given it special attention for a year past.

Cross-Q. 18. So far as you know, are not the Blake transmitters generally employed on telephone lines throughout the country?

Ans. So far as I know they are.

Cross-Q. 19. Do you know of any line equipped only with magneto instruments?

Ans. I do.

Cross-Q. 20. What line and where?

Ans. Unless very recent changes have been made in the equipments, the lines at the Columbia Institution for the Deaf and Dumb, in the District of Columbia, and a line at the Maryland Agricultural College are being worked with magneto telephones.

Cross-Q. 21. How long are those two lines mentioned in your last answer?

Ans. I think they are about one mile long.

Cross-Q. 22. Are they worked with or without batteries?

Ans. Without batteries.

Cross-Q. 23. Are those all the lines you know of that are equipped only with magneto instruments?

Ans. I do not now recall any others.

Examination taken, reduced to writing, and by the witness sworn and subscribed to before me, this 5th day of December, 1882.

FRED. M. OTT,
Examiner.

GEO. C. MAYNARD.

DECEMBER 7, 1882, 10, A. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

JACOB S. KUNKEL, *being produced, affirmed, and examined, saith:*

Examined by Mr. Smith:

My age is fifty-seven; residence, Lisburn, Cumberland county, Pennsaylvania; occupation, running a grist-mill, saw-mill, and farming a little.

Q. 1. Are you the owner of that mill, and if so, how long have you owned it?

Ans. I have owned it fifteen years in April next—since 1868.

Q. 2. Is there any other mill at Lisburn?

Ans. No, sir.

Q. 3. Has there been any other during the time that you have owned it?

Ans. No, sir.

Q. 4. Is that mill generally known as Kunkel's mill?

Ans. Yes, sir.

Q. 5. When you purchased it did you make any repairs upon it; and if so, state how extensive they were?

Ans. Yes, sir; I repaired it; I put in four new water-wheels and a bolting arrangement, all new, return bolts, and new gearing; I didn't use any of the old gearing; that is about the most; of course there were other things that were connected with it.

Q. 6. Have you run the mill yourself, ever since you purchased it?

Ans. Yes, sir.

Q. 7. Did you, when you commenced running it, employ any person as a miller; if so, state who it was first, and how long he worked for you?

Ans. Yes, sir; a man by the name of Joel Gochenauer; he worked for me two years.

Q. 8. Whom did you next employ as miller, and how long?

Ans. Peter Kunkel, one year.

Q. 9. Who was your next miller, and how long did you employ him?

Ans. Elijah Kunkel; three years.

Q. 10. And whom did you next employ, and how long a time did he work for you?

Ans. William Peck, six years.

Q. 11. During the time that you have owned and run that mill, what instruments have you employed for dressing the millstones?

Ans. Nothing but a redstaff and the common mill-picks that are used.

Q. 12. Is the redstaff used for securing a level surface for the stones when sharpened with a pick?

Ans. Yes, sir.

Q. 13. How long have you known it to be used by millers?

Ans. Since I know anything at all about it—a great many years.

Q. 14. Have you ever used in that mill any instruments for dressing millstones, which were invented or made by Daniel Drawbaugh, of Eberly's Mills?

Ans. No, sir.

Q. 15. Have you ever had any knowledge of instruments of that kind or known of burr-dressing machines that were invented, made, or sold by Daniel Drawbaugh?

Ans. No, sir; I have not.

Q. 16. Do you know Daniel Drawbaugh; and if so, how long since you first knew him; in what year was it?

Ans. In 1878—the fall of 1878.

Q. 17. How came you to know him at that time?

Ans. I went to his shop.

Q. 18. For what purpose did you go there.

Ans. I was about putting up cider works, and a man by the name of Hall told me that Mr. Drawbaugh had some sort of an idea about pressing the cider out of the pomace.

Q. 19. What passed between you and Mr. Drawbaugh in respect to the machine for pressing cider?

[*Objected to by Mr. Hill, as immaterial and irrevelant.*]

Ans. I don't suppose Mr. Drawbaugh knew me. I made myself known, and told him what I had heard. I wanted to know something about it. He told me then something about it. I just don't remember what, any more than I asked him why he didn't have a cider works there at his place, at that water-power. Mr. Drawbaugh told me then that that principle of pressing would be too expensive for that neighborhood, meaning that he wouldn't be justified in going to that expense. I wanted to know something about the expense; and he thought, if my memory serves me right, that for getting the patterns made would cost about two hundred and fifty dollars. Of course, I just dropped, it and put it up on the old principle.

Q. 20. Before you went there on that occasion, had you heard anything about any other machine or invention of Daniel Drawbaugh, if so, what was it?

Ans. Yes, sir; Mr. Kutz was carrying on a mercantile business there at my place. He used the Drawbaugh faucet. And then I heard about that electric clock. That clock I saw when I was there at Drawbaugh's shop.

Q. 21. How had you heard of this clock?

[*Objected to by Mr. Hill, as immaterial.*]

Ans. It was reported around there considerable in the neighborhood. I couldn't just say how.

Q. 22. If Mr. Drawbaugh gave you any explanation about the clock, while you were there at his shop, state what it was?

[*Same objection.*]

Ans. He just merely showed me the clock and the nature of its working.

Q. 23. Do you know Urias R. Nichols, of Newbury, and if so, how long have you known him?

Ans. Yes, sir; twenty-five years, anyhow.

Q. 24. Was he ever, to your knowledge, at your mill at Lisburn?

Ans. Not to the best of my knowledge.

Q. 25. Was he ever at your house at Lisburn? If so, how many times, and how came he to be there?

[*Objected to by Mr. Hill as immaterial.*]

Ans. He was only there once that I remember of; that is, him and his wife together. Him and his wife had been on a visit to Mechanicsburg, and I had been there, and on my home road they overtook me, and said that they were going to stop at our place for dinner. That is the only time that I recollect that he ever was there.

Q. 26. Did he take dinner with you?

[*Same objection.*]

Ans. Yes, sir.

Q. 27. On what stream is your mill situated?

Ans. The Yellow Breeches.

Cross-examined by Mr. Hill.

[*Respondents' counsel objects to the whole deposition as immaterial, and not in rebuttal; and, without waiving his objections, cross-examines de bene esse.*]

Cross-Q. 28. How long have you had four water-wheels in your mill?

Ans. For fifteen years, next April. I put them in in 1868.

Cross-Q. 29. How many run of stones have you in your mill?

Ans. Four.

Cross-Q. 30. Are they all for wheat; or some for wheat, and some for corn?

Ans. Two for chopping and two for grinding wheat.

Cross-Q. 31. What is the capacity of your mill per day?

Ans. That I couldn't tell. We don't do anything but run on custom-work.

Cross-Q. 32. How long has it been equipped with four run of stones?

Ans. It has been there ever since I have it, and it was there when I came there and bought it.

Cross-Q. 33. How many men do you employ in and about the mill, without reference to the saw-mill?

Ans. Two.

Cross-Q. 34. What is their business in the mill?

Ans. They attend to the grinding and chopping and the customers.

Cross-Q. 35. How long have you employed two men to attend to the grinding and chopping?

Ans. Ever since I had it, except may be for a week or so that there has been one, generally there has been two men.

Cross-Q. 36. What do you mean by chopping for customers?

Ans. That is making horse-feed and chop to feed cattle.

Cross-Q. 37. Coarse grinding without bolting.

Ans: Yes, sir.

Cross-Q. 38. Name all the men that you have had employed in your mill to attend to grinding and chopping, so far as you can remember, from the time when you first owned or run it to the present time?

Ans. I have only employed the one man, and they had to employ the second man; that I couldn't tell. There was Gochenauer two years: and then he had to hire the second man; sometimes they would get an apprentice, you know, to learn the trade; Peter Kunkel, one year; Elijah Kunkel, three years; William Peck, six years; then my son took the mill after Peck left, and he is in it yet, and has an apprentice.

Cross-Q. 39. Do you do any thing about the mill yourself; if so, what?

Ans. I furnish the grain—buy the grain.

Cross-Q. 40. Has that been your part of the business ever since you started to operate the mill?

Ans. No, sir; not all the while.

Cross-Q. 41. What else have you done at the mill at any time?

Ans. Kept up repairs. We had another building there where we run three circular saws—the saw-mill, and there was some farming to do—to attend to.

Cross-Q. 42. Are you a practical miller yourself?

Ans. No, sir; I never learned the trade.

Cross-Q. 43. Did you ever dress any mill stones?

Ans. I never dressed any myself. I helped dress the choppers. Never on burrs.

Cross-Q. 44. How often are your burrs dressed?

Ans. Indeed that I dont know.

Cross-Q. 45. In running a flour-mill all the time it is ordinarily necessary to dress the burrs at least once a week. Do you know whether your burrs were dressed as often as that or whether they were allowed to run undressed, without regard to the quality of the flour produced?

Ans. The time they have for dressing, that I don't know. I know they dressed them. It is their business to dress them when they need it. That I don't know. They know better than I do.

Cross-Q. 46. Do you make a good quality of flour in you mill on the average?

Ans. I suppose about as good as—I know some praise it and some have inferior wheat, and then it don't get so good. I suppose the average is about as good as can be expected.

Cross-Q. 47. How many barrels of flour and chops do you average per day in your mill?

Ans. That I couldn't tell. To sit down and tell the bushels and half bushels of corn meal, etc., is something I couldn't tell. I wouldn't like to say anything I don't know.

Cross-Q. 48. How many barrels of flour do you average per day?

Ans. That comes about under the same head—commences with very small grists and then up. I am not prepared to do that.

Cross-Q. 49. Do you use wheat-cleaning machinery in the mill, or do you run the wheat into the stones just as it comes from the farmer?

Ans. We have a Wilson smut machine and cleaner combined?

Cross-Q. 50. Do your flour stones all have the same dress, or are they dressed differently?

Ans. What do you mean by that; the draft on them or how they are laid off in sections?

Cross-Q. 51. Yes; how are they dressed?

Ans. I don't know that there is any difference in them; and yet there may be in the rigging and pitch, as one has a very large eye and the other a smaller one; yet I wouldn't say; I don't know.

Cross-Q. 52. Have they always been dressed the same as they dress them now, or do you know anything about it?

Ans. How do mean; in the grinding down and laying them off different?

Cross-Q. 53. Yes.

Ans. They have never been ground down and laid off different since I had them; if they have been I don't know it.

Cross-Q. 54. Is the dress of the chop stones the same as that of the flour stones.

Ans. I don't know whether they are laid off in the same sections as the burrs or not; I never did anything on the burrs in my life and very little on the choppers.

Cross-Q. 55. How much of the day, on the average, does your business require you to spend in the flour-mill?

Ans. I am not prepared to answer that at all.

Cross-Q. 56. Give us the best answer you can to it?

Ans. I don't like to answer anything that I have to make a rough guess on.

Cross-Q. 57. You say that you furnish the mill with grain; how do you furnish the mill with grain.

Ans. For the retail trade.

Cross-Q. 58. How do you get the grain? Is it brought to you at the mill, or do you have to go around the country and engage it from farmers?

Ans. It is brought there and we buy it; sometimes we go and see people, but it is very seldom that we need to go away anywhere for it?

Cross-Q. 59. How far is your farm from the mill and how long have you been farming it?

Ans. The mill is right on the property; the land runs along the creek above and below; there is only thirty-seven acres; we have been farming it ever since we are there—since 1868.

Cross-Q. 60. Do you live on the farm?

Ans. Yes, sir.

Cross-Q. 61. And have ever since you have been running the mill?

Ans. Yes, sir.

Cross-Q. 62. Do you personally attend to the farming?

Ans. Not just all the while myself.

Cross-Q. 63. Do you personally attend to the business of the saw-mill?

Ans. I do.

Cross-Q. 64. Have you any other business besides grain-milling, saw-milling, and farming?

Ans. No, sir.

Cross-Q. 65. Have you always made it your business to go into the mill every time the stones were dressed and see what instrument they were dressed with?

Ans. No, sir.

Cross-Q. 66. Do you suppose you have particularly noticed the instrument they were dressed with, half the times that they have been dressed, since you have been at the mill there, so that you could state on oath whether it was one instrument or another?

Ans. I never seen any instrument only the one specified there—the redstaff. I don't know whether I seen them dress the stones half the times; I couldn't say in regard to that.

Cross-Q. 67. Do you know of anything to prevent a miller or his assistant from bringing in some other instrument and dressing the stones with it, at some time or times, or from allowing somebody else to do so?

Ans. I do not.

Cross-Q. 68. Did you ever see Drawbaugh's millstone dressing instrument?

Ans. I did not.

Cross-Q. 69. Then you wouldn't know one of them if you saw it, so far as you are able to swear, would you?

Ans. No, sir.

Q. Q. 70. Do you know anything to prevent Mr. Nichols from having been at your mill a good many times without your seeing him or knowing that he was there?

Ans. No, sir.

Redirect by Mr. Smith:

Cross-Q. 71. How far is Newbury from Lisburn?

Ans. Nine miles.

Re-cross by Mr. Hill:

Re-cross-Q. 72. Is Lisburn on the road between Newbury and Harrisburg?

Ans. Yes; only it is a good bit too high up you know; yet he might go that way; his direct road from Newbury town is by way of New Cumberland.

Re-cross Q. 73. But the road by way of Lisburn is a better road and avoids the mountains more; is not that the fact?

Ans. He hasn't as big a mountain to cross; I don't know that it is any better, with the exception that the mountain is a little harder by way of New Cumberland; after reaching New Cumberland you have the pike.

Re-cross-Q. 74. And after reaching White Hill station or a little beyond by the other road you have the pike, have you not?

Ans. Yes, sir.

Re-cross-Q. 75. And for about the same distance?

Ans. It is about a mile by going through Milltown, and about two miles from New Cumberland to Bridgeport—I think they call it. There would be about a mile difference, I guess.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me this 7th day of December, 1882.
FRED. M. OTT,
Examiner.

JACOB S. KUNKEL.

Recess for lunch, until two, P. M.

DECEMBER 7, 1882, 2, P. M.

Examination resumed.

Present, Mr. Smith for complainants, and Mr. Hill and Mr. Jacobs for respondents.

JOEL GOCHENAUER, *being produced, affirmed, and examined, saith:*

Examined by Mr. Smith:

My age is sixty-two years. My residence is Washington township, York county, Pennsylvania. Occupation, miller.

Q. 1. Were you ever employed as miller in Mr. Kunkel's mill at Lisburn; and, if so, when, and how long?

Ans. Yes, sir. I came there in the spring of 1868, and was there till the spring of 1870—two years.

Q. 2. Did you have charge of the running of the mill?

Ans. Yes, sir.

Q. 3. Who did the dressing of the stones when they required dressing?

Ans. I did superintend the whole of it.

Q. 4. What instruments did you use in dressing the stones, or in leveling them?

Ans. I used nothing but a spirit-level to level the stones, and an old-fashioned redstaff to bring the face even, and old-fashioned millpicks.

Q. 5. Did you have any instrument of your own for trueing the redstaff, if it required to be made true; and, if so, what was it?

Ans. Yes, sir; an iron proof-staff.

Q. 6. Did you, before you took charge of that mill, know of an instrument, invented or made by Mr. Daniel Drawbaugh, to be used in connection with dressing mill-stones? If so, what was it, and what was it called?

Ans. I saw a machine—I called it a redstaff—to make the face true of the stones.

Q. 7. How long before you went there had you known of that instrument?

Ans. To the best of my knowledge it was in 1863.

Q. 8. Was that instrument or any instrument invented or made by Mr. Daniel Drawbaugh, used in dressing the mill-stones at Mr. Kunkel's mill, while you had charge of it?

Ans. No, sir; I used nothing but the common redstaff and mill pick.

Q. 9. Do you know Mr. Urias R. Nichols, of Newbury?

Ans. No, sir.

Cross-examined by Mr. Hill.

Cross-Q. 10. What assistance did you have while you were running the mill?

Ans. I had a hired hand.

Cross-Q. 11. Did you have the same hand all the time or different hands?

Ans. No, sir; I had two different hands.

Cross-Q. 12. Didn't you have more than two?

Ans. No regular hands. I had sometimes for a week or sometimes for a few days, that I had hired extra hands.

Cross-Q. 13. What did your hired hands do?

Ans. They helped to dress the chopping stones, but never helped to dress the burrs, and they helped to do most of the work.

Cross-Q. 14. Your charge of the mill was from 1868 to 1870, was it?

Ans. Yes, sir; from the 1st of April, or near that time, until the 1st of April, 1870.

Cross-Q. 15. How often did you have to dress or clean the stones?

Ans. That is more than I can tell you. I can't tell how often we dressed them—just according what kind of grain we ground. If we ground garlic grain we had to clean them every day sometimes, and sometimes every two or three days, and sometimes not for a month.

Cross-Q. 16. Do you remember every time the stones were dressed while you were there?

Ans. I don't remember it; I was present all the times when they were dressed, but I couldn't give you the date of it.

Cross-Q. 17. Do you remember everybody who was present every time that the stones were dressed while you were there?

Ans. No, sir.

Cross-Q. 18. You were pretty familiar, I suppose, with Drawbaugh's mill-stone dressing instrument, were you not; that is, you knew what it was, and how it was used, did you not?

Ans. I only saw it once, and I never saw it used on stones.

Cross-Q. 19. Might you not have seen it used on stones and have forgotten it after a lapse of more than twelve years?

Ans. No, sir; I am certain that I never used them and never saw anybody else use them.

Cross-Q. 20. When did you go to work in that mill?

Ans. In the spring of 1868.

Cross-Q. 21. From the spring of 1868 to the first of April, 1870, were you on duty in the mill every day of the whole time?

Ans. No, sir.

Cross-Q. 22. How much of the time were you off duty?

Ans. That is more than I can tell you; there was sometimes a half a day and sometimes a day that I was out of the mill.

Cross-Q. 23. How do you fix the dates of your beginning and ending work there?

Ans. I come there—and it is generally the rule when you go to a mill or any place that way, to go on the first of April; I don't know whether it was exactly the first of April, but it was close to it, and the same way when I left; I was to take charge on the first of April, but I don't know whether it was the first or second, and the same way when I left.

Cross-Q. 24. You say you saw Drawbaugh's redstaff in 1863; where did you see it?

Ans. I saw it either at Drawbaugh's shop or else at the mill my brother run, close—about a mile from there.

Cross-Q. 25. You can't remember which place you saw it at, can you?

Ans. No, I can't remember any more.

Cross-Q. 26. How did you happen to see it; did any one have it in hand?

Ans. My brother recommended it, and we walked up to Drawbaugh's shop.

Cross-Q. 27. What did you walk up to Drawbaugh's shop for?

Ans. I don't know that; we just took a walk up there.

Cross-Q. 28. Did your brother recommend it while you were walking up to Drawbaugh's shop, or before you walked up?

Ans. I don't know.

Cross-Q. 29. What did you see at Drawbaugh's shop while you were there?

Ans. I don't remember anything but a carpet-tack machine.

Cross-Q. 30. Where was Drawbaugh's shop at that time?

Ans. At Milltown, Cumberland county.

Cross-Q. 31. Do you know where his shop is now, that is, do you know the building?

Ans. No, sir; I was never there since we was there; I could find it though, middling handy.

Cross-Q. 32. Do you remember where you found it then—what building it was?

Ans. I don't understand the question.

Cross-Q. 33. I mean, do you remember in what building Drawbaugh's shop was at that time when you were there?

Ans. It was in a building close to the mill, north-east, I think, from the mill.

Cross-Q. 34. Close to Eberly's mill do you mean?

Ans. I don't know who owned the mill; I was not acquainted at that time up there.

Cross-Q. 35. How long have you been living at Washington township, York county?

Ans. I was born there.

Cross-Q. 36. Do you mean to say that you have been living there ever since you have been born?

Ans. No, sir.

Cross-Q. 37. Well, I ask you how long you have been living there, from the last time you moved there, until the present time?

Ans. I moved there when I left the Lisburn mill, in 1870. I moved there and have been there most of my time, and had my home there.

Cross-Q. 38. Did you have a family and keep house in 1868 and 1870?

Ans. No, sir; I never had no family.

Cross-Q. 39. I suppose you don't know what kind of a mill-stone dressing instrument was in use at Kunkel's mill before the 1st of April, 1868, do you?

Ans. No, sir.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 7th day of December, 1882.

FRED. M. OTT,
Examiner.

JOEL GOCHENAUER.

ELIJAH S. KUNKEL, *being produced, affirmed, and examined, saith:*

Examined by Mr. Smith:

My age is forty-three years. Residence, Warrington township, York county. Occupation, milling.

Q. 1. Did you ever have charge of a mill at Lisburn, Cumberland county? If so, who was the owner of the mill, and during what time did you have charge of it?

Ans. I had charge of the mill of Mr. Jacob Kunkel at Lisburn. I came there in the spring of 1872. I had charge of it three years.

Q. 2. Do you know who had charge of it immediately before you?

Ans. Peter Kunkel.

Q. 3. Do you know how long he had been there?

Ans. Yes, sir; about a year.

Q. 4. Do you know who was there before him?

Ans. Joel Gochenauer.

Q. 5. Mr. Gochenauer has testified that he left the mill in the spring of 1870. If Mr. Peter Kunkel stayed there but one year, he would have left in the spring of 1871; do you think, on reflection, you went there in 1872, or may it not have been in 1871?

[*Objected to by Mr. Hill as leading, and trying to make the witness contradict himself.*]

Ans. I may have been mistaken. I was there three years. Kunkel bought the mill in 1868, and Gochenauer was there two years. I didn't count over that. That would make my time begin in 1871. I guess I came there in the spring of 1871, and was there three years.

[*Answer objected to by Mr. Hill, as hypothetical, argumentative, and based upon assumptions not proven.*]

Q. 6. While you were there, who attended to the dressing of the mill-stones when they required dressing?

Ans. I did do that myself.

Q. 7. What instruments did you use in dressing the mill-stones?

Ans. The well-known mill-pick. I never used anything else myself.

Q. 8. What instrument did you use for ascertaining when the surface of the stone was true or level?

Ans. A redstaff, the well-known redstaff that has been used for many years.

Q. 9. Were any other instruments used while you were there for dressing or leveling the mill-stones?

Ans. There had been a man there with a diamond dressing machine that he wanted to show me—how it dressed the stones—it was a machine that you draw across the stone, cutting instead of picking; he dressed a pair of stones for me with it.

Q. 10. With the exception of that diamond dressing machine, were any other instruments used in dressing the mill-stones while you were there, than the pick and redstaff you have mentioned?

Ans. No, sir; nothing more than the common spirit-level, to see whether the bed stone is laying level; it has nothing to do with the dressing of the stones; it is a machine all millers have to use.

Q. 11. While you were there did you know of any instrument used in dressing millstones, invented or made by Daniel Drawbaugh called a tram, or by any other name?

Ans. No, not of a tram; I never heard of it; it is not used for dressing a burr—a tram.

Q. 12. Have you since that time had any knowledge of any tram or any instrument used in dressing millstones, that was invented or made by Daniel Drawbaugh?

Ans. There was one man came there in the summer, to that place where I am living now, and he asked me whether I used the Drawbaugh redstaff; I never heard, before that man come and asked me that question, that there was a redstaff by that name; that is the way I understood the man; that it must have been a redstaff; that is all that I could make out of what he said.

Q. 13. Was that this last summer?

Ans. Yes, sir; this last summer after harvest.

Q. 14. Did you know Mr. Daniel Drawbaugh at that time last summer, or before?

Ans. I never was acquainted with Daniel Drawbaugh.

Q. 15. Do you know Urias R. Nichols, of Newbury, York county, Pennsylvania?

Ans. No, sir.

Cross-examined by Mr. Hill.

Cross-Q. 16. How do you know that Peter Kunkel had charge of the mill before you went there?

Ans. He is a brother of mine.

Cross-Q. 17. Well, how do you know that he had charge of the mill? Did you see him there, or did he or some one else tell you?

Ans. I had been there several times on visits and seen him there.

Cross-Q. 18. How do you know that he had charge of it just one year? Did you get that from what some one told you?

Ans. No, sir; I know it by—I moved there after he left—he was there one year; Gochenauer was there two years; there is where I made a mistake before.

Cross-Q. 19. Where did your brother work just before he took charge of Kunkel's mill?

Ans. He was at the mill then called Bair's mill, now owned by Andrew Kline, deceased, at Strinestown, Newbury township, about a mile away from Strinestown.

Cross-Q. 20. Where did your brother work immediately after he left Kunkel's mill?

Ans. Kunkel's mill, Warrington township; that is the name of the place where I now live; it has been called Kunkel's mill fifty or sixty years already; he moved from Kunkel's mill, Lisburn, to Kunkel's mill, Warrington township.

Cross-Q. 21. Where did you work immediately before you took charge of Kunkel's mill, Lisburn?

Ans. Dover township, at a place called Mount Royal, York county.

Cross-Q. 22. Whom did you work for at Mount Royal, and in what mill?

Ans. I didn't work at milling that year; I didn't work much that year.

Cross-Q. 23. Mention anybody that you worked for that year before you took charge of Kunkel's mill, Lisburn.

Ans. I could mention several; Jesse Miller, my brother-in-law, and several other farmers that I helped sometimes around the neighborhood.

Cross-Q. 24. Where did you work immediately after you left Kunkel's mill, Lisburn, and for whom?

Ans. I worked for myself. I own a farm in Dover township, York county; I moved on that. That is the same township that I moved out of when I went to the mill; but I didn't move from the same place—about two miles from there; that is, when I moved back again to the farm, I moved to a place about two miles from where I lived before I went to the mill.

Cross-Q. 25. Did you take your family with you to Lisburn?

Ans. Yes, sir.

Cross-Q. 26. Did you live in the same house all the time that you were at Lisburn?

Ans. Yes, sir.

Cross-Q. 27. What and whose house was that?

Ans. A frame house belonging to Jacob Kunkel, the owner of the mill. It was situated in Lisburn, close by the mill. It wasn't the closest house to the mill; but it wasn't very far from it.

Cross-Q. 28. In what year and month did you finish your work at the mill and move away from Lisburn?

Ans. In the spring of 1873, in the latter part of March, I moved away—1871, 1872, 1873, wouldn't that make three years? (*Mr. Smith requests that the fact that the witness is counting up the dates be noted, and Mr. Hill requests notice of the fact that the remark of Mr. Smith called the attention of the witness to the dates. Witness continues:*) That would be the spring of 1874, wouldn't it, if I came there in the spring of 1871?

Cross-Q. 29. How long had you been there at the Lisburn mill when the man came there with the diamond dressing instrument? Was it towards the beginning or end of your work there?

Ans. If I recollect right, it was the second year, after harvest, that I lived there.

Cross-Q. 30. Do you know the man's name who brought the diamond dressing instrument there and dressed two mill-stones with it, as you have testified?

Ans. No; I could't tell the man's name. I don't remember asking his name. He came there in the forenoon and dressed the bed stone and the runner. By that time it was dinner, and after that he left.

Cross-Q. 31. Describe the man, if you remember his personal appearance.

Ans. I couldn't just give you a close description of him, but he wasn't a very large man. A middle aged man I took him for.

Cross-Q. 32. Have you ever seen him since?

Ans. No, not as I know of. I might have seen him and not known him. I didn't take particular notice of his features.

Cross-Q. 33. Do you remember everybody who was present while he was dressing those stones?

Ans. No; I do not. I can't remember.

Cross-Q. 34. Did he operate the instrument himself, while the work of dressing the mill stones was going on, or did you?

Ans. He did.

Cross-Q. 35. Describe the instruments he used, as nearly as you can remember.

Ans. It was an iron thing about two feet long, and then there was a handle above, and every time he drew the instrument along there was a screw that he gave a turn to give it the width of the next cut.

Cross-Q. 36. I suppose you don't remember the name that he gave the machine, except that it was a diamond dressing machine or instrument, do you?

Ans. No, sir.

Cross-Q. 37. And you don't remember whose make the machine or instrument was, do you?

Ans. No, sir.

Cross-Q. 38. You spoke of drawing the machine along on the stone; did the man draw the whole machine along on the stone, or did he hold a part of it fast while he drew the handle back and forth?

Ans. The machine was stationary. He just drew the knife. He had to move the machine around to make another cut, for he couldn't cut all over the bed-stone from one place, as the machine was only eight or ten inches wide.

Cross-Q. 39. I understand you that there was an adjusting-screw on the machine; do you remember what that was for?

Ans. That was for to regulate the cutting.

Cross-Q. 40. To regulate the depth of the cut, or the width of the cut; do you remember which?

Ans. I suppose it was for the depth of the cut, for there was a ratchet-wheel, too. I didn't work with the machine, but, I suppose, that was to regulate the width of the cut—the ratchet-wheel.

Cross-Q. 41. This last answer is only your supposition, is it not? You do not swear positively that the screw was to regulate the depth, or the ratchet the width?

Ans. No; just to the best of my understanding—I think so.

Cross-Q. 42. The adjusting-screw had a little hand-wheel on the end of it, had it not?

Ans. I couldn't describe the machine that close, any more. I didn't examine it that closely, and it has been a good while, so I couldn't tell.

Cross-Q. 43. Did you notice that the machine made a sound or click, when it was adjusted?

Ans. Yes, sir: every cut it made a tick, like the sound of a tick of a clock.

Cross-Q. 44. There was a small base-board of wood to the machine, was there not?

Ans. I couldn't positively tell, but I think the whole machine was iron, brass, etc. There might have been some wood in it, but it is so long that I cannot tell, hardly.

Cross-Q. 45. Do you remember that when he took the machine off of the mill-stones, at the close of his work, he separated the diamond cutter from the machine, and put it in his pocket, or put that away by itself?

Ans. No, sir; I did not.

Cross-Q. 46. You mean you do not remember?

Ans. I did not take notice. It would have taken a man watching all the time. I had business going on at the time, and I attended to *my* business, too.

Cross Q. 47. In using the machine he would set it to a land, and dress that land by operating the handle of the cutter, and then move the machine to the next land and dress that, and so on around the stone; would he not?

Ans. Yes, sir; he did.

Cross-Q. 48. And in dressing one land he would move the cutter handle several times, to make the number of cuts or scores in the land, that were required, would he not?

Ans. I didn't take particular notice of that. Of course he had to move it as often on one land as there were cuts in that land.

Cross-Q. 49. Did the agent, or man, who was using the machine show you how it would operate on a piece of glass, before he put it on the mill-stone?

Ans. No, sir; I don't remember as he did.

Redirect by Mr. Smith:

Q. Q. 50. Was Kunkel's mill in Warrington township, that you spoke of, owned by your father?

Ans. Yes, sir.

Q. Q. 51. Had you ever worked in that mill before you went to Lisburn?

Ans. Yes, sir; I did.

Q. Q. 52. How long before?

Ans. It was in 1856 or 1857 I commenced working in that mill; the first milling I done. I learned my trade there.

Q. Q. 53. How long did you work there?

Ans. That I couldn't tell accurately. I was there about a year at the first start, and then I worked at different places and at different works, too. I wasn't just every year at milling.

Q. Q. 54. I believe you are now running that mill. How long have you been running it?

Ans. Five years till next spring.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me this 7th day of December, 1882.

FRED. M. OTT,
Examiner.

ELIJAH S. KUNKEL.

Adjourned until Dec. 8, 1882, at 10, A. M.

DECEMBER 8, 1882, 10, A. M.

Examination resumed, pursuant to adjournment.

Present, Mr. Smith and Mr. Storrow for complainants, and Mr. Hill and Mr. Jacobs for respondents.

JACOB S. KUNKEL, recalled.

Examined by Mr. Smith:

Q. 1. Did you know of a diamond dressing machine being brought to your mill and used in dressing a pair of stones, while Elijah Kunkel had charge of the mill?

Ans. No, sir.

Q. 2. Mr. Urias R. Nichols, in his testimony, refers to the fact that he used an artificial arm; do you know what kind of an artificial arm he wears?

Ans. I never seen him wear anything but a kind of an iron hook; he has the use of the elbow; I never seen exactly where the arm was taken off; all that I ever seen him wear was an iron hook.

Q. 3. Have you seen him use this iron hook about his work, in lifting things?

Ans. Yes, sir; I saw him haul wood, or load wood; he hauled it to his brick kiln; and then I bought some brick of him, and he got the brick out of the kiln himself, and slid them down into the wagon.

Q. 4. Is he in any way related to you?

Ans. By marriage on my wife's side.

Q. 5. Which arm is it which is the artificial one?

Ans. I think it is his right arm.

Cross-examined by Mr. Hill:

Cross-Q. 5. You don't know whether or not he had an artificial arm besides the iron hook, do you?

Ans. No, sir; I never seen it.

Cross-Q. 6. You don't know but that he uses the iron hook sometimes, now, do you?

Ans. I haven't seen him since the fifth day of August, 1882, and that time he had it.

Cross-Q. 7. Did he lose his arm in the army during the war of the rebellion?

Ans. Yes, sir.

Cross-Q. 8. Do you remember of ever hearing him refer to that hook as his artificial arm?

Ans. That I don't know.

Examination taken, reduced to writing, and by the witness subscribed to before me this 8th day of December, 1882, he having been sworn upon his previous examination.

FRED. M. OTT,
Examiner.

JACOB S. KUNKEL.

ELIJAH S. KUNKEL, *being recalled, saith:*

Examined by Mr. Smith:

Q. 1. You testified yesterday about a diamond dressing machine, which was brought to Mr. Kunkel's mill by a stranger while you had charge of it; do you remember whether Mr. Daniel Drawbaugh's name was mentioned in connection with the instrument?

[*Objected to by Mr. Hill, on the ground that the witness has already been fully examined and cross-examined on the subject of that machine and his deposition closed, and it is improper now to recall him to continue an examination on the same subject.*]

Ans. No, sir; I do not.

Q. 2. Do you mean that you do not remember hearing his name?

[*Objected to by Mr. Hill, as leading, the witness having already testified that he did not remember whether he heard it or not.*]

Ans. No, I can't remember that I heard Drawbaugh's name; I cannot.

Q. 3. Did you take up the upper mill-stone, in order to give the stranger an opportunity to try the machine?

Ans. Yes, sir; I did.

Q. 4. State whether or not he wanted to sell the machine to you?

Ans. Yes, sir; he wanted to sell the machine to me; seventy-five dollars is what he asked for the machine.

Q. 5. Do you remember any man being present while he was dressing the mill-stones, who wore an artificial arm or iron hook?

Ans. No, sir; there was no such a man present.

Q. 6. Do you remember of any stranger being present, except the man who had the machine?

Ans. No, sir; not to the best of my recollection; there was no stranger present.

Q. 7. Do you remember whether customers or neighbors were coming in and out of the mill while he was dressing the stones?

Ans. Not that I know of, on that floor where the dressing was done.

[*Without waiving the objections above stated, respondents' counsel cross-examines de bene esse.*]

Cross-Q. 8. Since the adjournment here last evening, you have been talking to somebody about this case, have you not?

Ans. There was some talking. I remember; there was some talking done about this telephone case, and so on.

Cross-Q. 9. With whom did you talk about it since your deposition was closed yesterday?

Ans. Kunkel and Gochenauer talked about it.

Cross-Q. 10. Didn't you talk about it with Mr. Storrow or Mr. Smith or somebody else, besides Mr. Kunkel and Mr. Gochenauer?

Ans. No, sir; I did not.

Cross-Q. 11. What did you and Mr. Kunkel and Mr. Gochenauer talk about—what particular points?

Ans. About the cost of it—what great expense, etc.—that is about all.

Cross-Q. 12. Have you talked with anybody about a one-armed man?

Ans. Yes; we had conversation some, since we are down here, about this one-armed man.

Cross-Q. 13. Whom did you talk to about the one-armed man?

Ans. The party that came with me; Kunkel and Gochenauer.

Cross-Q. 14. Haven't you talked to anybody else, since you came here, about the one-armed man?

Ans. No, sir: I didn't; I am not intimately acquainted with no other persons.

Cross-Q. 15. Hasn't Mr. Storrow or Mr. Smith asked you any questions about the one-armed man since you closed you deposition last evening?

Ans. I don't really recollect whether there was any; I might have been asked whether I knowed the man or not—was acquainted with him.

Cross-Q. 16. Since yesterday's adjournment, who has asked you whether you remembered a one-armed man being there at the time of the use of that diamond dressing machine?

Ans. I forget his name; a man that stays at this house. Morrett I think is his name; I am not sure, though.

Cross-Q. 17. Was the name Tompkins?

Ans. Tompkins, I think, is the name; I had forgotten the name.

Cross-Q. 18. He is here assisting the counsel for complainants, Mr. Storrow and Mr. Smith, in some way; is he not?

Ans. That I cannot really tell; I didn't inquire into their business.

Cross-Q. 19. In what room did you have the talk with him?

Ans. I think it was 526.

Cross Q. 20. Who is occupying the room?

Ans. That I cannot tell; I didn't inquire.

Cross-Q. 21. How came you to be in the room?

Ans. My friends was in there, and I was in different rooms through the house.

Cross-Q. 22. Who was present in the room while you were talking with Mr. Tompkins?

Ans. I think a man by the name of Croll; and Kunkel just came in.

Cross-Q. 23. Is that all that were in the room?

Ans. Yes, sir; at that time.

Cross-Q. 24. Did you talk with Tompkins in any other room in the house?

Ans. No, sir; I didn't.

Cross-Q. 25. Who invited you to go into that room No. 526?

Ans. Mr. Gochenauer.

Cross-Q. 26. Did he tell you what he wanted you to go in there for?

Ans. No; he just simply invited me in there directly when I came there.

Cross-Q. 28. You say you talked with Mr. Tompkins there in that room. Now when you went into that room, at the time when you had the talk with Mr. Tompkins, did you find Mr. Tompkins in the room or did he come in afterwards while you were in there?

Ans. Mr. Tompkins wasn't in the room when I entered the room, the first time when I came here.

Cross-Q. 27. Since you came here you have entered the room a number of times, have you?

Ans. I have been in, yes; off and on.

Cross-Q. 29. Now I shall refer to one particular time when you say you were in the room, namely, the time when you had the talk with Tompkins there. How happened you to go into the room then; did some one ask you to go in? if so, who?

Ans. No person asked me to go in; I went in of my own accord; I came in from the street, and went right in to see Mr. Kunkel, expecting that he might be in there.

Cross-Q. 30. Mr. Jacob S. Kunkel?

Ans. Yes, sir.

Cross-Q. 31. Whom did you find in the room when you went in there?

Ans. Mr. Croll.

Cross-Q. 32. Give Mr. Croll's name in full, and where does he live?

Ans. That I cannot do; I am not acquainted with the gentlemen; I don't know that I ever seen him to know his name before this day in the room.

Cross-Q. 33. You say that you entered the room and found Mr. Croll there; did you find anybody else there; if so, who was it?

Ans. There was no person in when I came in the room but Mr. Croll.

Cross-Q. 34. Mention all the persons who came afterwards while you were in the room.

Ans. As far as I remember it was J. Kunkel and Tompkins.

Cross-Q. 35. Did they come in together?

Ans. No, sir.

Cross-Q. 36. Are you rooming in this hotel?

Ans. Yes, sir.

Cross-Q. 37. What room?

Ans. 604.

Cross-Q. 38. Are Mr. Jacob S. Kunkel and Mr. Gochenauer rooming in this hotel?

Ans. Yes, sir.

Cross-Q. 39. Is Mr. Tompkins rooming here in this hotel?

Ans. I did not inquire.

Cross-Q. 40. You testified yesterday that you could not remember all the persons who were present at the time those two stones were dressed with the diamond dressing machine; did you not?

Ans. I think I did.

Cross-Q. 41. That event was from eight to ten years ago, was it not?

Ans. It was between the spring of 1871 and the spring of 1874.

Cross-Q. 42. You also testified that you do not know Mr. Urias R. Nichols, of Newbury township, York county, did you not?

Ans. Yes, sir; I don't know him.

Cross-Q. 43. While the stranger was dressing those stones, how long did it take him to complete the operation with his diamond dressing machine?

Ans. That I couldn't tell exactly, but it may be between three and four hours.

Cross-Q. 44. You were giving your attention chiefly to the operation of the machine, I suppose; were you not, to see how it worked?

Ans. Yes, of course, when I hadn't any business of my own I was about him when he was dressing.

Cross-Q. 45. Did you have any other business of your own at that time, that took you into other parts of the mill, or out of doors?

Ans. No, sir; my business was in the mill all the time, especially that time he was there.

Cross-Q. 46. While he was there, was the mill shut down, or were the other three run of stones running?

Ans. The mill was running.

Cross-Q. 47. Who was attending to the running of it?

Ans. I myself was one, and then I had a hand.

Cross-Q. 48. Who was the hand?

Ans. That I couldn't tell exactly. I had several hands that summer, and I couldn't tell which one was there at the time the dressing-man was there. If I had my book here, I suppose I could tell which one was there; and then he might have been away, too. I couldn't tell whether the miller I had was there at the time, or not.

Cross-Q. 49. I suppose you don't mean to testify positively that no one-armed man was in the mill at any time during the whole three or four hours while the stranger was using the Diamond dressing-machine; but only that, after the lapse of from eight and a half to eleven and a half years, you cannot remember of seeing any present; is not that the fact?

Ans. As a general thing, if a one-armed man—whether there was a stranger there, or not—would come to a place, there would be some talk—a man that had one arm, especially if he had his arm fixed as this man had. He would be an especial object to remember. There would be some talk on the subject, too, how this man lost his arm.

Cross-Q. 50. And that is what makes you think that you didn't see a one-armed man there at that time, is it?

Ans. Yes, sir; I am positively sure that there wasn't such a man there.

Cross-Q. 51. By "such a man" you mean a man "having his arm fixed" the way this man had; do you?

Ans. Yes; and I wasn't out of the mill long enough for a man—if he had been there, of course I would have seen the man, because I was in the mill, except when I went to dinner. I can't recollect that I was out of the mill.

[*This answer and the 29th answer objected to by Mr. Hill, as hypothetical, argumentative, and not responsive.*]

Cross-Q. 52. Referring now to the mere matter of your memory, please answer this question, without argument: Can you swear to anything more, as a matter of memory, than that you don't remember seeing a one armed man there at that time?

Ans. I wouldn't know, but as concerns my business and any other business, there is hardly ever a man goes in unless he has an object in view; and he doesn't go in and not say anything about it. On that ground I believe I could be qualified to it—unless it was an insane man.

[*Answer objected to by Mr. Hill, as argumentative and not responsive.*]

Cross-Q. 53. Then that is the ground on which you have qualified about a one-arm man being present or not present, is it?

Ans. Yes, sir; and not seeing him there.

Cross-Q. 54. You don't recollect seeing him there, that is as far as your memory goes; is it?

Ans. No, sir; I didn't see him there.

Cross-Q. 55. You have referred to a man having his arm fixed as this man had. Did you ever see Mr. Urias R. Nichols?

Ans. No; I didn't see him, but I heard his arm described, how it was fixed, that he could work with it. I haven't seen the man, never, not since he has had his arm lost. I might have seen him, and not known him. I might have seen you, too.

Cross-Q. 56. When did you hear his arm described, and who described it to you?

Ans. Since I am here. Mr. Kunkel.

Cross-Q. 57. You were not present in this room while Mr. Kunkel was giving his deposition yesterday or to-day, were you?

Ans. No, sir.

Cross-Q. 58. How did Mr. Kunkel describe Mr. Nichols' arm?

Ans. It was an iron fixed arm with a hook at its end—a kind of a hook to work with—to grab. That is the way I understood him.

Cross-Q. 59. Now, do you mean to swear that such a man could not possibly be in your presence, or be in the same room with you for five minutes, eight or eleven years ago, without your observing the hook and remembering it to this day?

Ans. Did you mean, forgetting that I seen the man? Yes, sir. Of course he couldn't be in my presence without my observing a thing like that, and it still being in my memory.

Cross-Q. 60. What would attract your attention so quickly and earnestly—the mere fact of his having lost a part of his arm, or the peculiar appearance of the iron hook?

Ans. Both; the hook and minus the arm.

Cross-Q. 61. If he had been there without the hook and simply minus the arm, could you swear positively that you would have noticed, that the lower end of one sleeve was empty, and have remembered the circumstance to this day, so long after?

Ans. If he would not have had an artificial arm, I think I could: that is, a wooden arm the shape of the arm and hand.

Cross-Q. 62. But if he had an artificial arm resembling the natural arm and hand, then you might not have noticed it; is that the fact?

Ans. Yes, sir.

Cross-Q. 63. Then he might have been present a portion of the time with such an arm or hand, for aught you know to the contrary; might he?

Ans. There was no stranger present there to the best of my knowledge, but the man dressing the stones.

Cross-Q. 64. But you have sworn that you don't remember all the people who were there, and don't even remember whether your own assistant was there; nor what the assistant's name was, if he was there; in view of such a failure of memory as that, are you able now, after more than eight years, to testify to anything more than that you don't recollect of any stranger being present?

Ans. There was no—of course there was people there, through the day, customers going back and forth, that I wouldn't remember; a man would have to have a whole book full of memorandums to remember all that; but as concerns a man with one arm being there, I can be qualified that I didn't see nor hear of such a man being there; that is about all I have to say.

Cross-Q. 65. Can you mention the name of any customer who was there at the mill that day, while the man was dressing the stones with the diamond dressing machine?

Ans. No, sir.

Cross-Q. 66. Can you testify how many customers were there that day during that time, or any part of it, while that man was dressing the mill-stones?

Ans. No, sir.

Cross-Q. 67. Can you testify that you personally knew every customer who came there during that three or four hours?

Ans. No, sir.

Cross-Q. 68. Can you testify that all the customers who came, during that three or four hours, came alone, and that no one had a friend with him?

Ans. No, sir; I didn't watch that close outside.

Cross-Q. 69. Can you testify whether all the customers who came during that three or four hours were men, or whether some of them were women or children?

Ans. No, sir.

Cross-Q. 70. Was Mr. Kunkel's mill at Lisburn situated right in the village?

Ans. Yes, sir.

Cross-Q. 71. How far from the post-office?

Ans. May be about thirty or forty yards, or fifty; I couldn't tell accurately.

Cross-Q. 72. Who was the postmaster while you were there?

Ans. I think, Mr. John C. Bowman; I am not positive.

Cross Q. 73. Were there any stores in the village; if so, how many?

Ans. Yes, sir; there were two stores in it.

Cross-Q. 74. Who kept those stores?

Ans. Bowman kept the one at the post-office, and Starr kept one in the village.

Cross-Q. 75. How far was Starr's store from the mill that you had charge of?

Ans. I couldn't tell exactly; about five hundred yards, more or less.

Cross-Q. 76. Was there a tavern in the place?

Ans. Yes, sir.

Cross-Q. 77. Was the mill that you had charge of alongside of the public road?

Ans. Yes, sir.

Cross-Q. 78. Was it on the road that a person would take in going from Harrisburg to Newbury, by way of Lisburn?

Ans. Which do you mean, the mill? By branching off you could go by that road to Newbury, but the direct road don't go to Newbury.

[*Answer objected to by Mr. Hill, as evasive and not responsive.*]

Cross-Q. 79. Is there a road leading from Lisburn to Newbury?

Ans. I think so.

Cross-Q. 80. Does not that road pass over the bridge and directly by the mill?

Ans. Which road?

Cross-Q. 81. The road from Newbury to Lisburn.

Ans. I don't know the name of the road. It must be a branch road.

Cross-Q. 82. Do you know where Newbury is?

Ans. I have been there several times.

Cross-Q. 83. Did you ever go from Lisburn there, or from there to Lisburn?

Ans. No, sir.

Cross-Q. 84. Then you don't know anything about the roads between Lisburn and Newbury, do you?

Ans. Yes, sir; I went the road from Lisburn to Lewisbury.

Cross-Q. 85. Did you go over that bridge near the mill, when you went that road?

Ans. Do you mean the bridge at Lisburn?

Cross-Q. 86. Would the bridge near the mill be anywhere else than at Lisburn?

Ans. There is a bridge at my mill—right where I live. The place wasn't specified where the bridge was to be.

Cross-Q. 87. Do you mean at Warrington township, where you live?

Ans. Yes, sir; that is the place.

Cross-Q. 88. How far is the place where you live, in Warrington township, from the mill at Lisburn?

Ans. I guess it is about eight miles.

Cross-Q. 89. How far is Lewisbury from the mill at Lisburn?

Ans. I think, about three miles.

Cross-Q. 90. Is Lewisbury on the road from Lisburn to Newbury?

Ans. That I can't tell. I don't know whether it is called the Lewisbury road, or not; but the road from Lewisbury to Lisburn is called the Lisburn road. That is about as far as I went on those roads—to Newbury. That is the way the mail went on those roads—from Lisburn to Lewisbury, and from there to Newbury, but on what road I cannot tell.

Cross-Q. 91. Do you mean that the mail went over the bridge at your mill in Lisburn, in going from Lisburn to Lewisbury?

Ans. Yes, sir.

Cross-Q. 92. And then the mail was carried on from Lewisbury to Newbury, but you don't know by what road; is that what you mean?

Ans. Yes. I never seen the mail starting from Lewisbury to Newbury, and don't know which direction it took. It might have taken five or six roads, if it went around. It went from Newbury to Goldsboro'. There is a post-office at Newbury.

Cross-Q. 94. As you understood it, the mail went from Lisburn to Lewisbury, and from Lewisbury to Newbury; did it?

Ans. So I was told. Yes, sir.

Cross-Q. 95. And in going from Lisburn to Lewisbury, it passed over the bridge near Jacob S. Kunkel's mill, did it not?

Ans. I think so; it went that direction, towards the bridge.

Cross-Q. 96. How far is the bridge from Jacob S. Kunkel's mill?

Ans. I cannot tell exactly; maybe two hundred yards or three.

Cross-Q. 97. So that is your best recollection about it?

Ans. What shall the recollection be; about the road, or the bridge, or the mill, or the mail?

Recess for lunch until 2 30, P. M.

DECEMBER 8, 1882, 2.30, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Cross-examination of Elijah S. Kunkel, by Mr. Hill, continued:

Cross-Q. 98. Is that your best recollection of the distance from the bridge to the grist mill?

Ans. Yes, sir.

Cross-Q. 99. Can you swear it is as much as one hundred yards, from the bridge to the grist mill?

Ans. I couldn't tell exactly how far it is; I wouldn't be qualified to the fact.

Cross-Q. 100. Did you ever see any one-armed man in the mill at Lisburn during the three years that you lived there?

Ans. Yes, sir.

Cross-Q. 101. How many?

Ans. Two.

Cross-Q. 102. Name them.

Ans. Michael Smyser and Rudy; his first name I don't remember.

Cross-Q. 103. Where does Rudy live, and what is his business?

Ans. He lived in Lisburn the time I lived there; he peddled bones, and old iron, etc, so far as I know.

Examination taken, reduced to writing, and by the witness subscribed to before me, the 8th day of December, 1882.
FRED. M. OTT,
Examiner.

ELIJAH S. KUNKEL.

MARTIN S. CRULL, *being produced, affirmed, and examined, saith:*

Examined by Mr. Storrow:

My age is forty-one. Residence, Newburytown, York county, Pennsylvania. Occupation, farmer.

Q. 1. Do you live at the present time in the village?

Ans. No, sir; about a mile east.

Q. 2. When did you begin to reside on your present farm, and where did you reside last before that?

Ans. I moved there in 1875. I resided in the village of Newbury immediately before that.

Q. 3. How long have you lived in that part of the country?

Ans. I have lived within three miles of that place all my life time; I was born within three miles of that place.

Q. 4. Did you ever own a mill in that neighborhood, and if so, when did you buy it?

Ans. I did. I bought it in 1871.

Q. 5. When did you sell it?

Ans. In the spring of 1882.

Q. 6. Was it ever burnt down; if so, when?

Ans. It was, on the 7th of April, 1881, on the night of the 7th.

Q. 7. How near was that mill to where you now live?

Ans. One mile and a half.

Q. 8. Is there any other Mr. Crull near there, who owned a mill between 1871 and 1880?

Ans. No, sir; there is not.

Q. 9. Do you know Mr. Urias R. Nichols, a one-armed man, about forty years old, who resided near Newbury a couple of years ago?

Ans. Yes, sir; I do.

Q. 10. When did you first know him—how many years ago?

Ans. I suppose thirty years. We were boys together at school. I can fix no date.

Q. 11. Do you know the house he lived in a couple of years ago; and, if so, how far is it from your present farm?

Ans. I do. It is about one mile.

Q. 12. About how far was it from the place where you lived in Newbury village, before you moved on to your present farm?

Ans. About the same distance, I think.

Q. 13. Was he customer at your mill?

Ans. He was.

Q. 14. Did Mr. Nichols ever meet you in Col. Maish's office in York, and tell you that he had seen a talking-machine at the shop of Daniel Drawbaugh, at Eberly's Mills?

Ans. No, sir; he did not.

Q. 15. Were you ever with him at Col. Maish's office in York?

Ans. No, sir; I never was in Col. Maish's office in my life before yesterday.

Q. 16. Did Mr. Nichols ever speak to you about Drawbaugh, or about any telephone or talking-machine in connection with Drawbaugh, or about any suit concerning a talking-machine?

[*Objected to by Mr. Hill as not rebuttal, and because it is incompetent to prove any conversation with Nichols, except that referred to in Nichols' testimony, and which Nichols only says he thinks took place.*

Complainants' counsel objects that that is not a correct statement of Nichols' testimony.

Respondents' counsel refers to Nichols' 42d answer.

Complainants' counsel refers to his 44th answer also, page 97 of respondents' printed record.

Respondents' counsel says that the statements of Nichols about that conversation are all to be taken in connection with his 42d answer, which modifies the entire statement.

Complainants' counsel says that they are all to be taken, and not the 42d answer only]

Ans. He did.

Q. 17. What did he say about it, and when was it?

[*Objected to by Mr. Hill, as incompetent and not in rebuttal; Mr. Nichols not being a party to this cause, his ex parte and hearsay statements cannot be received in evidence.*]

Ans. He told me he was a witness and had to appear in Harrisburg in connection with this suit; that was sometime in April, 1881, very shortly before he had to appear there.

Q. 18. Was it or was it not, any time near the time when your mill was burned?

[*Same objection.*]

Ans. I can't say that it was before the time or after; it was some time about the beginning of the month, somewhere, I can't tell when.

Q. 19. Had he, or had he not ever spoken to you before that about Mr. Drawbaugh in connection with a talking machine?

[*Same objection.*]

Ans. He had not, to my recollection.

Q. 20. When he told you that he was going to be a witness in that case, did it surprise you, or did it strike you as something natural?

Ans. It surprised me very much to know how he could know anything about so important a case.

Q. 21. Did Mr. Nichols ever tell you about any burr-dressing machine made, or said to have been made, by Mr. Drawbaugh?

Ans. He did not; not that I have any recollection of.

Q. 22. When did you first see Mr. Daniel Drawbaugh, and where, and under what circumstances?

Ans. I went to Eberly's Mills sometime in 1866 or 1867—I ain't positive what time—for a load of flour; my uncle, Lafayette Crull, took me to Drawbaugh's shop to see a self-feeding nail-cutter that he had invented.

Q. 23. How near to the grist-mill was Drawbaugh's shop when you went into it?

Ans. I can't say positively about the distance, but I think it was very close to the mill.

Q. 24. Between the time when you bought your mill in 1871, and the time when it was burned down in 1881, did you put in any new bolt-cloths, and if so, when did you put in the first one?

Ans. The first one I put in in 1872, when I rebuilded the mill.

Q. 25. By rebuilding the mill, do you mean rebuilding the building, or rebuilding the machinery?

Ans. I mean rebuilding the machinery. I put in new machinery entire.

Q. 26. If you have any paper or data by which to refresh your recollection as to the time when this rebuilding took place, will you please produce it and state what it is, and how it helps you to give the date?

Ans. I have a catalogue from the York Manufacturing Company, containing a testimonial to the Bollinger Turbine Company, giving the date.

(The book produced by witness is entitled "Illustrated and Descriptive Pamphlet and price list of the Bollinger Turbine Water-wheel, manufactured by York Manufacturing Company, York, Penna. York, Pa. Small & Welch, printers, 1875." On page 57 is the following:

"NEWBURYTOWN, PA., Sept. 26, 1872.

"O. J. Bollinger, Esq.,

"Dear Sir: Since my last to you, we have had plenty of water and gave your wheel a fair trial; I am now satisfied that they are far superior to an overshot. Yours respectfully,

M. S. CRULL.")

Q. 27. When did you next put in any new bolting cloths?

Ans. In 1880; I replaced the one put in in 1872, by a new cloth.

Q. 28. When was the cloth put in in 1880 bought?

Ans. Perhaps a year before it was put in.

Q. 29. Since you have been living on your present farm, have you been in the habit of sending your produce to market to York?

Ans. We do; all goes to York.

Q. 30. Who has been in the habit of going with it—which of your family at various times?

Ans. My wife generally done the marketing.

Q. 31. Was there any time when you were in the habit of going yourself, and if so, when?

Ans. During the peach season of 1879 I marketed the fruit myself.

Q. 32. The defendants' record, page 338, contains the deposition of Isaac B. Millard; he said that he was thirty-six years old; resided in Newbury township; was a farmer; moved on to his present farm in 1874; that he had worked as a house-carpenter and mill-wright, and had been president of the school-board in his township; that the farm was bought by his father-in-law from the estate of Michael Strominger, deceased; do you know that Isaac B. Millard?

Ans. I do.

Q. 33. How near does he live to Urias R. Nichols?

Ans. I suppose it is about three miles north-east.

Q. 34. Do you happen to know whether he and Mr. Nichols are acquainted?

[*Objected to by Mr. Hill as immaterial and irrelevant.*]

Ans. I think they are.

Cross-examined by Mr. Hill:

Cross-Q. 35. Why did you go to Col. Maish's office yesterday?

Ans. I went there to inquire for Mr. Storrow.

Cross-Q. 36. Had you been directed or requested to go there?

Ans. Mr. Storrow requested me to call there.

Cross-Q. 37. Did he say what he wanted you to call there for?

Ans. He brought me to York, and I was looking up some little dates, and he requested me to call there preparatory to taking the train for Philadelphia.

Cross-Q. 38. What little dates were you looking up?

Ans. I went to Mr. Bollinger to get an old catalogue to fix the date of the repairing of my mill.

Cross-Q. 39. What did you want to fix the date of repairing your mill for?

Ans. Mr. Storrow requested me to get something to refresh my memory.

Cross-Q. 40. How long have you known Col. Maish?

Ans. I only know Col. Maish by reputation; I have known him, when I would see him, ever since he was in the army; there is where I first saw him. I never had no personal acquaintance with the man.

Cross-Q. 41. You mean ever since the war of the rebellion, do you?

Ans. Yes, sir.

Cross-Q. 42. Do you remember of ever being in York, in company with Mr. Urias R. Nichols?

Ans. We met frequently during market hours; at no other time.

Cross-Q. 43. You don't remember all the conversation you had with him during those frequent meetings in York, do you?

Ans. I would hardly remember all of an ordinary conversation.

Cross-Q. 44. You don't remember all the subjects that were discussed during all those conversations in York, do you?

Ans. No, sir; I don't suppose there was anything very important, or it is likely I would have remembered some part of it, at least.

[*All of the last answer after "No, sir," objected to by Mr. Hill, as irresponsive, and as argumentative and mere guess-work.*]

Cross-Q. 45. How far do you live from York market?

Ans. We call it thirteen miles.

Cross-Q. 46. How far do you live from Harrisburg?

Ans. I think it is about the same distance.

Cross-Q. 47. How many bolts did you put in your mill when you rebuilt it, in 1871 or 1872?

Ans. I put in but one.

Cross-Q. 48. Have you never had but one bolt in the mill at a time?

Ans. My father put a custom bolt in, about a year before I purchased the mill from him; this one that I put in was a merchant bolt.

Cross-Q. 49. Then, after you rebuilt the mill, was there one custom bolt and one merchant bolt in it?

Ans. There was.

Cross-Q. 50. When you rebuilt the mill, did you reclothe the custom bolts, or continue to use the same old cloth on it?

Ans. We used the same old cloth, but I think we built a new chest partly out of the old chest.

Cross-Q. 51. How long did you use that same old cloth on the custom bolt?

Ans. The same cloth was on the reel when the mill was destroyed; we only used it for making buckwheat and rye, the last few years.

Cross-Q. 52. Did you ever have to patch the cloth on either of those bolts, or repair it?

Ans. Yes; on both of them.

Cross-Q. 53. How often, and when first, so far as you remember?

Ans. That I could have no memory of, as my miller put the patches on the cloth; I saw the patches, and he reminded me of it—said we ought to have a new cloth; I put it off as long as I could.

Cross-Q. 54. Name all the millers whom you had there from the time when you rebuilt the mill, in 1872, to the time when it was burned; and give their present places of residence, so far as you know them.

Ans. David Boyer was my miller when the mill was burned, and the only one I ever had; he run the mill all the time I owned it; he resides in Newbury township; his post-office address is Newburytown.

Cross-Q. 55. Where did you buy the bolting-cloth which you put on to the merchant reel, in 1872?

Ans. Of P. A. & S. Smalls, in York, Pennsylvania.

Cross-Q. 56. Where did you buy the bolting cloth which you put on in 1880?

Ans. I bought it of the same firm.

Cross-Q. 57. It is possible that Mr. Nichols might have said something to you, at some time eight or ten years ago, about Drawbaugh's talking-machine, or burr dressing-machine, and you have entirely forgotten the circumstance; is it not?

Ans. I think not; I think I would have hardly forgotten so important a circumstance.

Cross-Q. 58. There have been a good many burr dressing-machines brought before the milling public during the last ten or eleven years; have there not?

Ans. Yes, sir; I admit the fact; as my miller done the dressing of the stones it was immaterial to me what he used; I paid no attention to such matters at all.

Cross-Q. 59. If you had heard of a talking-machine as long ago as 1875, before anything was known of the telephone, do you think you would have been any more interested about it, at that time, than you would about a burr dressing-machine which was directly connected with your business as a miller?

Ans. I think I would have, from the fact that burr dressing-machines were numerous, and a telephone would have been rather a new thing to me—or a talking-machine, rather.

Cross-Q. 60. Do you know anything about the subject of electricity and its application in the arts?

Ans. I do not; I never studied anything connected with electricity.

Cross-Q. 61. You never have taken any particular interest in the subject of electricity and its applications in the arts, have you?

Ans. Never did.

Cross-Q. 62. You wouldn't have understood anything about it, if anybody had described an electrical machine to you; would you?

Ans. I would likely have understood the purpose for which it was intended; that is about all, I suppose.

Redirect by Mr. Smith:

Q. *Q.* 63. How long were you at Col. Maish's office yesterday?

Ans. Long enough to pass across his office and make the inquiry and return. I suppose it occupied perhaps a minute or perhaps more.

Q. *Q.* 64. Do you mean, make the inquiry for Mr. Storrow?

Ans. Yes, sir.

Q. *Q.* 65. Did you find him at that office?

Ans. I did not.

Q. *Q.* 66. Were you told where to go to find him?

Ans. Col. Maish directed me to Mr. Stambaugh's hotel.

Q. Q. 67. Was that all the conversation that took place at Mr. Maish's office?

Ans. Yes, sir.

Q. Q. 68. Had you ever been spoken to about testifying in this case, before Mr. Storrow called on you yesterday?

Ans. I was not.

Q. Q. 69. You said Mr. Storrow brought you to York; did he bring you there from your own place?

Ans. He did.

Q. Q. 70. Did you have any conversation yesterday with anyone, except Mr. Storrow, about this case?

Ans. I did not, except my wife, when she asked me what was the matter.

Examination taken, reduced to writing, and by the witness affirmed and subscribed to before me, this 8th day of December, 1882.

FRED. M. OTT,
Examiner.

M. S. CRULL.

Adjourned until December 9, 1882, at 10, A. M.

DECEMBER 9, 1882, 10, A. M.

Examination resumed pursuant to adjourment.

Present, same counsel.

DAVID A. HAUCK, *being produced, sworn, and examined, saith:*

Examined by Mr. Smith:

My age is thirty-six; residence, Mechanicsburg, Pa.; occupation, machinist.

Q. 1. How long have you resided in Mechanicsburg?

Ans. During the whole of my life, excepting a few months.

Q. 2. How long have you known Daniel Drawbaugh, of Eberly's Mills, if you have known him?

Ans. I have known him intimately for nine years.

Q. 3. If you had known him before that time, state what you knew of him and where you met him.

Ans. For five or six years previous to the year 1873, he came to my father's shop at Mechanicsburg, perhaps as often as twice a year, where I saw him, and knew him to be Daniel Drawbaugh; although I did not exchange words with him except on one occasion, when he came there with an automatic boiler-feeder, perhaps during the years 1869 or 1870, when we did have some conversation over the merits of this machine.

Q. 4. Did you understand that that was a machine of his invention or construction?

[*Objected to by Mr. Hill as immaterial, irrelevant, and not in rebuttal.*]

Ans. He said it was.

Q. 5. Do you know for what purpose he brought it to your father's shop, and what was done with it there?

[*Same objection.*]

Ans. I do not know for what purpose he brought it there, and he took it away with him the same day; it was a working machine, but a very small one; I would say it was not a full-sized working machine.

Q. 6. Do you recollect anything about the construction of the device, and how it was intended to operate? If so, please describe it as far as you are able.

[*Same objection.*]

Ans. It consisted of a casing, similar to an ordinary stop or plug-cock, in which there was a plug or cylinder, having pockets or cavities, which cylinder was revolved by hand when he showed it to me. It was intended to have a water supply, or head of water, which would fill the cavities or pockets when they were on the upper side of the casing, and be discharged into the boiler when the pockets came to the under side of the casing, during the revolution of the cylinder.

Q. 7. Did you afterwards go to Mr. Drawbaugh's shop, at Eberly's Mills; if so, will you state when you first went there, and what was the occasion of your going there?

Ans. I went there for the first time during the latter part of June, 1873, for the purpose of examining the works of the Drawbaugh Manufacturing Company, with a view of purchasing.

Q. 8. Did any one go with you on that occasion?

Ans. Either George W. Hauck, Samuel F. Hauck, or both of them, were with me; I cannot remember exactly.

Q. 9. Did they propose to be parties to the purchase, if one was made?

Ans. They did.

Q. 10. Whom did you meet there, and what examination did you make of the premises and machinery?

Ans. There were several persons there at the time, but I knew none, except Daniel Drawbaugh. We examined the tools and machinery very carefully, Mr. Drawbaugh explaining to us the various uses, and telling us what belonged to the Drawbaugh Manufacturing Company, to himself, and others.

Q. 11. Do you remember what parts of the building you went into? If so, state generally what you found in the several rooms.

Ans. My impression is that we went into all parts of the building at that visit; in the basement was a lot of rubbish or scrap-iron, which we looked over casually; on the first floor was nearly all of the machinery; on the second floor one room was occupied by Mr. Drawbaugh, partly as a private room, one room as a work-shop by him, and the other room had a few tools or machines, and was used for painting and packing; the third floor or loft was filled with patterns and a few finished pumps.

Q. 12. Did Mr. Drawbaugh take you into his private room at that time; and if so, what did you see there?

Ans. He did; and passed through his private room to get to the third floor or loft; there was a large table or desk, a number of books and papers scattered over it, some drawing materials; and there was an old-fashioned high clock standing in a corner of the room, which he told us he was then using, or meant to use to drive another clock in the next room or work-shop by means of an electric current generated by a chemical battery. There were on the walls some comic drawings or portraits, also some specimens of wood carving; that is about all I can recall.

Q. 13. If Mr. Drawbaugh showed you any machines in other parts of the building, which he spoke of as his own invention, will you state what they were?

Ans. He showed us a great many things, although he did not say they were his inventions; still, we were impressed to believe they were, or to think they were; there was a steam syphon or pump, the automatic boiler-feeder before spoken of, a second pump which I understood was to supply boilers with water, a machine for insulating wire for telegraph purposes, a pressure blower, two stamp cancellers, a hydraulic ram, a nail plate feeding-machine or appliance; that is about all I can recall; there may have been others, but I don't remember of them now.

Q. 14. Did you make other visits to the shop before purchasing the property; if so, how many, and what persons were with you; and whom did you meet while there?

Ans. I made two visits; one was about a week after my first visit; I was in company with my father, George Hauck; another was a few days subsequent, in company with G. W. Hauck, S. F. Hauck, and J. A. Eberly, when we met the members of the Drawbaugh Manufacturing Company, and tried to effect a purchase, but did not succeed at that time. During these two last visits I again looked over the place, with a view of becoming better informed as to what was there.

Q. 15. Was Mr. Drawbaugh present at these last two interviews?

Ans. He was.

Q. 16. Did you subsequently make the purchase of the property? If so, state when it was, and when you took possession of the property.

Ans. We did purchase it subsequently, and took possession on or near the fifteenth of July, 1873.

Q. 17. If there was a written contract between the parties for the purchase of the property, will you refer to it to ascertain the date; and if there is a memorandum of the time when the property was delivered to you, will you give a copy of that memorandum?

Ans. I have an indenture made on the first of July, 1873, between William R. Gorgas and others, and George W. Hauck and others, conveying the property of the Drawbaugh Manufacturing Company, but the transfer was not really made and possession taken, until the fifteenth; there is a memorandum on the back of the paper as follows:

"Countersigned by the President, Secretary, and Treasurer of the Company; sealed with the corporate seal of the same, and deed delivered without recourse and possession given this fifteenth day of July, 1873.

Wm. R. Gorgas, President,
M. B. Mosser, Secy and Treasurer,
Drawbaugh Mfg Co."

Q. 18. Who were the parties who signed this contract with William R. Gorgas, on the first of July, on behalf of the vendors, and who signed it as purchasers?

Ans. William R. Gorgas, M. B. Mosser, S. M. Hertzler, William L. Gorgas, John Sheely, Daniel Drawbaugh, Henry S. Rupp, A. H. Gardner, Joseph C. Hursh, George Wise, J. F. Hursh; they are the vendors. The purchasers do not appear as signers, but are mentioned in the body of the deed as follows: George W. Hauck, D. A. Hauck, S. F. Hauck, and John A. Eberly.

Q. 19. Will you state whether you then took possession of the property; and if so, what business you carried on at that shop?

Ans. We took immediate possession; our principal business was the manufacture of measuring faucets, although we did some little mill repairing, etc.

Q. 20. Which one of the purchasers had the immediate personal superintendence of the work of manufacturing faucets at that mill?

Ans. Myself; inasmuch as I was the only member of the firm who was capable of superintending the manufacture of them.

Q. 21. How long was the business actively carried on there, and when, if ever, was it finally removed with the machinery you had purchased?

Ans. The business was carried on there until some time in May, 1876, although not actively all the time.

Q. 22. Will you state, as nearly as you can, what part of the time it was actively carried on, and what work you personally did at the shop, and during what time you personally worked there?

Ans. We operated pretty regularly from the time when we took possession until about the 1st of August of the following year, 1874, and from that time until the time of our removal I was not there nearly so often as during our first year; while there, I usually worked upstairs turning wood handles for faucets, making strainers, and painting, although, when not kept busy at this, I did lathe work and fitting on the first floor.

Q. 23. Did you reside at Eberly's Mills while you were carrying on the business there; and if not, where did you reside?

Ans. I did not; I resided at Mechanicsburg.

Q. 24. Did you go down in the morning and return at night usually?

Ans. I did.

Q. 25. Did you take any meals at Eberly's Mills, and if so, with whom?

Ans. I took one or two dinners with Daniel Drawbaugh, and with J. B. Drawbaugh, and the balance of the time I took dinner there I took it with Mr. George Leonard.

Q. 26. Did you sometimes carry your dinner with you, or spend half days there, when you dined elsewhere?

Ans. For about two weeks before I made arrangements to dine with Mr. Leonard I took my meal with me. I frequently went there for a half day and took no meal there.

Q. 27. Have you any means of telling how many times you dined with Mr. Leonard, and during what period it was?

Ans. I have means of telling how many times I dined, but not exactly what period it occurred in. I have a copy of ledger account with George Leonard,

[*Copy objected to by Mr. Hill, as secondary.*]

which shows his bill at our shop, for repairing at his mill, to amount to twelve dollars and fifty cents. On November 22, 1875, he desired a settlement; his bill for meals amounted to twenty-five dollars and ninety-five cents, including one horse-feed, twenty cents; the balance in his favor being thirteen dollars and forty-five cents, for which I gave him a due bill, which I sometime afterwards paid. The price of a meal was to be twenty-five cents; taking the amount, twenty-five dollars and seventy-five cents, would pay for one hundred and three meals, at twenty-five cents each.

[*All testimony relating to the alleged copy, or based upon it, objected to by Mr. Hill, as secondary and incompetent, and because the original is not produced.*]

Q. 28. Have you that due bill with you; if so, will you give its date?

Ans. I have; it is dated November 22, 1875.

Q. 29. You say you have a copy of ledger account: do you mean that it is a copy of your ledger account with Mr. Leonard while you were carrying on business at Eberly's Mills?

Ans. Yes, sir; that is it.

Q. 30. After August, 1874, when, as I understand, your business was not carried on there as actively as before, was there any period of increased activity; and if so, when was it?

Ans. There was; it commenced during the month of May, 1876, when we removed all the machinery necessary for the manufacture of faucets to Mechanicsburg.

Q. 31. During the latter part of 1874, the year 1875, and the early part of 1876, how often did you go to the shop, and for what purpose?

Ans. I might have been there five or six times, several times I went for faucets, and once or twice in company with a gentleman to whom I sold some machinery; and then I was there two or three days removing the machinery.

Q. 32. Was any other business started and carried on in that shop before your removal by another company? If so, state what that business was and the name of the company, if you knowit.

Ans. There was; there was manufactured a patent wagon spindle by a company which, I think, was called the Harrisburg Axle Company or Spindle Company, I don't remember which.

Q. 33. You have spoken of working on the upper floor, I believe, of the shop. Was that the floor on which Mr. Drawbaugh's private room and work room were situated?

Ans. It is.

Q. 34. During the time that you carried on business there down to the time of your final removal, did Mr. Drawbaugh continue to work at the shop; if so, what rooms did he work in and upon what work was he engaged?

Ans. He worked there very regularly and principally in the room in the north-west corner of the building, on the second floor, where was his work-bench and lumber. When I first went there he was working on the clock I have before spoken of; sometime afterward he made an apparatus for telegraphing by means of a horse-shoe magnet, without a battery; that is the way I understood it; he then did some repair work for the farmers of the neighborhood, as well as pattern-making and general machine repairing.

Q. 35. Was that room the one which you have before spoken of as Mr. Drawbaugh's work-room?

Ans. Yes, sir; that is the room I mean, in which the work-bench was.

Q. 36. Was the room which you spoke of as his private room in the opposite or north-east corner, on the same floor?

Ans. It was.

Q. 37. Did he continue to occupy this room while you were there?

Ans. He did.

Q. 38. Did you have access to this room, and also to the work-room, and were you accustomed to go into either or both of the rooms?

Ans. I had access to the private room, and passed through it to get to the pattern loft, and was obliged to pass through his work-room to go to my work-room.

Q. 39. Will you look at the diagram on page 921 of respondent's printed record, and state whether that shows the rooms on that floor as they were while you carried on business at the shop; and if not, in what respect they differed?

Ans. It does not; the gangway as shown, running from the north end of the building to the large room at the south end, was not there, and a partition, running nearly east and west, was continued to the corner of the north-east room; the partition between the gangway, as shown here, and the north-west room, not being there.

Q. 40. Were the stairs leading up to this floor within the building when you went there, or outside of it, and was a change at any time made in that respect?

Ans. There was a stairway inside only, when I went there. The Axle Company made a stairway on the outside of the building, on the north end, and changed the arrangement of the rooms upstairs, as it is shown in the diagram.

Q. 41. If Mr. Drawbaugh had occasion to use any machinery for any work for himself, was he allowed to use your machinery, and did he do so to any extent?

Ans. He had permission to use any of our tools when not in use by ourselves, and availed himself of the privilege, having no lathes of his own at that time.

Q. 42. What did you pay for the machinery and other property which you bought from the Drawbaugh Manufacturing Company?

Ans. We paid them seven thousand dollars.

Q. 43. Did you employ Mr. Drawbaugh to do any work for you while you were there, or have any talk with him about working for you?

Ans. He did no work for us; but at one time, when we were behind orders, I tried to get him to work on faucets for us. He promised me he would on the following day; but, on my coming there, said he had some work to do that he had promised other parties; and he never did any work for us, other than a little assistance he rendered, at different times, without compensation.

Q. 44. Was there anything said about the price you were to pay him; if so, what was it?

Ans. When I approached him on the subject, I asked him what he would work for a day: he replied that he would not work by the day, but would by the piece. I then asked him what he would want a piece to finish the faucets ready for packing; he said he would make them for forty cents each; I then said, "Why, Dan, you can't make wages at that, but if you will make them at sixty cents I will give you that, and you won't make a fortune at that," or words to that effect; I told him he wouldn't make a fortune out of it, or a mint. I don't remember the exact words; he accepted my proposition, with the result before mentioned.

Q. 45. Did you name any price which you would be willing to pay by the day?

Ans. I am not positive, but think not.

Recess for lunch until 2.30, P. M.

December 9, 1882, 2.30, P. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Examination of David Hauck, by Mr. Smith, continued:

Q. 46. You mentioned that some time after you went to Eberly's Mills, Mr. Drawbaugh made an apparatus for telegraphing by means of a horseshoe magnet, without a battery: did you see him working on the instrument before it was finished?

Ans. I did.

Q. 47. Did you see it after it was completed?

Ans. I did.

Q. 48. Can you give any further description of it—the manner in which the magnet was arranged and operated?

Ans. My recollection is that there was a magnet in the shape of a horseshoe, made of three or four thicknesses of steel, mounted on pivots or trunnions, with a knob at the larger or curved end, by which to swing it or operate it. In front of this horse-shoe magnet was what, I believe, is called an electro-magnet, which, I think, was permanently fixed or fastened to a base, which, I think, was of walnut wood; that is about all the description I can give; I don't understand the theory of its operation.

Q. 49. Did you see Mr. Drawbaugh operate this instrument in the shop; and if so, how much and what did he do with it, and was it connected with any other apparatus?

Ans. I saw it in operation; at the time he was using it to ring a small bell or gong either in a corner of the same room or in the next room; I don't remember exactly which.

Q. 50. If you heard Mr. Drawbaugh say anything about trying it on a telegraph line, will you state what he said and what, if anything, was done in consequence of what he said?

[*Objected to by Mr. Hill, as irrelevant and immaterial.*]

Ans. Some time after he had it completed—he had been trying it in the shop for different purposes—he expressed a desire to try it on a long line of wire. Feeling interested, by his request for permission, I applied to George A. Zacharias, who was the agent of the Cumberland Valley railroad at Mechanicsburg, asking him to give Mr. Drawbaugh an opportunity of testing his instrument. He said he would, and some time after Mr. Drawbaugh and I went to the telegraph office, and Mr. Zacharias connected the instrument to his relay or sounder; I don't remember which, and endeavored to write with it, as he said; but said it was too cumbersome and unwieldy: he could not do much with it. I went away after about ten minutes, leaving Mr. Drawbaugh there.

Q. 51. Do you know whether Mr. Drawbaugh brought the instrument away with him when he came away, or whether he left it there?

Ans. I do not know.

Q. 52. Do you remember whether you ever saw the instrument afterwards at Mr. Drawbaugh's shop?

Ans. I don't remember of seeing that same one afterwards.

Q. 53. Did you ever see one of the same kind, or similar to it, at the shop?

Ans. I think I saw one at the shop afterwards differing from the first one in having the horse-shoe magnet permanent, and a sliding core in the electro-magnet. Mr. Drawbaugh told me this obviated the objection to its being cumbersome and unwieldy.

Q. 54. When you say that the horse-shoe magnet was permanent do you mean that it was stationary—did not rock?

Ans. I do.

Q. 55. Did you see anything of a fire-alarm apparatus while you carried on business there. If so, state what it was and when it was that you saw it.

Ans. I saw an automatic fire-alarm during one of my visits, which I think was in the fall of 1874—or spring of 1875, I can't remember which: it consisted of a bar of metal, which was very sensitive to a change of temperature; he made use of this feature, that is, the expansion or contraction of this metal, to make or break an electric current and sound an alarm by ringing a bell.

Q. 56. Did you have any conversation with him about this apparatus; if so, what was it?

Ans. I either said so to him at that time or during a visit shortly afterwards, that I had saw advertised and read a description of a very similar apparatus; when he replied that his was entirely different in construction, saying it was more reliable than the other, because it completed the circuit or current to sound the alarm, while the other broke it, or *vice versa*; I can't remember which.

Q. 57. Did you know anything about a rag-carpet instrument which he had; and if so, what did you know about it?

Ans. I knew of an apparatus for joining carpet-rags instead of sewing them; it was a blade something the shape of a shuttle, with a small wood screw soldered to the blunt end—I would call it—for the purpose of fastening it to a board or table, and having two pointed ends at one end of an opening—I suppose you would call it—for the purpose of holding the end of the rag to be joined.

Q. 58. Do you remember seeing any dial telegraph instrument, or any transmitting instrument resembling a key-board. If so, state what you know about them.

Ans. I remember of seeing, during one of my later visits to the place, a key-board with the letters of the alphabet engraved or painted on the keys, and also a dial, but I cannot say that the two were connected; Mr. Drawbaugh told me it was a printing telegraph.

Q. 59. Which did he tell you was a printing telegraph, the dial or the key-board?

Ans. I cannot remember whether they both belonged to one apparatus or were distinct and separate machines.

Q. 60. You spoke of seeing a clock at your first visit to Drawbaugh's shop, which was made to operate another clock; did you see him doing anything on any other clocks excepting these two, while you carried on business there? If so, state what you know about it, and how much interested Mr. Drawbaugh manifested in it

Ans. He either finished or had under construction a clock to be driven by earth plates—I think he termed them. I saw a finished clock there at one time, but whether it was before or after we moved away I am not positive. He seemed to be very much engrossed with his clocks.

Q. 61. How much was he in the habit of talking with you about his inventions or new things he was making?

Ans. He would talk with me a great deal; or very frequently, when a new idea would occur to him, he would call me to him and ask what I thought of it. Sometimes I would not understand it and he would use every effort to make it clear to me, sometimes without success. I might say there was hardly a day passed that he did not converse over things he was making or other mechanical matters.

Q. 62. Did he have at his shop any publications of the Patent Office, and if so, what were they?

Ans. He did. He had Patent Office reports in bound volumes, also copies of the *Gazette*.

Q. 63. You have spoken of having access to his private room: were you or were you not frequently in that room, and did you meet him there; and did you see or meet other people there?

Ans. I cannot say that I was there frequently. Perhaps I would go there and spend an hour once in a week. I cannot remember of having any other person there with me, except Mr. Drawbaugh and one or both of my partners, G. W. and S. F. Hauck.

Q. 64. To what extent was that shop resorted to by the people of the village socially or for business purposes?

Ans. I would say that it was a sort of a rendezvous for loafers, some of whom annoyed me considerably.

Q. 65. Did you ever hear Mr. Drawbaugh say anything about talking-machines, or did you see any such instruments about the shop?

Ans. I did not.

Q. 66. Will you look at the various instruments which have been placed on the table, and which are marked respectively "A," "B," "C," "D," "E," "F," "G," "I," "K," "L," "M," "N," "O," and "Q," and state whether you ever saw them or any of them at Mr. Drawbaugh's shop?

Ans. I have no recollection of seeing either of them.

Q. 67. Will you look at the instrument marked "C reproduced," and state how the magnet on it corresponds in size and shape with the magnet on the telegraph instrument, which you spoke of and which was carried to Mr. Zacharias' office, in Mechanicsburg?

[*Objected to by Mr. Hill, as utterly immaterial.*]

Ans. The horse-shoe magnet here represented is nearly the same in size and shape, while the electro-magnet, I think, is somewhat smaller.

Adjourned until December 11, 1882, at 10, A. M.

DECEMBER 11, 1882, 10, A. M.

Examination resumed pursuant to adjournment.

Present, Mr. Smith and Mr. Storrow for complainants and Mr. Hill for respondents.

Examination of David A. Hauck, by Mr. Smith, continued:

Q. 68. State whether or not you saw at Drawbaugh's shop, on your first visits there, or before he made the magneto key, any horseshoe magnets similar to that on "C reproduced."

Ans. I did not.

Q. 69. At the time he was getting up the key did you see him doing any work on horseshoe magnets? If so, state what it was, and what conversation, if any, you had with him about such magnets.

Ans. I saw him at work upon them: he either forged them or cut them out of sheet steel, filed them up, fitted them together; then tempered them; and I remember, in riveting one together he broke one of the sections, or one of the layers; he came and told me of his mishap, when I asked him why he did not leave them softer—they would not be so liable to break. When he answered that it was necessary to have them real hard; I don't remember whether he said they were to be hard all over, or at some particular point.

Q. 70. You have spoken of working personally at the shop at Eberly's Mills after you purchased the property. Did you employ other men there, and if so, will you state who they were, and as nearly as you can, when and how long they worked?

Ans. We had other men employed at work for us. One was J. B. Drawbaugh. He worked from the time we went there in July, 1873, pretty regularly for about a year. From that time until May, 1876, the time of our removal, he worked at intervals, probably fifty or sixty days during that time. We also had employed George Drawbaugh, a son of J. B. Drawbaugh, who, I think, worked during the summer of 1874. We also employed Edward Nicholas, who, I think, came there in March or April, 1874, and worked for us during the summer. Also a man named Davis Major, who worked there during the months of March and April, 1874, I think about eighteen or twenty days in the two months.

Q. 71. In your answer to the twenty-seventh interrogatory you referred to a due-bill which you gave to George Leonard for a balance of account. Will you hand that due-bill to the examiner to be made an exhibit in the case and copied into the record?

Ans. I will; here it is.

(The exhibit is marked by the examiner "Exhibit Hauck Due-bill" and is as follows:

"$13 45 MECHANICSBURG, *November* 22, 75.

Due Geo. Leonard,

Thirteen dollars and Forty five cents for value received.

D. A. HAUCK."

It is written in ink, and bears at the top, in pencil, the following: "Oct 12, 76, Eberlys Mills P. O." accompanied by another character resembling the letter "w," but which the examiner cannot decipher; it has on the back the following: "Geo Leonard vs." in pencil, and "D. Hauck $13 45" in ink.)

[*Due bill objected to by Mr. Hill as immaterial and irrelevant.*]

Q. 72. Did you, in 1879, have a controversy with Mr. Drawbaugh, concerning an invention relating to faucets, for which each of you had made an application for a patent, upon which applications an interference was declared by the Patent Office?

Ans. I did have such a controversy.

Cross-examined by Mr. Hill:

Cross-Q. 73. In your first answer, you state that you have resided in Mechanicsburg during the whole of your life, excepting a few months; where did you reside during those few months, and when was it?

Ans. I was in the United States service during the fall of 1864.

Cross-Q 74. The military service?

Ans. Yes, sir.

Cross-Q. 75. Drafted in?

Ans. No, sir.

Cross-Q. 76. To what command were you attached, and where did you serve?

Ans. I was in company I, One Hundred and Ninety-fifth Pennsylvania Volunteers. The principal time that I was in the service I spent at Monocacy Junction, near Frederick city, Maryland. A small portion of the time I was at a place called Hedgesville, in West Virginia.

Cross-Q. 77. Did you serve as a private?

Ans. I did not; I was a musician.

Cross-Q. 78. When, where, and with whom did you learn your trade as a machinist?

Ans. I think I commenced to work at the machinist trade exclusively, about the year 1869, at a shop belonging to my father and uncle, at Mechanicsburg, where I have since worked, with the exception of the time I was at Eberly's Mills, and also about a year that I worked at Harrisburg.

Cross-Q. 79. Give the names of your father and uncle, and the name under which they carried on business at Mechanicsburg at the shop where you commenced to work for them.

Ans. My father's name is George Hauck; and that of my uncle is Samuel Hauck; the firm name was S. & G. Hauck.

Cross-Q. 80. What business did they carry on at Mechanicsburg?

Ans. They manufacture agricultural implements and do a general foundry and machine business.

Cross-Q. 81. Are they still in that business there under the same firm name?

Ans. They are still in the business, but not under the same firm name: about two years ago Mr. George S. Comstock purchased an interest, and the firm name is now Hauck & Comstock.

Cross-Q. 81½. What did you do from the time you left the army until the time you went to work for S. & G. Hauck about 1869?

Ans. Immediately after leaving the army I went to school for a few months; a few days before or after the 22d of February, 1865, I went into the drug business, and continued in that until the fall of 1867, when I went to work for S. & G. Hauck, and worked in the wood shop until sometime in 1869.

Cross-Q. 82. Were you in the business of manufacturing or selling drugs from February, 1865 until the fall of 1867?

Ans. I was engaged in the retail drug business.

Cross-Q. 83. In what capacity?

Ans. Part of the time as clerk or assistant and part of the time as proprietor, or joint proprietor.

Cross-Q. 84. During what time as joint proprietor and with whom and where?

Ans I think I first became joint proprietor with Dr. J. J. Clark in the fall of 1865; I was joint proprietor with him for perhaps a year, when he sold his interest to John A. Eberly, who is my brother-in-law and I was joint proprietor with him until we sold out in the fall of 1867, during all the while in Mechanicsburg.

Cross Q. 85. To whom was the drug business sold in the fall of 1867?

Ans. To Dr. J. W. Coble.

Cross-Q. 86. You have stated that you did not become joint proprietor of the drug business until the fall of 1865; for whom were you clerking during the period from February until the fall of 1865, when you became joint proprietor?

Ans. For Dr. J. J. Clark.

Cross-Q. 87. You have stated that you worked a year in Harrisburg; when was that?

Ans. During the years 1871 and 1872.

Cross-Q. 88. What did you do there, and for whom did you work?

Ans. I worked for Willson Brothers in their machine shop.

Cross-Q. 89. When did you go to work for them, and when did you cease to work for them?

Ans. I first went to work in the fall of 1871, and worked until on or about the first of January, 1872; I then returned to Mechanicsburg for a short time, and worked for the Willson Brothers again during the summer of 1872. I worked there until fall, or well on towards the election.

Cross-Q. 90. Where did you reside while you were working for the Willson Brothers?

Ans. I resided in Mechanicsburg.

Cross-Q. 91. What did you do from January 1, 1872, until the summer of 1872, when you again went to work for Willson Brothers?

Ans. I worked for S. & G. Hauck, in Mechanicsburg.

Cross-Q. 92. What did you do from the fall of 1872, when you quit Willson Brothers, till you went into the faucet business in July, 1873?

Ans. I also worked for S. & G. Hauck, during that time.

Cross-Q. 93. What did you do from August, 1874, till May, 1876?

Ans. Part of the time I was traveling selling faucets; part of the time working for S. & G. Hauck, and some part of the time doing nothing.

Cross-Q. 94. What have you done from May, 1876, to the present time?

Ans. From May, 1876, until the last of June, 1876, I was working on faucets; during the early part of July I spent about ten days attending the Centennial Exhibition. After returning home, I again worked at intervals for S. & G. Hauck, and on faucets, until early in November, I think it was, when I again commenced the manufacture of faucets. I worked on them until the time I began to take my testimony in the interference above referred to. During the year 1879, my time was pretty well taken up attending to matters concerning the interference; after the final decision was made in that case, I again went to work for the firm of S. & G. Hauck, as it was then yet. It soon afterwards changed to Hauck & Comstock, and I have been working for them ever since.

Cross-Q. 95. From November, 1876, till the time of the interference, during which period you say you were manufacturing faucets, were you carrying on the business alone or did you have anybody associated with you; if the latter, who was it?

Ans. I think there is a mistake in that date. I think I said I went to the manufacture of faucets again, exclusively, in November, 1878, but I can answer, though. There were associated with me in the manufacture of faucets all the time G. W. Hauck, S. F. Hauck, and J. A. Eberly.

Cross-Q. 96. Am I to understand from your 94th answer, as now amended, that you again commenced the manufacture of faucets in November, 1878, and not in November, 1876?

Ans. There should be inserted "1878" after the word "November," in my 94th answer.

Cross-Q. 97. You say you spent ten days at the Centennial Exposition in July, 1876. Did you see any speaking telephones there?

Ans. I do not remember of seeing any.

Cross-Q. 98. Who worked with you for Willson Bros. in the fall of 1871?

Ans. Do you mean who else was working in the shop, or whether there was anyone else working particularly with me?

Cross-Q. 99. I mean both. Give the names of all the workmen that you can remember; their present residences, so far as you know; and state who of them worked more particularly with you, or near you.

Ans. John Gable, present residence Mechanicsburg; Albert L. Willson, a son of one of the proprietors, at present residing at Harrisburg. Joseph Forsyth; I don't know where he resides at present; Nelson Davenport; I don't know his present residence; Musser Shank, who, I think, still resides in Harrisburg; William Donnelly; I am not aware of his present residence; Loren A. Webster; I don't know his present residence; I haven't seen him for five or six years; George Murray, who still resides in Harrisburg; Theodore Jones, whose residence, I think, is in Harrisburg; Isaac Kauffman, who resides in Mechanicsburg; Isaac Zarker, who resides in Harrisburg. I believe those are all the names I can recall at present. Those who worked near me were A. L. Willson, L. A. Webster. Mr. Gable worked near me part of the time, and Mr. Forsyth; all above mentioned; and Musser Shank. That is all that worked near me.

Cross-Q. 100. Answer the same questions as to the workmen who worked with you for Willson Brothers in the summer and fall of 1872.

Ans. My previous answer refers to both periods of my working there.

Cross-Q. 101. Now tell me which of the persons mentioned in your 99th answer worked with you there in 1871, and which of them worked with you there in the summer and fall of 1872?

Ans. In 1871 there were Davenport, Webster, Gable, Murray, and, I think, Jones; I am not positive as to Jones in 1871; I recall another, Frank Hillegas; in 1872 there were Donnelly, Forsyth, Zarker, Jones, Kauffman, A. L. Wilson; I guess that includes them all. Hillegas resides in Harrisburg; I won't say that he resides there now, but he did a few years ago; I haven't seen him for several years.

Cross-Q. 102. You state in your 18th answer that the parties who, in July, 1873, purchased of William R. Gorgas and others the property of the Drawbaugh Manufacturing Company, were George W. Hauck, D. A. Hauck, S. F. Hauck and John A. Eberly; and in your 95th answer you state in substance that George W. Hauck, S. F. Hauck and John A. Eberly continued to be associated with you in the faucet business so long as you carried it on: under what firm name did those parties, George W. Hauck, D A. Hauck, S. F. Hauck, and John A. Eberly associate themselves and carry on the business?

Ans. The firm was styled Hauck Brothers and Company.

Cross-Q. 103. Which of the parties were brothers?

Ans. G. W. & S. F. Hauck.

Cross-Q. 104. Are they relatives of yours; if so, how?

Ans. They are cousins.

Recess for lunch, until 2.15, P. M.

DECEMBER 11, 1882, 2.15, P. M.

Examination resumed.

Present, Mr. Smith and Mr. Storrow for complainants, and Mr. Hill and Mr. Jacobs for respondents.

Cross-examination of David A. Hauck by Mr. Hill, continued:

Cross-Q. 105. Will you give me the names and residences of all the workmen employed by Hauck Brothers & Co., at different times, and state the time or times when they were severally employed?

Ans. J. B. Drawbaugh in our employ from July, 1873, I think until the fall of 1875, but worked for us principally during 1873 and 1874. Residence, Eberly's Mills, Pennsylvania. George Drawbaugh, son of J. B. Drawbaugh, worked for us during the summer of 1874. I don't know what time he commenced or when he quit exactly, but think he quit towards the fall. He worked during the summer, I know. I think he now resides at Eberly's Mills. Edward Nicholas worked for us during the summer of 1874 also. I think he began in April and quit in July. I am not certain about that, though. His residence is Bridgeport, Pennsylvania. Davis Major worked for us in March and April, 1874, and in June and July, 1876. His residence is near Mechanicsburg. Preston Heffelfinger, I think, worked for us in the fall of 1876, for a few months. His present residence is Mechanicsburg. Harmon K. Drawbaugh worked for us from the beginning of December, 1878, till some time in the spring of 1879. I don't remember what month—April or May or somewhere along there. These are all the persons that were regularly employed by us.

Cross-Q. 106. Give the names and residences of the persons who were irregularly employed by your said firm, and give the time when they were so employed.

Ans. By my previous answer, I mean that these are all the persons we had employed to do work for us, with our tools, on our premises.

Cross-Q. 107. State how many, and which of these persons whom you have mentioned worked for Hauck Bros. & Co., in the shop which they occupied at Eberly's Mills.

Ans. J. B. Drawbaugh, George Drawbaugh, Edward Nicholas, Davis Major.

Cross-Q. 108. Give the names and present residences, so far as you know them, of all the employés of S. & G. Hauck at the different times when you have worked for them.

Ans. That I cannot do. There would be several hundred.

Cross-Q. 109. Then give me the names and residences of fifteen or twenty of them who have worked there with you the most.

Ans. William Klinedinst, residence Mechanicsburg; Joseph R. Potts, Mechanicsburg; John C. Moore, Mechanicsburg; Preston Heffelfinger, Mechanicsburg; C. M. Hyers, Mechanicsburg; Davis Major, near Mechanicsburg; A. S. Martin, Mechanicsburg; Benjamin Landis, Mechanicsburg; Martin Arnold, Mechanicsburg; D. B. Binder, Mechanicsburg; John S. Weaver, Mechanicsburg; Samuel Landis, Mechanicsburg; B. C. Painter, Mechanicsburg; Adolphe Slape, Mechanicsburg; Parker Moore, Mechanicsburg; John M. Landis, Mechanicsburg; James Ready, Mechanicsburg; Abner Mohler, Mechanicsburg; John Smith, Mechanicsburg; Jacob Duey, Mechanicsburg.

Cross-Q. 110 What books did the firm of Hauck Brothers & Company keep relating to their manufactures, sales or employment of workmen, during the time covered by your testimony?

Ans. G. W. Hauck did all the bookkeeping and attended to the financial part of the business, and as he has a peculiar way of keeping books, I am not able to tell what books were used.

Cross-Q. 111. Are you able to tell whether the books showed the names of the workmen and the times of their employment?

Ans. His books did not, but a book which I kept showed the time of their employment, as to all except H. K. Drawbaugh; which book has been mislaid.

Cross-Q. 112. What period was covered by the entries in that book which you kept?

Ans. From the time of our starting business in July, 1873, until November or December, 1876.

Cross-Q. 113. When did that book disappear?

Ans. I do not know; I have not saw it for a year, perhaps more.

Cross-Q. 114. What search have you made for it, if any?

Ans. I have searched for it thoroughly.

Cross-Q. 115. When?

Ans. During the last six months.

Cross-Q. 116. Why?

Ans. I wanted to help fix the time I was engaged at Eberly's Mills.

Cross-Q. 117. Would it have shown the days when you were at Eberly's Mills?

Ans. It would.

Cross-Q. 118. When did you first talk with any representative of the complainants with reference to any matters bearing upon this suit?

Ans. As near as I can tell, about a year and a half, or between that and two years ago.

Cross-Q. 119. Give the name of the person with you then talked about said matters.

Ans. It was Mr. Fred. Weeks.

Cross-Q. 120. Do you know of any other name by which Mr. Fred. Weeks goes?

Ans. I do not.

Cross-Q. 121. Do you know where he professed to reside?

Ans. I am not positive, but think he told me he resided in Boston, Mass.

Cross-Q. 122. How many conversations did you have with him on the subject?

Ans. As many as four, and perhaps six.

Cross-Q. 123. Covering about what length of time in all, from the first to the last?

Ans. As near as I can recollect, from eight to ten months.

Cross-Q. 124. Give the time of the last conversation that you had with him.

Ans. I am unable to do so.

Cross-Q. 125. State it as near as you can.

Ans. It may be a little over a year ago, probably a year and a half.

Cross-Q. 126. At the time of the first conversation which you had with him, do you know whether the motion for a preliminary injunction in this case was pending or not?

Ans. I do not.

Cross-Q. 127. Where was that first conversation with him?

Ans. At the establishment of Hauck & Comstock, Mechanicsburg.

Cross-Q. 128. Was any person present at it besides yourself and Weeks?

Ans. There was not.

Cross-Q. 129. What time of year was it?

Ans. I do not recollect.

Cross-Q. 130. Do you not remember whether it was warm weather or cold?

Ans. My recollection is, that the weather was rather pleasant, but not midsummer.

Cross-Q. 131. Do you know whether this suit had been begun, at that time?

Ans. I do not.

Cross-Q. 132. Did you understand anything about it from Weeks—whether it had been begun or not?

Ans. I cannot say that I did so understand, while I am not entirely certain that he didn't mention something about it; but I can neither recall his language nor the meaning thereof.

Cross-Q. 133. Did you ever have any conversation with Mr. Weeks at which any other person was present, besides yourself and him?

Ans. Do you mean any other conversation, or a conversation regarding this controversy?

Cross-Q. 134. I mean any conversation regarding this controversy, or the subject matter of your recollection about facts relating to this controversy.

Ans. I do not remember of a third person being present at any of our conversations.

Cross-Q. 135. What time of the year was the last conversation that you had with Weeks about the matter?

Ans. I really do not remember when I had the last one, or what time of the year it was.

Cross-Q. 136. Do you remember where it was, and whether the weather was warm or cold at the time?

Ans. I do not.

Cross-Q. 137. What other other representatives of the complainants have you ever talked with about this case, or any of the facts relating thereto?

Ans. Mr. Storrow, Mr. Smith and Mr. Comfort.

Cross-Q. 138. When and where did you first talk to Mr. Storrow or Mr. Smith about it?

Ans. With Mr. Storrow in Harrisburg a few months—perhaps as many as six months—after my last conversation with Mr. Weeks, and with Mr. Smith in Hauck and Comstock's office in Mechanicsburg some time after that.

Cross-Q. 139. Fix the date of your first conversation with Mr. Storrow as nearly as you can.

Ans. I have no means at hand to fix any date.

Cross-Q. 140. Was it at the Bolton House, Harrisburg?

Ans. It was.

Cross-Q. 141. Did you register there at the time?

Ans. I did not.

Cross-Q. 142. Did you have any other business there at Harrisburg that day, except to see Mr. Storrow, by which the time can be fixed?

Ans. I did not.

Cross-Q. 143. When did you first talk with John C. Comfort about this case?

Ans. I cannot fix the time.

Cross-Q. 144. How many times have you talked with him about it?

Ans. Perhaps three or four.

Cross-Q. 145. Was Mr. Weeks boarding at Mechanicsburg at any time covered by your conversation with him?

Ans. I think he was.

Cross-Q. 146. Where did he board?

Ans. At the American House.

Cross-Q. 147. Was he boarding there at the time of your first conversation with him?

Ans. I cannot say.

Cross-Q. 148. Did you ever show any of these representatives of the complainants the book which you say disappeared about a year ago?

Ans. I think I did.

Cross-Q. 149 To whom did you show it?

Ans. I am reasonably certain that I showed it to Mr. Weeks, but not certain as to any other.

Cross-Q. 150. Have you any impression on your mind of showing it to any of the other gentlemen you have mentioned, Mr. Storrow, Mr. Comfort, or Mr. Smith?

(After question 149 was answered, and before question 150 was put, Mr. Storrow stated to Mr. Hill that the memorandum-book was shown to him by Mr. Hauck, and that he (Mr. Storrow) made, not a copy of it, but a memorandum from it, at the time, and that he proposes to put that fact into the record somewhere, and that he will show his said memorandum to respondents' counsel, if he desires to see it. This is now noted at Mr. Hill's request.)

Ans. I have no distinct recollection of showing it to anyone but Mr. Weeks.

Cross-Q. 151. Is the firm of Hauck Bros. & Co. still in existence, or has it been dissolved?

Ans. The partnership has not been dissolved, but at present they are not engaged in business.

Cross-Q. 152. When did they go out of business?

Ans. I might qualify my previous answer by stating that we are still disposing of some faucets, although we have sold nearly all of our machinery. · Therefore, I cannot say that we have gone out of business entirely as yet.

Cross-Q. 153. When your firm purchased the property at Eberly's Mills in July, 1873, did it put in any new machinery in the shop at Eberly's Mills, or did it continue to work with the old machinery already there?

Ans. We put in no new machinery, but improved some of the machinery then in use.

Cross-Q. 154. State what improvements you made and what workmen did the work in making them.

Ans. One consisted in using a fluted reamer, guided by a mandrel, for boring the chamber, or body, of the faucet, making them all of a standard size, whereas by the old mode of boring with an ordinary lathe-tool, the size of the bore would vary according to the skill of the operator. I constructed this myself. Another was the substitution of a jointed lathe tool for a rigid lathe tool in turning the hubs of two-point wheels. The advantage gained was, that the work did not revolve continuously, but oscillated, and in going backwards broke the point, or cutting edge, of the rigid tool, while the jointed tool, yielding upon pressure, remained intact, and avoided frequent grinding or dressing. I did some of the work on that. This man Major, whom I had employed, started it—roughed it out—and I finished it. That is all. I don't mean by that, that those were all the improvements we made. There were others of minor importance.

Cross-Q. 155. That building which your firm occupied as a shop at Eberly's Mills, has been described as a building containing a cellar or basement, a first floor, a second floor, and an attic; will you please state the location of all the machinery which was used by your firm in making faucets there, having reference to whether it was in the cellar or the first floor, or the second floor, or in the attic?

Ans. Our machinery was all on the first floor, except the machinery for making strainers, and a turning-lathe on which we turned the wood handles, which was in the south room on the second floor.

Cross-Q. 156. On what floor did J. B. Drawbaugh do his work while he was there?

Ans. Principally on the first floor.

Cross-Q. 157. What did he do?

Ans. Most of the time he was engaged in fitting up the faucets; sometimes he did lathe-work on all parts of the faucets.

Cross-Q. 158. So far as he did any work on the second floor, what was that work?

Ans. If any, it was painting the faucets or turning wood handles or making strainers, but I think he did very little of either, as the principal part of the painting was done on the first floor, and I made a great many or nearly all of the wood handles and strainers myself.

Cross-Q. 159. On what floor did George W. Drawbaugh do his work while he was there?

Ans. On the first floor; these answers have reference to the time when these men were working for me or for Hauck Bros. & Co. They were working sometimes when they were not working for us, and then they were working upstairs.

Cross-Q. 160. On what floor did Edward Nicholas do his work for Hauck Bros. & Co.?

Ans. Principally on the first floor, although he may have did a little painting and a little work on strainers on the second floor.

Cross-Q. 161. On what floor did Davis Major do his work for your firm?

Ans. On the first floor only.

Cross-Q. 162. What was his work?

Ans. Boring the chamber or body of the faucet.

Cross-Q. 163. What was Edward Nicholas' work?

Ans. Principally centering and turning the two and five-point wheels, or cams.

Cross-Q. 164. Did Nicholas or Major do any other work at that shop, so far as you know, except what they did for Hauck Bros & Co.?

Ans. I am not aware that they did any work for any other person.

Cross-Q. 165. Did you do any work there, except for your firm?

Ans. Not that I can remember of.

Cross-Q. 166. What machinery did you move away from that shop in May, 1876?

Ans. We moved the shafting, pulleys, and belting, which were on the first floor; three small engine-lathes, one speed or hand-turning lathe; one special machine for turning the hub of the two-point wheel, a special machine for finishing the lid of the faucet, a drill-press, the machinery for making strainers, which was on the second floor, together with the small tools and appliances used in the manufacture of the faucets.

Cross-Q. 167. Did you leave any machinery there after May, 1876, which belonged to your firm? If so, what?

Ans. We did. There remained a large engine-lathe, a large column drill-press, and the wood-turning lathe before mentioned as being upstairs.

Cross-Q. 168. How long did that machinery remain there after May, 1876, and what finally became of it?

Ans. The large lathe mentioned we rented to George A. Plank, and it was removed in the summer of 1877 or 1878, I think; I think it was before 1879, but am not positive, though, to his shop in Churchtown, Cumberland county. The drill-press we sold to E. W. Chellis of Harrisburg about a year ago; I don't know what he did with it. The wood turning lathe, spoken of as being upstairs, we have not yet removed, and I suppose it is still there.

Cross-Q. 169. Were you at that shop at any time during the year 1876, after May?

Ans. Not that I can remember.

Cross-Q. 170. Were you there during the year 1877, at any time?

Ans. I think I was there two or, perhaps, three times during that year, but can fix no date.

Cross-Q. 171. Were you there at any time during the year 1878?

Ans. I think I was there a few times during 1878, also.

Cross-Q. 172. Do you remember what you were there for in 1877, at any time?

Ans. I was there twice in company with George A. Plank to look at the lathe we rented to him, and at another time to look at some shafting and pulleys, which I afterwards sold him.

Cross-Q. 173. In what part of the shop were the shafting and pulleys, which you afterwards sold him?

Ans. They were fastened or hanging overhead in the rooms on the second floor.

Cross-Q. 174. When you were there with Mr. Plank in 1877, did you, on either occasion, see Mr. Daniel Drawbaugh there?

Ans. I am quite positive I saw him at one of the visits, but not positive as to the other.

Cross-Q. 175. Did you see any telephones there in 1877?

Ans. I did not.

Cross-Q. 176. What were you there for in 1878?

Ans. I went there with Mr. Plank to help him load the lathe before mentioned, in which Daniel Drawbaugh and J. B. Drawbaugh both assisted.

Cross-Q. 177. At what time in 1878 was that?

Ans. I am not certain that it was in 1878. I think I said before that it was either in 1878 or 1879. It was in the summer, I think.

Cross-Q. 178. Was it before or after the faucet interference commenced?

Ans. I am impressed to believe it was before, but the removal of the shafting which was upstairs, was after the beginning of the faucet interference.

Cross-Q. 179. Have you any doubt about the lathe being removed before the faucet interference commenced?

Ans. At present, I have.

Cross-Q. 180. What were they doing in the shop at the time the lathe was removed?

Ans. I cannot remember.

Cross-Q. 181. What parts of the shop were you in at the time the lathe was removed?

Ans. Principally on the first floor, although I think I went to the attic or garret to fasten the block and tackle we used to swing the lathe-bed out of the shop to the wagon.

Cross-Q. 182. You went through Drawbaugh's private room, then, did you?

Ans. I did.

Cross-Q. 183. Did you see any telephones there or about the shop?

Ans. I did not, as I went through the room hurriedly, and would not have seen them had they been there.

Cross-Q. 184. You have spoken of a lathe that you removed at that time, and of some pulleys and shafting that you removed afterwards; how long was the lathe removed before said pulleys and shafting were removed?

Ans. Probably nine months or a year, although it might have been only a few months. I have no distinct recollection of the time that elapsed.

Cross-Q. 185. Were the pulleys and shafting removed while the interference was pending?

Ans. I think they were.

Cross-Q. 186. In what season of the year were they removed?

Ans. In the spring or summer.

Cross-Q. 187. Do you think the lathe was removed the summer before?

Ans. That is my impression at present.

Cross-Q. 188. Who, if anybody, assisted in removing the pulleys and shafting?

Ans. George A. Plank assisted me, or rather I assisted him. I had sold it to him, and it was his then. There may have been others, but I am not positive about it.

Cross-Q. 189. Have you any paper, book-entry, or memorandum to show the date of the delivery of that lathe, or to show the date of the delivery of those pulleys and that shafting to Mr. Plank?

Ans. I have not.

Cross-Q. 190. Has your firm?

Ans. Not that I know of.

Cross-Q. 191. Did Mr. Plank pay for the lathe at the time he bought it?

Ans. I can only answer by saying that he didn't buy the lathe, but only rented it; he didn't pay any rent on it then, and in fact never did.

Cross-Q. 192. Did he pay for the shafting and pulleys at the time he got them?

Ans. I think he paid a small portion of it in cash and for the balance he transferred to us a note he had received from some farmer in the neighborhood in payment for a reaping machine, that he had sold him, which note we had discounted; after which we had nothing more to do with it, as it was paid when it matured.

Cross-Q. 193. At what bank did you have that note discounted?

Ans. At the First National Bank of Mechanicsburg.

Cross-Q. 194. The taking of the testimony in the faucet interference was going on both before and after you delivered the shafting and pulleys to Mr. Plank, was it not?

Ans. That is my impression.

Cross-Q. 195. Did you see any telephones there at the time of the delivery of the shafting and pulleys to Mr. Plank?

Ans. I did not.

Cross-Q. 196. Were you there at Mr. Drawbaugh's shop at any other time in 1878, except when the lathe was delivered to Mr. Plank?

Ans. I may have been there sometime previous to delivering the lathe, with Mr. Plank to examine it, but do not think I was there any other time during the year.

Cross-Q. 197. Were you there at any time during the year 1879, except when the shafting and pulleys were delivered to Mr. Plank?

Ans. I was, on the 15th of January.

Cross-Q. 198. Were you there at any other time during the year 1879, except those two occasions?

Ans. Not that I can remember. I was there again during the following winter.

Cross-Q. 199. Do you mean the winter of 1879-80?

Ans. Yes. I was going to add that it might have been after the 1st of January, 1880.

Cross-Q. 200. Have you ever been there since that time?

Ans. Not that I can remember.

Cross Q. 201. Did you see any telephones there in 1879 or 1880?

Ans. I did not.

Adjourned until December 12, 1882, at ten, A. M.

DECEMBER 12, 1882, 10, A. M.

Examination resumed pursuant to adjournment.

Present, Mr. Smith and Mr. Storrow, for complainants, and Mr. Hill and Mr. Jacobs for respondents.

Cross-examination of David A. Hauck, by Mr. Hill, continued:

Cross-Q. 202. You state that you were at Drawbaugh's shop in May, 1876, when you moved the machinery, and you were there again on the fifteenth day of January, 1879; you do not recollect any particular occasion when you were there between those dates, do you?

Ans. No more than the time of moving the large lathe before mentioned, which was either in the summer of 1877 or 1878.

Cross-Q. 203. Are you positive that it was either in the summer of 1877 or 1878?

Ans. Not positive, but I think so.

Cross-Q. 204. Which summer do you think it was?

Ans. I rather think, in 1878.

Cross-Q. 205. You have spoken of being at the shop with Mr. Plank, once or twice before the lathe was removed, to enable him to examine it; have you any idea how long those visits were before the lathe was removed?

Ans. One of them was, I think, in the month of April, 1877, and another about a year afterwards.

Cross-Q. 206. Are there any circumstances by which you fix those two dates?

Ans. On the occasion of the first visit spoken of, when we returned to Mechanicsburg, there was a building burning in the eastern portion of the town, and it became impressed on my mind, by some means that I do not remember, that that building was burned during the month of April, 1877; it was a barn or stable belonging to Mr. S. P. Gorgas that was burned.

Cross-Q. 207. Was that at the time of the first visit that you and Mr. Plank made?

Ans. It was.

Cross-Q. 208. Is there any circumstance by which the time of your second visit there with Mr. Plank can be fixed?

Ans. None but the lapse of time, which I suppose was about a year.

Cross-Q. 209. Is there any circumstance by which the time of the delivery of the lathe can be fixed?

Ans. I have no means at hand of fixing the time.

Cross-Q. 210. What parts of the shop did you go through at the time of your first visit with Mr. Plank?

Ans. On the occasion of that visit, I think we examined the shaft and pulleys which were upstairs; I think that was the purpose of going there at that time, and the examination of the lathe was incidental; I think we spent the greater portion of the time, upstairs in the south room.

Cross-Q. 211. Did you see Daniel Drawbaugh there at that time?

Ans. I think I did; I am not positive.

Cross-Q. 212. Were you in his private office at that time?

Ans. I think not.

Cross-Q. 213. Who else did you see there at the shop at that time?

Ans. I cannot recall having seen any other person.

Cross-Q. 214. What parts of the shop were you in on the occasion of your second visit to the shop with Mr. Plank, which you think was in the spring of 1878?

Ans. I think we were on the first floor only.

Cross-Q. 215. How long do you think that second visit was before the lathe was delivered to Mr. Plank?

Ans. A few months; probably from two to four.

Cross-Q. 216. Did you superintend the work of removing the machinery in May, 1876?

Ans. I did.

Cross-Q. 217. How many times were you in Drawbaugh's shop in that month?

Ans. Four times, I think.

Cross-Q. 218. Do you remember being in his private office at any one of those four times?

Ans. I am pretty certain I was; I think I made a pretty thorough search or examination of every part of the building, in company with Mr. Daniel Drawbaugh, for small tools that were scattered around; Mr. Drawbaugh telling me which of the tools belonged to the Drawbaugh Manufacturing Company, and which were his individually.

Cross-Q. 219. Are you willing to swear that you were in his private room at any time during May, 1876?

Ans. I am reasonably certain that I got some tools from the loft or attic, and was obliged to pass through his private room to get there.

Cross-Q. 220. Will you swear that you were in that room, during that month, in any other way than as just passing through to the attic and back?

Ans. I will not.

Cross-Q. 221. Were you at Drawbaugh's shop at any time between the first of January, 1876, and the first of May, 1876?

Ans. I think not.

Cross-Q. 222. Were you there at any time during the year 1875?

Ans. I am not certain as to more than once, which, I think, was early in the spring.

Cross-Q. 223. Was it in February, March, or April?

Ans. One of those months, I think.

Cross-Q. 224. What was the occasion of your going there at that time?

Ans. To get some measuring faucets.

Cross-Q. 225. Faucets to fill any particular order?

Ans. I think not.

Cross-Q. 226. Did you get any; if so, how many?

Ans. As near as I can recollect, it was three dozen.

Cross-Q. 227. Do you remember what was done with that three dozen faucets?

Ans. I do not.

Cross-Q. 228. Did anybody go with you to Drawbaugh's shop on that occasion; if so, who?

Ans. I was accompanied by my cousin, S. F. Hauck.

Cross-Q. 229. How did you go?

Ans. By private conveyance.

Cross-Q. 230. Did you ever go there with S. F. Hauck, in a private conveyance, to get faucets, at any other time than that?

Ans. I did, several times.

Cross-Q. 231. When—in 1874?

Ans. I do not remember exactly the time of our several visits, but remember the one spoken of distinctly, because at the time of that visit Daniel Drawbaugh showed us an automatic fire-alarm which he had constructed, which I had not seen before, and about which my cousin and I had a controversy on the way home.

Cross-Q. 232. Had you ever seen any automatic fire-alarm at his shop before?

Ans. I had not.

Cross-Q. 233. How long were you at his shop on that occasion?

Ans. Perhaps an hour.

Cross-Q. 234. In what parts of the shop were you at that time?

Ans. On the first floor, and in Daniel Drawbaugh's work-shop, and the large south room on the second floor, which contained the axle company's machinery.

Cross-Q. 235. What do you mean by the expression, "Daniel Drawbaugh's work-shop?"

Ans. I mean the north-west room on the second floor.

Cross-Q. 236. Then you were not, at that time, in his private room or office—the north-east room—were you?

Ans. I am not positive, but think not.

Cross-Q. 237. In what room did he show you the automatic fire-alarm?

Ans. The instrument proper was placed by the stove in the large south room, and the bell or gong, which it caused to ring, was in the north-west room, or his work-shop.

Cross-Q. 238. Describe that automatic fire-alarm which you then saw, including the entire device and its connections.

Ans. As near as I can recollect, it consisted of a strip or bar of copper, or some other metal, very sensitive to a change of temperature, which expanded under an increased temperature and either completed or broke an electric current, which caused the ringing of a bell; I do not remember whether the current was generated by a chemical battery or horse-shoe magnet; it was one or the other.

Cross-Q. 239. Describe the bell apparatus more particularly.

Ans. I can give no correct description of it, as it was fastened to the ceiling, or to the wall near the ceiling.

Cross-Q. 240. In what part of the room was it fastened?

Ans. I am not positive, but think in the north-west or south-east corner.

Cross-Q. 241. How large was it?

Ans. I cannot say: I don't remember whether it was an ordinary shaped bell or a gong.

Cross-Q. 242. Was it included in a case, or were the works exposed?

Ans. I think it was exposed; the whole apparatus had an appearance of being rudely and temporarily constructed.

Cross-Q. 243. Did you see any body else at the shop, at the time of that visit; if so, whom?

Ans. I saw J. B. Drawbaugh, a young man named Kahney, whose first name I don't know; there may have been others, but I can't recall them now.

Cross-Q. 244. Do you know whether Kahney's first name was Ira or Norman?

Ans. I do not.

Cross-Q. 245. What were young Kahney and J. B. Drawbaugh doing there at that time?

Ans. J. B. Drawbaugh was finishing the faucets we took away, on an emery wheel belonging to the axle company: I cannot remember what Kahney was doing, if anything.

Cross-Q. 246. Were the manufacturing operations of the axle company going on there at that time, or was it before they had got started in manufacturing?

Ans. They had been manufacturing, but were not in active operation at the time.

Cross-Q. 247. Do you remember of any particular occasion when you were there at Daniel Drawbaugh's shop, between August, 1874, and January, 1875?

Ans. I do not.

Cross-Q. 248. Now, taking the time from the latter part of June, 1873, to the last of August, 1874, during that time, I understand you to say, in substance, that you were at Daniel Drawbaugh's shop something over a hundred times: am I correct?

Ans. I do not think I limited the time to the last of August, 1874: the time ran on until the latter part of May, 1876.

Cross-Q. 249. From the time when your firm took possession of the shop at Eberly's Mills, until the first of August, 1874, which of your firm had occasion to be most often at the shop at Eberly's Mills?

Ans. Myself.

Cross-Q. 250. Was your firm running any other shop during that time?

Ans. The firm of Hauck Brothers & Co. was not, but G. W. and S. F. Hauck were running a tin and stove establishment at Mechanicsburg, under the firm name of Hauck & Co.

Cross-Q. 251. Where was John A. Eberly, and what was he doing during that period, from the first of July, 1873, to the latter part of August, 1874?

Ans. He was operating a leather net and harness manufactory at Mechanicsburg, part of the time, under the firm name of Eberly & Burkholder, and latterly as J. A. Eberly & Co.

Cross-Q. 252. Have George W. Hauck and S. F. Hauck been engaged in the tin and stove business at Mechanicsburg from July, 1873, to the present time?

Ans. They have, but not under the original firm name.

Cross-Q. 253. Has John A. Eberly been engaged in the harness and leather net business at Mechanicsburg from July, 1873, to the present time?

Ans. He has not.

Cross-Q. 254. State where he has been and what he has been doing—and give the dates, as nearly as you can—from the first of July, 1873, to the beginning of 1879.

Ans. He ran the net and harness factory until the spring of 1876 or 1877, when he removed to Kansas, and has been there ever since, with the exception of one year, during which he lived in Charleston, West Virginia.

Cross-Q. 255. Did he remove to Kansas before you removed the machinery from Drawbaugh's shop, in May, 1876?

Ans. I am not positive, but think he removed to Kansas in April, 1876.

Cross-Q. 256. When did the firm of Hauck & Co. change their firm name, and what changes have been made in it?

Ans. It was changed about two years ago, and is now run under the name of G. W. Hauck; S. F. Hauck being a silent partner.

Cross-Q. 257. Did the firm of Hauck & Co. run a store and a manufacturing shop?

Ans. They did.

Cross-Q. 258. I suppose the private business of Hauck & Co. and John A. Eberly monopolized most of their time, devolving the faucet business mainly upon you. Was such the fact?

Ans. It is. In explanation, I would say, I had charge of the mechanical part of the business, while G. W. Hauck attended to the books and financial matters.

Cross-Q. 259. Where was the business of attending to the books and financial matters transacted—at Eberly's Mills or Mechanicsburg?

Ans. In Hauck & Co.'s office, at Mechanicsburg.

Cross-Q. 260. What did S. F. Hauck and John A. Eberly have to do as members of the firm of Hauck Bros. & Co., prior to the removal of the machinery to Mechanicsburg?

Ans. They both traveled, introducing and selling, while S. F. Hauck only was with me a few days at Eberly's Mills, working in the shop.

Cross-Q. 261. Was he with you a few days continuously, or at different times?

Ans. At different times; at intervals.

Cross-Q. 262. In what year?

Ans. In 1873 and 1874.

Cross-Q. 263. How came he to be there then—because the work was crowding at those times?

Ans. I might say he went for a mere whim or out of curiosity; I did not solicit his assistance.

Recess for lunch, until two, P. M.

DECEMBER 12, 1882, 2, P. M.

Examination resumed pursuant to adjournment.

Present, same counsel.

Cross-examination of David A. Hauck, by Mr. Hill, continued:

Cross-Q. 264. To whom did you sell any machinery from the Drawbaugh shop in the latter part of 1874, the year 1875, or the early part of 1876?

Ans. We sold none during that time, but removed a milling machine in the latter part of 1873 or early in 1874, and a lathe some time in 1875, to the shop of S. & G. Hauck, in Mechanicsburg.

Cross-Q. 265. Did you go to Drawbaugh's shop, at Eberly's Mills, at any time within the period covered by my last question, in company with a gentleman to whom you sold any machinery?

Ans. I think not.

Cross-Q. 266. You don't know of any such person to whom you sold machinery during that time, do you?

Ans. I do not; I am reasonably certain we sold no machinery until some time after we removed to Mechanicsburg.

Cross-Q. 267. In your 31st question, complainants' counsel asked you: "During the latter part of 1874, the year 1875, and the early part of 1876, how often did you go to the shop, and for what purpose? Answer: I might have been there five or six times; several times I went for faucets, and once or twice in company with a gentleman to whom I sold some machinery, and then I was there two or three days removing the machinery." Now, if you were never there during the latter part of 1874, the year 1875, or the early part of 1876, in company with a gentleman to whom you sold any machinery, and never sold any machinery to any gentleman during that period, as you now testify, what did you mean by your 31st answer?

Ans. I meant that I was there to look at the shafting which I subsequently sold him; but not until a year or a year and a half after we removed the large lathe spoken of; the gentleman saying at the time that the shaft was heavier than he needed, and that he could get a lighter one for less money, which he told me he did. After getting the large lathe, before mentioned, and some other tools in his shop, he found his shaft was too light, and then bought of us the one we examined at the visit spoken of.

Cross-Q. 268. That gentleman was Mr. Plank, was it?

Ans. It was.

Cross-Q. 269. According to your 31st answer above quoted, you testified in substance that Mr. Plank was there with you once or twice in the period comprising the latter part of 1874, the year 1875, and the early part of 1876; you have since testified in substance that his visits there were in 1877 and 1878; your 31st answer was erroneous; was it?

Ans. That is a mistake; I evidently made that answer under the impression that the question related to the whole time we were there. Mr. Plank's visits did not commence until after 1876; that is, 1875. I meant to say, during 1876, or after 1875.

Cross-Q. 270. Do you now mean to say that any of Mr. Plank's visits with you were during 1876?

Ans. I cannot say so positively.

Cross-Q. 271. What is your impression about it?

Ans. It is, that the first one was at least six months or perhaps a year after we removed the machinery to Mechanicsburg; I remember when he first came to me about purchasing the shafting; I was working at the shop in Mechanicsburg, and we there examined a lot of pulleys that I had brought there from Eberly's Mills, but did not have in use.

Cross-Q. 272. Referring to the first visit which you made to Drawbaugh's shop in the latter part of June, 1873, state whether Mr. Drawbaugh showed you any machines there of his own invention at that time; and if so, mention all of them that you saw.

Ans. He showed me a great many machines, but I do not know that he claimed specifically to have invented them. I can't mention the machines that he invented, because he didn't claim to have invented any; I can mention those that he showed me.

Cross-Q. 273. Mention all those that he showed you at that time, that you were impressed to believe were his inventions.

(Witness now draws a paper from his pocket, opens it, and glances at it, and is interrupted by Mr. Hill, when witness says: "I was going to ask whether I might be permitted to refer to a memorandum;" to which Mr. Hill replies, "No.")

Ans. He showed me a weather indicator; two stamp cancellers; a steam syphon, or pump; an automatic boiler feeder; a clock, which was either in course of construction or completed—I can't remember whether it was completed at the time or not—which was to be propelled by another clock, by an electric current; a pressure blower; a hydraulic ram. That is all that I can recall from memory. I believed at the time that these were his inventions, from his manner of explaining to me their construction.

Cross-Q. 274. Now, if you please, you may produce and put in evidence the memorandum which you just took from your pocket.

Ans. I will explain, in this connection, that this memoranda contains the names of all the machines or appliances that I can recall ever having seen there, constructed or invented by Daniel Drawbaugh, with the exception of the rotary measuring faucet, which he had patented in 1866, and which we bought.

(Witness produces memorandum, which is as follows:

"1. Machine for insulating wire.
2. Steam syphon, or steam pump.
3. Automatic boiler feeder.
4. Postage stamp cancellor.
5. Carpet-rag needle.
6. Printing telegraph.
7. Horse-shoe magnetic telegraph.
8. Automatic fire-alarm.
9. Magnetic clocks of several varieties.
10. Pressure blower.
11. Weather indicator.
12. Automatic nail-plate feeder.
13. Mill-stone tram.
14. Hydraulic ram."

Respondents' counsel requests that the list be not at present read to the witness.

Mr. Smith requests the examiner to read the paper as part of the answer of the witness.

Mr. Hill requests that the paper be not read at present to the witness, as he desires to cross-examine him further upon it first.

The paper is not read to the witness.)

Cross-Q. 275. Who made that memorandum which you have just produced?

Ans. I made it.

Cross-Q. 276. When did you make it?

Ans. Within the last three days.

Cross-Q. 277. Was it since you commenced this deposition?

Ans. I think it was.

Cross-Q. 278. Where did you make it?

Ans. In the room I occupy in this building.

Cross-Q. 279. Was any person present with you when you made it; if so, who?

Ans. There was not.

Cross-Q. 280. You say you think you made it since you commenced this deposition; don't you know whether you did or not?

Ans. I am not positive, but I think I commenced making it in the evening preceding the day I began my deposition.

Cross-Q. 281. Why did you make it?

Ans. In order to aid my memory in recalling the machines or appliances shown me by Daniel Drawbaugh.

Cross-Q. 282. How long since did you leave your home to come here to give this deposition?

Ans. I left home on Sunday, December 3.

Cross-Q. 283. Did you arrive here that Sunday night, or on Monday, December 4?

Ans. I arrived here on Sunday night at about eight o'clock.

Cross-Q. 284. And were here continuously from that time until you commenced giving your deposition, on December 9, were you?

Ans. I was.

Cross-Q. 285. During that time you had frequent conversations with complainants' representatives with respect to your knowledge of the facts of this case; had you not?

Ans. I had.

Cross-Q. 286. Do you know why the complainants sought you out so early in the history of this case, as a desirable person to confer with for their purposes?

Ans. I do not; I can ascribe no motives for the doings of anyone other than myself.

Cross-Q. 287. Have you never suspected that it was because of your supposed personal hostility to Daniel Drawbaugh?

Ans. I have not, inasmuch as I never intimated to any of them that I entertained feelings of hostility; neither do I.

Cross-Q. 288. Have you never intimated to anybody that you felt hostile to Daniel Drawbaugh; think carefully before answering?

Ans. I have; I might add that I have spoken very plainly, and more so to Daniel Drawbaugh himself than to anyone else.

Cross-Q. 289. When did you last intimate such disposition towards him, so far as you can remember; I mean, in speaking to him or to anyone else?

Ans. I had a controversy with him during the time of taking depositions in his behalf, during the faucet interference; but have not since met him on other than friendly terms, and we have met frequently since.

Cross-Q. 290. Am I to understand from your 287th answer that you now feel personally friendly to Daniel Drawbaugh?

Ans. That is the meaning I mean to convey.

Cross-Q. 291. When was the faucet interference declared between the application of yourself and the application of Daniel Drawbaugh in the Patent Office?

Ans. I do not know the exact date; I think it was some time in April, 1879.

Cross-Q. 292. Did you testify as a witness in your own behalf in that interference?

Ans. I did.

Cross-Q. 293. How many times; I mean how many depositions did you make in your own behalf in that interference?

Ans. I think two, exclusive of the preliminary statement.

Cross-Q. 294. The final judgment of the Patent Office was in favor of Daniel Drawbaugh, as the prior inventor of the faucet in controversy, was it not?

Ans. It was.

Cross-Q. 295. The first decision made in that interference was made by the Examiner of Interferences in favor of Daniel Drawbaugh, was it not?

Ans. It was.

Cross-Q. 296. Did you appeal from that decision to the Board of Examiners in Chief?

Ans. I did.

Cross-Q. 297. When your appeal came up for hearing before the Board of Examiners in Chief, they also decided in favor of Daniel Drawbaugh, did they not?

Ans. They did.

Cross-Q. 298. Did you appeal from their decision to the Commisioner of Patents, in person, as the law provides may be done?

Ans. I did not.

Cross-Q. 299. Then you accepted the decision of the Board of Examiners in Chief as the final decision in the case, and made no further objection in the Patent Office to the issuing of a patent to Daniel Drawbaugh, did you?

Ans. I did.

(Respondents' counsel offers in evidence as "Exhibit Patent Office Judgment No. 1," a certified copy from the records of the Patent Office, of the decision of the Examiner of Interferences, dated November 18, 1879, in the matter of the interference, Hauck *vs.* Drawbaugh, for improvement in measuring faucets.

Also as "Exhibit Patent Office Judgment No. 2," a certified copy from the records of the Patent Office of the decision of the Examiner-in-Chief, dated on the back January 15, 1880, in the matter of the interference, David A. Hauck *vs.* Daniel Drawbaugh, for improvement in measuring faucets, and asks to have them copied at length here in this deposition.

[*Objected to by Mr. Storrow, as immaterial and incompetent.*]

EXHIBIT PATENT OFFICE JUDGMENT NO. 1.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE.

To all Persons to whom these Presents shall come, greeting:

This is to certify, that the annexed is a true copy from the Records of this office of the Decision of the Examiner of Interferences in the matter of the Interference

Hauck *vs.* Drawbaugh
for
Improvement in Measuring Faucets.

In testimony whereof, I, V. D. Stockbridge, Acting Commissioner of Patents, have caused the seal of the Patent Office to be affixed this ninth day of December, in the year of our Lord, one thousand eight hundred and eighty-two, and of the Independence of the United States the one hundred and seventh.

Seal.

V. D. Stockbridge,
Acting Commissioner.

IN THE U. S. PATENT OFFICE.

In Re Interference
Hauck
vs.
Drawbaugh.
"Measuring Faucet."

Before the Examiner
of
Interferences.

The issue involved is defined as follows: "In combination with the ro-"tating piston and its actuating shaft, a crank arm attached to said shaft "and having its pin working in a bearing in the piston whereby the piston "is rotated."

It is shown that Drawbaugh has made several inventions, some of which he has patented. Among his patented inventions was a measuring faucet, manufactured and sold by Hauck for some years back. Among his unpatented ones was a rotary blower, made by him in 1870, and which eventually went to the shop of Samuel Hauck, brother of David Hauck, one of the contestants.

The faucet here in issue is undoubtedly made upon the principle of that blower.

Immediately upon the making of the blower, Drawbaugh saw that its principle could be applied to a rotary measuring faucet. Exhibit C, filed by him, embodies the issue, and it is shown clearly that it was made immediately upon the occurrence of the thought that the blower principle could be applied to faucets; this was sometime in 1870.

It is clearly shown that in 1877 he made exhibit D, which also embodies the issue. That he delayed doing anything more than make models and explain his invention because of his inability to persuade anyone with the necessary capital to go in with him and develop and put upon the market his invention. That finally in November or December, 1878, he persuaded Messrs. Moffitt and Chellis to extend him the necessary aid, whereupon he and they commenced the manufacture of the faucet. He applied for a patent January 14, 1879.

The earliest date Hauck sets up, even for conception of the subject matter of the issue, is November 18, 1878. He applied for a patent January 17, 1879.

Of course, prior to his earliest date, no question of comparative diligence could arise. Drawbaugh could only be called to account for lack of diligence after Hauck entered the field; there could be no race between the parties till then. Drawbaugh coming to the office first, lack of diligence cannot be imputed against him.

It is clear, as stated, that Drawbaugh had made, exhibited, and tested working models before Hauck alleges that he conceived of the invention.

In fact, upon the record presented, there is warranted the finding that Hauck never made the invention. Hiram Drawbaugh had seen sketches of the invention of his uncle Daniel, the contestant. In December, 1878, Hiram went to work for Hauck; he explained his uncle's new faucet to Hauck; thereafter Hauck got up sketches. This is clear from the testimony of Hauck and Hiram, called by him as a witness. A postal card is put in by Drawbaugh as his exhibit M, dated Mechanicsburg, [Hauck's residence,] Dec. 9, 1878, reading as follows:

"D. Drawbaugh,

"Sir:

"Hiram tells me you have made a new faucet. We "should like to see it; send or bring it up soon. Yours, &c.,

Haucks."

Hauck denies having written it. A comparison of it with writing which is confessedly his own, leads only to one conclusion, that he did write it. Hence, that his knowledge of the invention in issue was derived directly or indirectly from his opponent, Drawbaugh.

Priority of invention, as to the matter here in view, is awarded Daniel Drawbaugh.

Z. F. Wilbur,
Examiner of Interferences.

Nov. 18, 1879.
Exd., A. N.

EXHIBIT PATENT OFFICE JUDGMENT NO. 2.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE.

To all Persons to whom these Presents shall come, greeting:

This is to certify that the annexed is a true copy from the Records of this Office, of the Decision of the Examiner-in-Chief, in the matter of the Interference

David A. Hauck *vs.* Daniel Drawbaugh,
for
Improvement in Measuring Faucets.

In testimony whereof, I, V. D. Stockbridge, Acting Commissioner of Patents, have caused the Seal of the Patent Office to be affixed, this Ninth day of December, in the year of our Lord one thousand eight hundred and eighty-two, and of the Independence of the United States the one hundred and seventh.

Seal.

V. D. Stockbridge,
Acting Commissioner.

No. 5713. U. S. PATENT OFFICE, *January* 13, 1880.

Before the Examiners-in-Chief, an appeal.

In the matter of the interference between the application of David A. Hauck, filed January 17, 1879, and the application of Daniel Drawbaugh, filed January 14, 1879.

Impd' Measuring Faucets.

The matter in contest is expressed in the following claim:

"In combination with the rotating piston and its actuating shaft, a crank arm attached to said shaft and having its pin working in a bearing in the piston, whereby the piston is rotated."

It is not necessary for us to go into a full review and analysis of the evidence in this case.

Sufficient to say that his own witness, H. K. Drawbaugh, introduced to prove invention on the part of Hauck, and who swears to his having been shown rough sketches showing the invention on the 4th or 5th of December, (1878,) states, on his cross-examination, that on the same day and *before* Hauck made such sketches, he, witness, told him that Drawbaugh, on Sunday, the 1st of December, had told him of a faucet he was going to make with a circular chamber, and witness had made a sketch of it to explain it to Hauck, and it was just like what Hauck sketched, with only a slight difference in the "bar" or "abutment," which is not material in this matter.

In fact, if this witness is to be credited, and being his own witness, it is very difficult for Hauck to discredit him, the device in controversy was fully disclosed and described to Hauck on said occasion as the invention of Drawbaugh, and from such disclosure and description he was enabled to make the sketch which he now claims as the first reduction to form by himself of the invention.

There is abundant evidence besides that Drawbaugh had made this invention prior to this time as an improvement on a faucet he had patented, and which Hauck was manufacturing.

To fully corroborate this statement of his own witness, we find a postal made Exhibit "M" of Drawbaugh's exhibits—which is postmarked at Mechanicsburg, the residence of Hauck, December 8, and addressed to Drawbaugh, and the communication is as follows:

"MECHANICSBURG, December 7, 1878.

D. Drawbaugh,
Sir,

Hiram tells me you have made a new faucet; we should like to see it; send or bring it up soon.

Yours, etc.,
Hauck."

This "Hiram" is the witness H. K. Drawbaugh, and though Hauck denies having written the card, and all knowledge of it, yet it is proved to be in his handwriting, and a comparison with his acknowledged signatures appearing on papers in his application, seems perfectly conclusive that the card was written by him.

We are, therefore, constrained to find that Drawbaugh is the only inventor of the matter in contest, and we affirm the decision awarding him priority.

R. L. B. Clarke,
H. H. Bates, Examiners-in-Chief.

Cross-Q 300. I have in my hand a printed pamphlet of eighty-four pages, with a yellow paper cover, entitled on the cover as follows:

"Before the Commissioner of Patents, in the Matter of the Interference Between the Application of David A. Hauck for Improvements in Measuring Faucets, and the Application of Daniel Drawbaugh for a Similar Invention.

Testimony in behalf of David A. Hauck, In Chief and In Rebuttal.

Mechanicsburg, Pa.; Independent Journal Print., 1879."

Please look at this pamphlet and state whether it is a printed copy of the testimony taken in your behalf in the interference above mentioned, as printed for use in the Patent Office in accordance with the requirements of the Patent Office rules and regulations.

Ans. It is.

Cross-Q. 301. It is one of the copies which you yourself had printed for use in the Patent Office in the said interference, is it not?

Ans. It is.

(Respondents' counsel puts in evidence as "Exhibit Hauck Interference Deposition No. 1," a copy of the deposition of David A. Hauck, printed in the pamphlet last above referred to on pages 31 to 56 thereof, inclusive.

Also as "Exhibit Hauck Interference Deposition No. 2," a copy of the deposition of David A. Hauck, printed in the same pamphlet on pages 66 and 80, inclusive.

But respondents' counsel does not offer either of said depositions as evidence of any matter stated in them, and does not admit any statement contained in them to be true; but offers them merely to prove, as a fact, what it was that the witness *testified to* in said interference, in order that his testimony may be compared with the official judgment of the Patent Office, with reference to it and to the character of the witness as shown by the two exhibits "Patent Office Judgment No. 1" and "Patent Office Judgment No. 2" hereinabove put in evidence.

Complainants' counsel objects, that it is not competent to introduce statements made by the witness upon an entirely collateral matter, simply for the purpose of contradicting them, or showing that they are erroneous; that it is not competent nor proper to encumber this case with collateral inquiries which involve, among other things, an inquiry into the merits of the faucet case, and the means resorted to by the parties thereto, including Mr. Drawbaugh and Mr. Chellis, to sustain the issues therein; and that the papers being introduced by the respondents, they may be used for any purpose for which they may be legally competent.

Respondents' counsel states that he fully agrees with complainants' counsel, that it is not competent here to inquire anew into the merits of the faucet case, but he submits that, inasmuch as complainants' counsel introduced the subject of that interference into this deposition, by his seventy-second question, it is competent for respondents' counsel to cross-examine fully upon it, and to show what the decisions in the interference case were, and how they involved a judicial or official finding affecting the character of this witness.

And it is competent, inasmuch as both of the decisions aforesaid comment directly upon the testimony of this witness in that case, for respondents' counsel to show what said testimony of the witness was, by producing copies of his depositions referred to in said official decisions. Respondents' counsel does not pro-

pose to enter upon any inquiry into the facts involved in said interference, as all that matter was finally determined by the judgment of the Patent Office.

Referring to the last remark in the objection of complainants' counsel, respondents' counsel calls attention to the fact that complainants' counsel have heretofore in this case, put in evidence the entire testimony taken on behalf of Drawbaugh in said interference.

Complainants' counsel says that his objection does not bear the meaning imputed to it by the first part of the preceding remarks.)

Cross-Q. 302. Please look at the two depositions which I have put in evidence, and state whether you are the David A. Hauck who made those depositions at the times and in the manner therein stated.

Ans. I am.

Cross-Q. 303. Did you ever have any other interference in the Patent Office with Daniel Drawbaugh, except the one referred to?

Ans. I did not.

Adjourned until December 13, 1882, at ten, A. M.

DECEMBER 13, 1882, ten, A. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Cross-examination of David A. Hauck, by Mr. Hill, continued:

Cross-Q. 304. Those two depositions "Exhibit Hauck Interference Deposition No. 1" and "Exhibit Hauck Interference Deposition No. 2" were filed and used as evidence on your behalf on the interference; were they not?

Ans. They were.

Cross-Q. 305. I wish to call your attention to the following extract from "Exhibit Hauck Interference Deposition No. 1," the same being your deposition in the direct evidence taken in your behalf, my extract consisting of that part of said deposition from cross-question 123 to cross-answer 133, inclusive, as follows:

"*Cross-Q.* 123. What brought Mr. Daniel Drawbaugh to your shop "on that occasion?

"*Ans.* 123. I can't say positively; I could merely guess.

"*Cross-Q.* 124. We will admit your guess.

"*Ans.* 124. I believe he came there to see my new faucet, or learn "how it was constructed, because I believe that H. K. Drawbaugh on the "Sunday previous told him that I was making a new measuring faucet "and partially explained it to him.

"Adjourned at twelve, M., to meet at two o'clock, P. M.; hearing re-"sumed; parties and their counsel all present. D. A. Hauck on the "stand.

"*Cross-Q.* 125. Then you did not send for Daniel Drawbaugh to come "to see you?

"*Ans.* 125. I did not.

"*Cross-Q.* 126. You are sure of that?

"*Ans.* Quite sure.

"*Cross-Q.* 127. You are sure that you did not send for him at any "time previous to the visit of J. B. Drawbaugh to your shop?

"*Ans.* 127. Not during a month previous, but I do not know that I "sent for him at all.

"*Cross-Q.* 128. Did you not send him word that you had heard he "was making a new faucet and that he should come to see you and bring "it with him, or send it?

"*Ans.* 128. No, sir.

"*Cross-Q.* 129. Then you never authorized anyone to deliver such a "message to him?

"*Ans.* 129. I never did.

"*Cross-Q.* 130. Nor to write to him to that effect?

"*Ans.* 130. I never did.

"*Cross-Q.* 131. And you did not write yourself to that effect?

"*Ans.* 131. I did not.

"*Cross-Q.* 132. Did any one of your partners write to him to that "effect with your knowledge?

"*Ans.* 132. Not with my knowledge or consent.

"*Cross Q.* 133. You have answered all these questions very positive-"ly, and you are entirely certain that no such message was ever written "or sent by you, or by anyone else at your instance or with your knowl-"edge?

"*Ans.* 133. I am."

Also to the following extracts from the Exhibit Hauck Interference Deposition No. 2, the same being your rebutting deposition in said interference, the first extract consisting of questions and answers five to eight inclusive, as follows:

"*Q.* 5. At the hearing in Harrisburg spoken of, Daniel Drawbaugh "produced a postal card which was marked letter "M" and testified that "it was from you, state if you please whether that is true or not.

"*Ans.* 5. I have no recollection whatever of ever writing such a "message to Daniel Drawbaugh.

"*Q.* 6. State if you please whether or not you ever authorized any-"body to write that postal card for you.

"*Ans.* 6. I did not.

"*Q.* 7. State if you please whether or not you examined the writing "of that postal card.

"*Ans.* 7. I did hurriedly.

"*Q.* 8. State if you please whether or not upon the examination you "gave it you recognize it as being in your handwriting.

"*Ans.* I did not, although it is somewhat similar."

The second extract consists of cross-questions and answers one and two as follows:

"*Cross-Q.* 1. You were asked by Mr. Ritner in question No. 5, "whether what Daniel Drawbaugh testified to with regard to the postal "card marked "M" namely, that it was from you, was true or not and "you answered that you had no recollection whatever of ever writing "such a message to Daniel Drawbaugh, do you undertake to swear that "you never wrote that postal card?

"*Ans.* 1. I can only swear that I have no recollection of it whatever, "from the fact that at the date which appears upon that postal card, I "had no knowledge which would lead me to write such a message, and "furthermore, the card is signed simply "Haucks," and I am quite positive that I never signed any message in that way.

"*Cross-Q.* 2. Then you are prepared to swear, notwithstanding the "testimony of Harmon K. Drawbaugh in this case, that you had no "knowledge on the 9th of December, 1878, of the invention of a new "measuring faucet by Daniel Drawbaugh?

'*Ans.* 2. I am."

The third extract is contained in cross-questions 13, 14, and 15, as follows:

"*Cross-Q.* 13. Do you still swear that the first knowledge you had "that Daniel Drawbaugh was at work on a new faucet, was obtained "after the visit of J. B. Drawbaugh to your shop in December last?

"*Ans.* 13. I do.

"*Cross-Q.* 14. You have said that you examined the handwriting "upon the postal card; are you prepared to swear that it is not your "handwriting?

"*Ans.* 14. I am.

"*Cross-Q.* 15. Can you tell whose handwriting it is?

"*Ans.* 15. I cannot."

The fourth extract commences at cross-question 31, and is as follows:

"*Cross-Q.* 31. Then, notwithstanding that you do not believe that the "postal card was written by any member other than yourself of any of "the Hauck firms in Mechanicsburg, and that you admit that there is a "similarity between the handwriting upon it and your handwriting, you "are prepared to swear that you did not write it?

"*Ans.* I am.

"*Cross-Q.* 32. You are certain of that?

"*Ans.* 32. Quite certain.

"*Cross-Q.* 33. And as certain as that Daniel Drawbaugh did not make "a sketch of his faucet for you in the presence of J. B. Drawbaugh last "October?

"*Ans.* 33. I am.

"*Cross-Q.* 34. And as, that Harmon K. Drawbaugh did not tell you "about Daniel Drawbaugh's faucet, on the 4th or 5th of December last?

"*Ans.* 34. Yes, sir.

"*Cross-Q.* 35. And as, that he did not make the chalk sketch upon "the work-bench which he testified to at any time prior to the visit of "Daniel Drawbaugh to your shop on his return from his father's funeral

"*Ans.* 35. Yes, sir.

"*Cross-Q.* 36. And as, that Daniel Drawbaugh did not at that visit " tell you that the faucet you were working on was his?

"*Ans.* Yes, sir.

"*Cross-Q.* 37. And as, that on the occasion of your visit to the shop "of Daniel Drawbaugh on the fifteenth of January, 1879 you did not "tell your partner, Samuel F. Hauck that you had not spoke to Daniel "Drawbaugh about his "faucet" that you didn't care about saying "anything to Daniel Drawbaugh at the time about his new faucet?

"*Ans.* 37. Yes, sir.

" *Cross-Q.* 38. And you are as certain that you did not write that " postal card as you are of any other fact to which you have testified in "this case.

" *Ans.* 38. Quite as certain as to some, but not as to all.

" *Cross-Q* 39. Then you are not entirely certain of it?

"*Ans.* 39. As certain as it is possible to be of an event that might "have occurred as long ago as that.

"*Cross-Q.* 40. Then you are prepared to admit that you might have "written it and forgotten it?

"*Ans.* No, sir; for the reason that I did not possess the knowledge "at that time that the postal card conveys.

"*Cross-Q.* 41. And that is the reason why you say you did not write "it, notwithstanding the admitted similarity between the handwriting on "the postal card and your own?

"*Ans.* 41. Not the only reason.

Cross-Q. 42. What other reasons have you?

"*Ans.* 42. I have already answered that I am quite positive that I "never signed any message or postal card "Haucks".

"*Cross-Q.* 43. Are those the only reasons?

"*Ans.* 43. I have no recollection of writing the card, without giving "any reasons for my conviction.

"*Cross-Q.* 44. Are you prepared to swear that you could not have "signed the word "Haucks" to a postal card or any message six months "ago and forgotten it?

"*Ans.* 44. I don't think I could have forgotten such an unusual man- " ner of signing a message during this short time that has elapsed."

It would appear from the above quotations that the counsel in the interfence case very carefully and repeatedly called your particular attention to said postal card; is not such the fact?

Ans. It is.

Cross-Q. 306. Did you not conduct that interference case upon the theory that Drawbaugh stole the faucet invention from you?

Ans. I did not.

Cross-Q. 307. Your rebutting deposition in the Exhibit Hauck Interference Deposition No. 2, purports to have been taken on the sixteenth and seventeenth days of July, 1879; such is the fact is it not?

Ans. It is.

Cross-Q. 308. I call your attention to your first and second answers in said rebutting deposition as follows:

"*Ans.* 1. It is not, as I am very certain that I was not at Daniel "Drawbaugh's shop during the fall and winter of 1878 and 1879, prior "to the 15th of January, 1879.

"*Q.* 2. How long prior to the 15th of January, 1879, was it that you "were there?

"*Ans.* 2. I can't say positively but have no recollection of being "there during the year 1878 at all."

Do you think your recollection was as good in the summer of 1879 in regard to whether you were or were not at Drawbaugh's shop in the year 1878, as it is now, more than three years later?

Ans. It was not.

Cross-Q. 309. Your memory then, is of a kind which strengthens by lapse of time, is it?

Ans. It is not, but at that time I did not expect to be asked those questions and was obliged to answer them on the spur of the moment, without due reflection. But prior to coming here to make this deposition I have thought over these occurrences, and my recollection of them is somewhat clearer now than it was then.

Cross-Q. 310. At the time when you commenced to testify in this suit, did you expect to be asked about the dates of your visits to Drawbaugh's shop, in company with Mr. Plank?

Ans. I cannot say that I expected to be asked particularly about my visits there with Mr. Plank, but I did expect to be questioned concerning all of my visits there.

Cross-Q. 311. State the earliest time at which you remember seeing a magnetic clock at Daniel Drawbaugh's shop at Eberly's Mills?

Ans. I saw a magnetic or electric clock on the occasion of my first visit.

Cross-Q. 312. State the earliest time at which you had any knowledge of a clock there connected by wires with plates buried in the ground.

Ans. I think not before the winter of 1874 and '5, although Daniel Drawbaugh and I may have conversed in regard to propelling a clock by an earth battery prior to that.

Cross-Q. 313. If there had been such a clock there as early as the year 1873, would you have seen it?

Ans. I think I would.

Cross-Q. 314. How certain are you about that—whether you would or not?

Ans Reasonably certain from the fact that I felt more interested in his experiments on that particular clock, than in most of his other experiments, and I believe he would have communicated the completion of the clock to me on the first opportunity, although I may not be correct in the date.

Cross-Q. 315. From your greater interest in that magnetic clock invention, do you think you would have been more likely to remember the fact of having seen it than to remember the fact of having seen other inventions in which you were less interested?

Ans. I think I would.

Cross-Q. 316. If you had seen it there in 1873, then, you would be able now to remember the fact, would you?

Ans. Not positively as to the time, but reasonably certain as to seeing it soon after its completion.

Cross-Q. 317. Mr. Theophilus Weaver, a witness examined in this case on behalf of the complainants, has testified that he visited that shop of Daniel Drawbaugh in the year 1873, and that that magnetic clock with the wires running to plates buried in the ground was there then and was seen by him at the time of that visit, and that he had heard of it previously, and made the visit expressly to see it; do you know of any reason for doubting the truth of his testimony on this point?

Ans. I have no reason to doubt the truth of his statement, and will concede that it might have been as early as November or December of 1873 that I first saw it.

Cross-Q. 318. Might that clock not have been there as early as your first visit to Drawbaugh's shop in June, 1873?

Ans. I am positive it was not.

Cross-Q. 319. Are you as positive of that fact as you are that you did not see speaking telephones there in 1873?

Ans. I am not, inasmuch as there was at least one form of electric clock there, but no speaking telephone in any form.

Cross-Q. 320. Do you mean to testify that there was no speaking telephone, in any form, there in 1873, or merely that you did not see any, or hear of any?

Ans. I mean that I did not see or hear of any.

Cross-Q. 321. And after all that took place in the faucet interference, in the taking of the testimony, and the decisions in the case, are you again prepared to say, under oath, that you remain entirely friendly to Daniel Drawbaugh?

Ans. I am.

Recess for lunch until 2.15, P. M.

DECEMBER 13, 1882, 2.15, P. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Cross-Q. 322. I have been informed that a good deal of the time, while you superintended the shop at Eberly's Mills, you used to lie around the shop asleep, and sometimes had to be waked up, even to take the train for Mechanicsburg to return home, towards evening; is my information correct, or have you any recollection about the matter?

Ans. It is unqualifiedly false.

Redirect by Mr. Smith:

Q. Q. 323. In your answer to the 168th cross-interrogatory, you mentioned the fact that you sold a drill-press to E. W. Chellis, of Harrisburg, about a year ago; have you had any other dealings with Mr. Chellis, and if so, state what they were and when and where they took place?

(Objected to by Mr. Hill, as immaterial and as new matter not referred to on cross-examination.)

Ans. I also sold him an incomplete turning lathe at the time of selling him the drill-press, and a year or a year and a half previous to that sale, I sold him a complete engine lathe, which we had used in the manufacture of faucets. The transactions occurred in Mechanicsburg, either at the shop of Hauck and Comstock, or the store of G. W. Hauck.

Q. Q. 324. How many times did he see you in relation to these several purchases?

Ans. Certainly four, and probably five times.

Q. Q. 325. Did he or not, at any of these interviews, make any inquiry of you as to what you knew in relation to the invention or use of the telephone by Mr. Drawbaugh? If so, state what it was?

Ans. He did once during a visit; he asked me very bluntly whether I ever saw a telephone at Dan's shop; I answered him that I did not; that was all the conversation that took place in regard to it.

Q. Q. 326. You have been inquired of, in the cross-examination, about a man called Weeks, who talked with you about what you knew in relation to the invention or use of the telephone by Daniel Drawbaugh; and in the 290th cross-interrogatory you were asked if you knew why the complainants sought you out so early in the history of the case as a desirable person to confer with for their purposes. How did you first become acquainted with this man Weeks?

Ans. I was introduced to him either by M. W. Jacobs, Esq., or E. W. Chellis, at a Granger's picnic some time before he approached me on the subject of my knowledge of Drawbaugh's invention of the telephone.

Q. Q. 327. During the cross-examination you produced a paper containing a list of things which you had seen at Drawbaugh's shop. Have you, since you produced that paper, thought of anything else that you saw there which is not on that list, and which did not occur to you when you made it up? If so, will you state what it was and when it came back to your memory?

Ans. I have; I also saw what is called a gas-governor, which recurred to my memory during the controversy about the reading of the list I produced.

Q. Q. 328. Two depositions have been introduced in evidence by the respondents. Do you remember whether or not you were cross-examined when you gave those depositions by Mr. M. W. Jacobs, who has been present on behalf of the respondents, as you understand it, during the taking of your present deposition?

Ans. I was cross-examined by the gentleman mentioned.

Q. Q. 329. I wish to call your attention to some questions proposed by Mr. Jacobs on that occasion and your answers thereto.

His third cross-interrogatory, referring to Mr. Drawbaugh, is this:

"He is a machinist, is he not?" and you answered, "That is one of the trades he is proficient in."
"*Cross-Q.* 4. Then he is a man of versatile talents, is he?
"*Ans.* 4. He is.
"*Cross-Q.* 5. And a born inventor, is he not?
"*Ans.* 5. That I cannot say, as I have only known him for about ten "years."

This opinion that you expressed as to his versatile talents was an opinion that you really held at that time, notwithstanding your controversy with him, was it not?

Ans. I certainly did.

Q. Q. 330. These questions were followed by others:

"*Cross-Q.* 6. You are aware, however, that he has made a great many "useful and ingenious inventions, are you not?
"*Ans.* 6. What he has made since I have become acquainted with him, "that I have any knowledge of, I would call imitations, although some "of them might be patentable.
"*Cross-Q.* 7. To what inventions do you refer?
"*Ans.* 7. I refer to the blower spoken of in this controversy; also, to "an automatic boiler-feeder, and to a magnetic clock, and to a steam "syphon or a steam pump, and a hydraulic ram; that is all I can think "of at present."

Was the opinion which you have expressed in the first of these answers one which you really entertained at that time in respect to all of Mr. Drawbaugh's inventions which were then present to your mind?

Ans. It was.

Q. Q. 331. Mr. Jacobs proceeded to call your attention to another invention of Mr. Drawbaugh's, which, he apparently thought, might not come within the class of imitations, as follows:

"*Cross-Q.* 8. Mr. Drawbaugh also invented a measuring faucet, did he "not, the patent upon which you subsequently purchased?
"*Ans.* 8. He did.
"*Cross-Q.* 9. Was that an imitation, too?
"*Ans.* 9. It was to a great extent."

I suppose you really entertained that opinion at that time?

Ans. I did.

Q. Q. 332. Mr. Jacobs proceeded to cross-examine you at some length as to the grounds of that opinion, if I understand it, and then asked you this question:

"*Cross-Q.* 28. Of what was his magnetic clock an imitation?
"*Ans.* 28. It is an imitation of a clock represented in either Knight's "or Appleton's Mechanical Dictionary—I don't remember which one— "which I saw during the time Mr. Drawbaugh was perfecting his clock.',

And the inquiries then proceeded as follows:

"*Cross-Q.* 29. While be was perfecting his clock, he told you about "his invention and his experiments upon it, did he not?
"*Ans.* 29. He did.
"*Cross-Q.* 30. Once, or more than once, did he talk to you?
"*Ans.* 30. He talked to me about it a great many times.
"*Cross-Q.* 31. Did he ever talk to you about any of his other inven- "tions?
"*Ans.* 31. He did.
"*Cross-Q.* 32. He was generally pretty free in communicating his ideas "to friends, wasn't he?

"*Ans.* 32. He was."

Were these answers which you gave to Mr. Jacobs at that time true?

Ans. They were.

Q. Q. 333. Mr. Jacobs then proceeded with a series of questions, some of them relating to the clock and some of them to a new faucet, inquiring particularly as to your knowledge of the clocks until he reached his 49th interrogatory, which is in these words:

> "*Cross-Q.* 49. But still you undertake to swear that Daniel Drawbaugh's clock was an imitation of the one you saw in the Mechanical "Dictionary?
>
> "*Ans.* 49. I do, so far as I am able to comprehend.
>
> "*Cross-Q.* 50. Don't you know that Daniel Drawbaugh was at work on "his clock for about ten years, and perfected it step by step?
>
> "*Ans.* 50. I do not know that.
>
> "*Cross-Q.* 51. You emphasize the words, "know that;" how long, to "your knowledge, was he at work on it?
>
> "*Ans.* 51. The earliest that I can remember was about the year 1874 "or 1875, and I believe, only from what I heard, that he completed it "about two years ago."
>
> "*Cross-Q.* 52. And you undertake to swear that Daniel Drawbaugh is "an imitator, and not an original inventor?
>
> "*Ans.* 52. I believe him to be an excellent imitator, while I do not say "that he could not be called an inventor."

You seem to have entertained the belief that Mr. Drawbaugh was an imitator in respect to the inventions he made, notwithstanding all which Mr. Jacobs could suggest to you at that time; was that so?

[*Objected to by Mr. Hill, because the quotation made by complainants' counsel is not sufficiently full to show to the Court the exact character of the testimony of the witness, who was forced, by the questions immediately preceding the forty-ninth question, in same deposition, to admit that he was giving his opinion as to Drawbaugh's clock being an imitation of a prior clock, while he could not tell whether the magnetic power was applied in a similar manner in the two clocks, nor could he claim to possess a complete knowledge of the construction of them.*

Complainants' counsel replies that he expects the Court to read all the testimony which the defendants have put into the case, bearing upon this subject.

Respondents' counsel asks why in that case complainants' counsel is getting the witness to repeat certain portions of it, and only suggests that if there is any object in having portions of *it repeated, such portions be taken fully enough to represent the testimony on that point correctly.*

Counsel for the complainants replies that he hasn't asked the witness to repeat any portion of the testimony, but that he has himself repeated as much of it as he thinks necessary to insure the attention of the Court to the whole of it.]

Ans. It was.

Q. Q. 334. If you had known when you were thus cross-examined by Mr. Jacobs that Daniel Drawbaugh had invented the speaking telephone before 1876, would you have thought that he was a mere imitator, or that all his inventions were only imitations of prior inventions made by other people?

[*Objected to by Mr. Hill, as leading and hypothetical.*]

Ans. If I had known that he had invented or constructed a speaking telephone prior to 1876, I would certainly have regarded it as new and startling.

Q. Q. 335. Do you remember whether Daniel Drawbaugh was present during this cross-examination in the interference and in consultation with Mr. Jacobs?

Ans. He was present nearly all the time of taking the entire testimony, but I cannot say positively that he was there at the time specified.

(Counsel for complainants calls the attention of the witness to a memorandum between the 16th and 17th answers of his deposition No. 1, dated at the beginning of the session during which the cross-examination above referred to took place, as follows:

"Hearing resumed Monday June 2, 1879, at 2, P. M.

"Parties and their counsel all present."

And asks him whether this memorandum aids his recollection upon the subject. Witness continues:)

I can say that Mr. Drawbaugh sometimes went out for a few moments, and notwithstanding the statement that he was there at the opening of the session, it is not conclusive to me that he was there at the time specified, although I am positive he was there when Mr. Jacobs asked me what was the name of the clock I saw in the Mechanical Dictionary, for at that time Mr. Drawbaugh whispered the name "Bain's" to Mr. Jacobs, loud enough for me to hear.

Re-Cross by Mr. Hill:

Re-Cross-Q. 336. Complainant's counsel, in his 330th redirect interrogatory, has called your attention, among other things, to the answer which you made to cross-question 7, of your "Interference deposition, No. 1," in which you mentioned Drawbaugh's blower, automatic boiler-feeder, magnetic clock, steam syphon or steam pump and hydraulic ram, as all the inventions which you could, at that time, think of, that he had made, that you had any knowledge of, since you became acquainted with him. Was your said answer to said cross-interrogatory 7 true or untrue?

Ans. It was true. I will qualify that by adding, so far as my memory served me at the time.

Re-Cross-Q. 337. In your 13th answer in the deposition now taking in this suit, you have mentioned several inventions that you did not think of in giving your 7th cross-answer, in that interference deposition, No. 1, to wit: A pump to supply boilers with water, a machine for insulating wire for telegraph purposes, two stamp cancellers, and a nail-plate feeding machine or appliance, have you not?

Ans. I have.

Re-Cross-Q. 338. Your 7th cross-answer in the interference deposition, No. 1, thus enumerates five of Drawbaugh's inventions which you then remembered, and fails to enumerate five others, which you testified to in your 13th answer in this case. Is not that the fact?

Ans. It is.

Re-Cross-Q. 339. It also failed to enumerate the gas governor, to which you referred in your 327th redirect answer in this case, did it not?

Ans. It did.

Re-Cross-Q. 340. It also failed to enumerate the apparatus for telegraphing by means of a horse-shoe magnet without a battery, referred to in your 34th, 46th, 47th, 48th, 49th, 50th, 51st, 52d, 53d, and 54th answers in this case; did it not?

Ans. I believe it did, although I cannot remember whether or not the magnet telegraph was mentioned in the answers named.

Re-Cross-Q. 341. It also failed to enumerate the automatic fire-alarm mentioned in your 55th answer and elsewhere in your deposition in this case; did it not?

Ans. It did.

Re-Cross-Q. 342. It also failed to enumerate the rag-carpet instrument mentioned in your 57th answer in this case; did it not?

Ans. It did.

Re-Cross-Q. 343. It also failed to enumerate the telegraph instrument having a key-board with letters of the alphabet on the keys, mentioned in your 58th answer in this case; did it not?

Ans. It did.

Re-Cross-Q. 344. It also failed to enumerate the telegraph instrument having a dial, mentioned in your 58th answer in this case; did it not?

Ans. I think I did not allude to the latter instruments as certainly being distinct and separate machines, although I did not mention it in my 7th cross-answer in interference deposition No. 1.

Re-Cross-Q. 345. In your 7th cross-answer in the interference deposition referred to, you remembered to mention five of Daniel Drawbaugh's inventions, but forgot to mention ten or eleven of his other inventions which you now remember in giving this deposition; is not that the fact?

Ans. It is.

Re- ross-Q. 346. Don't you think that if you were to give another deposition four or five years hence, you might then remember even to have seen Drawbaugh's telephone during your superintendence of the faucet buiness at his shop?

Ans. Most certainly not.

Re-cross-Q. 347. Will you please describe Drawbaugh's magnetic clock that had the earth-plate connection? Describe it as it was when you first remember seeing it.

Ans. The portions of it which were different from ordinary clocks were the pendulum, the works or gearing containing no springs or drum for winding cord, and the pendulum was caused to vibrate by means of an electro-magnet fastened to the case behind and near the pendulum rod, by which the pendulum was attracted towards the magnet and repelled from it by means of an electric current generated by the earth-battery, which current was changed to favor the propulsion of the pendulum by means of completing and breaking the current near the point of suspension of the pendulum.

Re-cross-Q. 348. Give now the earliest time at which you are positive that you saw this clock at his shop in the condition in which you have described it.

Ans. I can give no date nearer than that I have already given.

Re-cross Q. 349. I want you to restate the date in this connection.

Ans. It might have been as early as November or December, 1873, and as late as the spring or summer of 1875.

Re-cross-Q. 350. But not later?

Ans. I think not.

Re-cross-Q. 351. You are sure that it was not so late as the time when you moved the machinery away in May, 1876, are you not?

Ans. Not sure, but think not.

Re-cross-Q. 352. You are sure that it was at least as early as the month of May, 1876, are you?

Ans. Reasonably certain.

Adjourned until December 14, 1882, at ten, A. M.

DECEMBER 14, 1882, 10, A. M.

Examination resumed, pursuant to adjournment.

Present, same counsel.

Cross-examination of David A. Hauck, by Mr. Hill, continued:

Re-cross-Q. 353. You have been asked in redirect examination very fully with reference to an opinion which you expressed while giving your interference deposition No. 1, to the effect that Daniel Drawbaugh was a mere imitator; it was for your interest in that interference to represent him to the Patent Office as a mere imitator, just as it is for the interest of the complainants here in this suit to represent him to the Court as a mere imitator, was it not?

Ans. Notwithstanding the effect it might have it was, nevertheless, and is yet an honest opinion.

[*Answer objected to by Mr. Hill as volunteered and not responsive.*

Counsel for the complainants calls attention of the counsel for respondents to the fact that the opinion in question was called out by Mr. Jacobs in his cross examination of the witness in the deposition in the interference case, which respondents have put in evidence in their present cross-examination.

Counsel for respondents replies that the opinion, nevertheless, was immaterial and incompetent in that case, and is immaterial and incompetent in this case; that the deposition was put in evidence in this case merely to give the Court an opportunity to compare what this witness swore to in that interference with what the Patent Office officially found to be the fact and the truth, notwithstanding his sworn denial of it; and that for the purposes of the last interrogatory and those which are about to follow, it makes no difference who drew the expression of opinion out of the witness in the interference case.]

Re-cross Q. 354. I did not ask you, nor do I care, whether the opinion was your honest opinion or not; but I leave the Court to judge of that.

What I asked you and what I wish to know is this: Whether it was not for your interest in that interference case, as it is for the complainants' interest here, to represent Daniel Drawbaugh as a mere imitator, and you will please answer whether such was the fact or not.

Ans. I cannot answer the question pointedly in its present shape, as it implies that I misrepresented Daniel Drawbaugh in my testimony in my interference deposition, which I do not admit.

[*Answer objected to by Mr. Hill, for the same reasons given in his objection to the last answer.*]

Re-cross Q. 355. The question, whether or not it was for your interest in that interference to represent him as a mere imitator, is entirely independent of the further question whether the representation was true or not. Now, without reference to its truth or falsity, I ask you again, whether it was not for your interest in that interference as it is for the complainants' interest here to represent him as a mere imitator?

[*Objected to by Mr. Storrow, for the reason that the question as to the character of Mr. Drawbaugh, as an inventor, and whether his inventions were original in their character, or in the nature of imitations of and improvements upon the work of his predecessors, was first introduced into the faucet case as an issue by Mr. Drawbaugh and his counsel, Mr. Jacobs, in the cross-examination referred to.*

Respondents' counsel replies that this objection has nothing to do with the question now put to the witness.]

Ans. It was.

Re-cross-Q. 356. Do you know when the first patent of Alexander Graham Bell, that is involved in this suit, was issued and dated?

Ans. I do not.

Re-cross-Q. 357. Then I will inform you that it was the 7th day of March, 1876. Assuming that to be the date, do you know of any knowledge that the world had of Alexander Graham Bell's invention prior to that date?

Ans. I do not to a certainty, although it occurs to me I had read an account of telephones, said to be the invention of Bell, Edison, or both, during the year 1875.

Re-cross-Q. 358. Your recollection, then, is a great deal more favorable to Mr. Bell and Mr. Edison than their own recollection, and far outruns any claim they have ever set up, besides being directly opposed